Scripps Research
Education & Training

Institutional Report for the

Reaffirmation of Accreditation





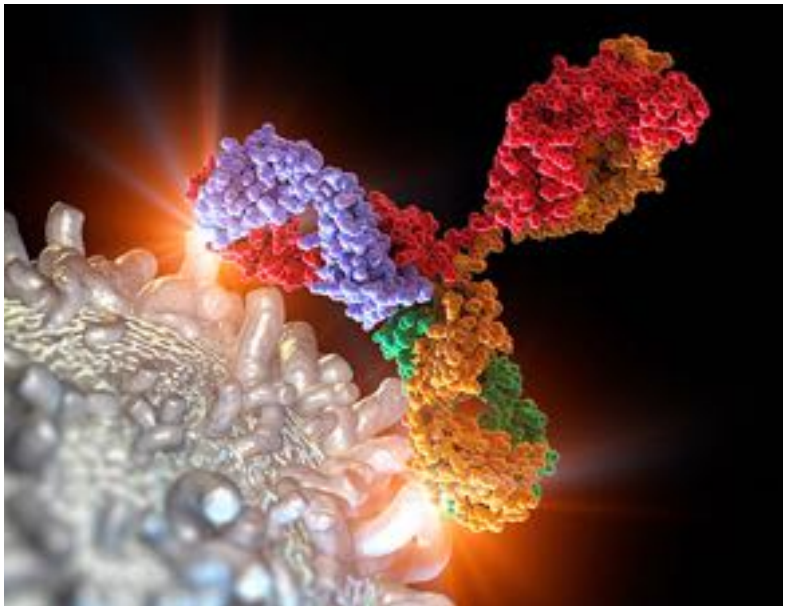




Table of Contents

1 Introduction: Institutional Context and Response to Previous Commission Action 5

1.1 History 5

1.2 Mission, Vision, and Values 6

1.3 One Institute, Two Campuses 6

1.4 Organizational Structure 7

1.4.1 Board of Directors 7

1.4.2 Governance 7

1.4.3 Leadership 8

1.4.4 Faculty 8

1.5 Doctoral Program in Chemical and Biological Sciences Overview 9

1.5.1 Graduate Program Leadership 10

1.5.2 Graduate Program Governance 10

1.5.3 Graduate Students 11

1.6 Response to Previous Commission 13

1.6.1 Strategic Planning 13

1.6.2 Program Review 13

1.6.3 Assessment of Student Learning 14

1.6.4 Diversity 14

1.6.5 Interaction with WSCUC 14

1.7 Preparation for WSCUC Reaffirmation of Accreditation 15

2 Compliance with WASC Standards, CFRs and Educational Effectiveness Indicators 16

2.1 Self-Review under the Standards and CFRs 16

2.1.1 Standard One 16

2.1.2 Standard Two 17

2.1.3 Standard Three 17

2.1.4 Standard Four 17

2.2 Inventory of CFRs and Educational Effectiveness Indicators 18

2.3 Institutional Strengths 18

2.4 Plan for Building Strengths and Addressing Challenges 18

3 Degree Programs: Meaning, Quality, and Integrity of Degrees 20

3.1 Meaning - What it Means to Have a Scripps Research Ph.D. 20

3.2 Quality - Structure of Program Offering 22

3.2.1 Career Outcomes 22

3.3 Integrity - Assessment to Ensure Objectives Being Met 23

4 Educational Quality: Learning Outcomes, Core Competencies, and Standards of Performance at Graduation 25

4.1 Program Learning Outcomes 25

4.2 Student Learning 25

4.2.1 Committee Meeting Rubrics 27
4.2.2 Candidacy Examination 28
4.2.3 Pre-Doctoral Fellowships 29
4.2.4 Dissertation 30

5 Student Success: Admissions, Student Support, Retention Rates, and Graduation Rates 32

5.1 Admissions 32
5.1.1 Bicoastal Admissions Committee and its Subcommittees 32
5.1.2 Admissions Review Process 33
5.2 Retention Rates 35
5.3 Graduation Rates 35
5.4 Support – Academic 35
5.4.1 Scripps Research Libraries 36
5.4.2 Career and Postdoctoral Services Office 37
5.5 Support – Social 38
5.5.1 Office of Graduate Studies 38
5.5.2 International Services Office 39
5.5.3 Student Organizations 39
5.6 Support – Health & Wellness 40

6 Quality Assurance Improvement: Program Review, Assessment, Use of Data 41

6.1 Program Review 41
6.1.1 Bicoastal Integration 41
6.1.2 Evaluation of Foundation Curriculum 41
6.1.3 Immunology Curriculum 42
6.1.4 Structural Biology Curriculum 44
6.1.5 Neuroscience Curriculum 46
6.1.6 Curriculum Taught by Florida Faculty 47
6.2 Evaluation of Professional Skills Development Curriculum 48
6.2.1 Effective Scientific Communication Course 49
6.2.2 Fellowship Boot Camp Course 50
6.2.3 Effective Career Planning for Ph.D.s Course 51
6.2.4 Introduction to Biostatistics Course 51
6.3 Evaluation of Skills Assessment Tools 51
6.3.1 Awareness and Adoption of IDPs. 51
6.3.2 Streamlining the IDP 52
6.4 Technology Enhancements 52
6.5 Institutional Research and Database Updates 52
6.6 Website Search Engine Optimization 53
6.6.1 Student Achievement Website 54

7 Sustainability: Financial Viability and Preparing for the Changing Higher Education Environment 55

7.1 Financial Viability 55
7.1.1 Sustainability 55
7.1.2 Increasing Revenues 56
7.2 Changing Higher Education Environment 57
7.2.1 Admissions Policies 57
7.2.2 Hungry and Homeless Students 57
7.2.3 Title IX Policy 58
7.3 Conclusion 58

8 Institution-Specific Theme(s) (Optional) 59

9 Conclusion: Reflection and Plans for Improvement 60

9.1 Meeting Student Needs. 60
9.2 Increase Fellowship Funds 60
9.3 Experiential Learning Opportunities 61
9.4 Alumni Engagement 61
9.5 Bicoastal Integration 61
9.6 Faculty Development 62
9.7 Gender Variations 62

Supporting Data and Documents 63

List of Tables 64
List of Figures 65
List of Criteria for Review 66
Standard 1: Institutional Purpose and Ensuring Educational Objectives 66
Standard 2: Educational Objectives through Core Functions 66
Standard 3: Developing and Applying Resources and Organizational Structure to Ensure Quality and Sustainability 68
Standard 4: Creating an Organization Committed to Quality Assurance, Institutional Learning and Improvement 69
List of Appendices 70
Glossary of Terms 71



1

INTRODUCTION: Institutional Context and Response to Previous Commission Action

While reading this report, supplemental data and documents are available for a more in-depth review of the various topics. The majority of the table and figure headings are hyperlinked to bring the reader to the online Tableau business intelligence system where the reader can select metric views based on demographics, campus, and academic year filters. A list of the tables, figures, Criteria for Review (CFRs), appendices, and glossary terms are also listed at the end of the document.

1.1 History

The Scripps Research Institute enjoys a rich history of academic and scientific achievement. Its world-class faculty and visionary leadership have partnered to create a top-ranked nonprofit biomedical research institute that translates discoveries into new medicines while training the next generation of scientists.

The roots of The Scripps Research Institute (Scripps Research) date back to 1924 when philanthropist Ellen Browning Scripps founded the Scripps Metabolic Clinic to diagnose, treat, and investigate diabetes and other disorders of metabolism. In very short order, the Clinic grew in scope. In the 1960s, the Institute recruited notable biochemists, microbiologists, and experimental pathologists. The 1980s brought an expansion of multiple research programs including cell and molecular biology and synthetic and bioorganic chemistry, while the 1990s saw a tripling of size and the further recruitment of eminent scientists and Nobel laureates.

Scripps Research's Graduate Program was established in 1989 and received initial WASC accreditation in 1993, after graduating its first student that year (CFR 1.5). In 2003, The Scripps Research Institute announced the expansion of its operations into Palm Beach County, Florida. According to the then-President Richard Lerner, Ph.D., the new campus would focus on basic biomedical science, drug discovery, and technology development. Together with the world-renowned Max Planck Florida Institute and Florida Atlantic University, Scripps Research is part of a scientific hub in Jupiter, Florida.

Discoveries from Scripps Research scientists include:

- a new yeast model that reveals how human ribosomes may function in both healthy and diseased states; cells can manage stress through a process dubbed 'ribo-tuning.' This means cells reprogram themselves by evolving their genes to bind to specialized ribosomes, which are produced under stress conditions;
- a mysterious family of cellular proteins called OSCAs

and TMEM63s are a novel class of mechanosensitive ion channels;

- a blood test that promises to diagnose Alzheimer's disease before symptoms appear;
- a compound that might protect brain cells against Parkinson's disease;
- small-molecule folding probes that enable them to quantify functional, normally folded and disease-associated misfolded conformations (shapes) of a protein-of-interest in cells under different conditions;
- the two proteins that sense blood pressure and help control the baroreceptor reflex, which keeps blood pressure fairly consistent;
- a new mechanism for memory formation;
- a method that allows chemists to construct novel, complex and potentially very valuable molecules, starting from a large class of compounds known as carboxylic acids, which are relatively cheap and non-toxic;
- sites of vulnerability on the surface of Ebola virus that are targeted by the antibodies in ZMapp, the experimental drug cocktail administered to several patients during the recent Ebola outbreak;
- how cells stay healthy, uncovering an important connection between a cell's sugar metabolism and its antioxidant response, one of the cell's key mechanisms to protect itself from oxidative stress and other damaging agents;
- that compulsive eating disorders share the same addictive biochemical mechanism with cocaine and heroin abuse;
- a new class of anti-diabetic compounds;
- x-ray and cryo-EM structures of the HIV Envelop protein, hepatitis E2 surface antigen and the circumsporozoite protein from *Plasmodium falciparum* that enable structure-assisted vaccine and therapeutic design for HIV, hepatitis C, and malaria; and
- vaccine immunogens and therapeutics for HIV-1 and influenza virus.

For a more comprehensive list of discoveries, click on this link. (CFR 2.8)

1.2 Mission, Vision, and Values

Scripps Research is one of the world's largest, private, non-profit research organizations. Our mission is to perform basic biomedical research to obtain a deep understanding of the most fundamental processes of life and to train the next generation of transformative research scientists. The Institute seeks to build on its well-established track record of major contributions to improving human health and to advancing knowledge via excellence in research and education.

The Institute - which is located on campuses in La Jolla, California, and Jupiter, Florida - is a world leader in research in molecular and cellular biology, structural biology, immunology, virology, chemistry, biophysics, and neurosciences. Our work touches on many aspects of human pathophysiology, including autoimmune and cardiovascular disorders, diabetes, Alzheimer's disease, cancer, drug addiction, and infectious diseases.

We are committed to promoting diversity and to provide equal opportunities for all members of our community. We embrace an interdisciplinary and collaborative spirit that crosses traditional scientific disciplines to foster the highest levels of creativity in discovery and invention.

Scripps Research has a vision to:

1. advance scientific understanding;
2. educate scientists of tomorrow; and
3. impact human health across the globe.

Scripps Research is guided by values that are rooted in a promise to:

1. engage in great science;
2. advance human health;
3. recognize that scientific discovery is never-ending and always evolving; and
4. recognize that the impact of our work is limitless.

1.3 One Institute, Two Campuses

The Institute has a single administrative support structure that oversees the two campuses. While functions such as sponsored research, grants management, purchasing, human resources, finance, philanthropy, legal, and many others are headquartered on the California campus, each unit has senior staff on location in Florida who report to the Vice Presidents in California and manage these offices in a bicoastal fashion.

The collaborative two-campus model is also reflected in many of the ongoing research activities of the Institute. Faculty on either campus can access and use research facilities physically located on the other coast. Similarly, the library is managed from the California campus; however, the vast majority of the collection is available online. For items that are not available online, students, postdoctoral fellows, faculty and other research staff on either campus can easily access them via a very

convenient internet link with the librarians who provide PDF copies of articles requested—or copies of the monographs themselves—either from the Institute's on-shelf collection or through an efficient interlibrary loan system.

Scripps Research has committed to developing and implementing a new research model between a basic research institute and a translational science institute to ensure a sustainable future of research innovation. The Scripps Research Institute (Scripps Research) the California Institute for Biomedical Research (Calibr) and Scripps Translational Science Institute (STSI), now renamed Scripps Research Translational Institute, (SRTI) – three leading non-profit research organizations – signed a strategic affiliation that combines the three organizations into a new biomedical research entity with the tools and know-how to rapidly translate its scientific discoveries into life-saving medicines for the public benefit. This new partnership combines the strengths of three institutions: Scripps Research and its expertise in basic science; Calibr and its strength in drug discovery; and the Translational Institute's broad knowledge in translational and clinical research. Importantly, the integration of basic scientific and translational research will reduce the costs and timelines associated with the crucial early stages of drug development, and lead to the creation of a self-sustaining model for non-profit research in which drug development successes drive the funding of new scientific discoveries and medicines many years into the future.

1.4 Organizational Structure

Scripps Research is organized to maximize the throughput of groundbreaking basic research to applied clinical applications for the betterment of human health. Under the Scripps Research model, a strategic alliance between basic research, translational applications, and drug discovery accelerates a passion to bring renowned scientific research to improved medical outcomes. Recent bench to bedside research under this model includes Vandaqel (neurodegenerative disease treatment); Cyramza (gastric and lung cancer chemotherapeutic); and Abthrax (inhalation anthrax treatment).

Scripps Research faculty are organized into five academic departments. These bicoastal departments (Chemistry, Immunology and Microbiology, Integrative Structural and Computational Biology, Neuroscience, Molecular Medicine) have co-chairs on each campus and serve three core functions: an administrative function for disseminating institutional information; a scientific function by sponsoring scientific seminars to share knowledge; and a mentoring function for faculty growth, development, and promotion.

The Graduate Program is agnostic to departments. When students matriculate into the Graduate Program, they do not join a department. Students have access to the entire curriculum and the entire faculty affiliated with the program regardless of the faculty member's department. This approach allows students to be broadly trained and emphasizes the development of basic knowledge in the chemical and biological sciences.

1.4.1 Board of Directors

Under the provisions of the Bylaws of The Scripps Research Institute, the activities and affairs are directed by the Board of Directors (**Appendix 1-1**). This includes the finances and all the physical properties of Scripps Research. The Board administers the invested funds, sets the annual budget, and determines policies of operation.

The Board of Directors meet a total of three times per year during the fall, winter, and spring.

The Board of Directors established four Committees of the Board focused around philanthropy, governance, finance, and audit. A Charter for each Committee of the Board outlines the purpose, member composition, authority, responsibilities, duties, procedures, fiduciary obligations, and required expectations for communications with the Board of Directors.

The nineteen members of the Board of Directors represent world-renowned scientists and unparalleled expertise in drug discovery, investments, medical innovation, legal affairs, financial management and a representative from the Scripps Research Faculty. A complete list of the Board members and the Charters for the Committees of the Board may be found in **Appendix 1-2**. (CFR 3.7, 3.9)

1.4.2 Governance

Governance occurs through the Board of Directors and more specifically the Governance Committee of the Board. The Governance Committee oversees matters relating to the composition of the Board, delegation of authority to management, the vision, mission and values, executive compensation and benefits, conflicts of interest, and professional affairs.

Relevant information is disseminated from the Board of Directors and the Committees of the Board to the institutional leaders who serve on the Board and the executive leadership team.

The President/CEO and institutional leaders meet a

minimum of three times per year with the bicoastal co-chairs who represent the five academic departments. Through the meetings, the chairs act as a conduit for relaying information between faculty and the executive team.

Scripps Research recently announced the establishment of a Board of Overseers, which significantly expands the institute's advisory network. The new Board serves in an advisory capacity to institute leadership and its Board of Directors regarding academic, scientific and business strategies, as well as provide support for the institute's philanthropic efforts. The twenty-one founding members of the Board, include influencers in biotechnology, pharmaceuticals, academia, law, science policy, and investment.

The Faculty Planning Committee is an advisory group to the President that is complementary to that of the department chairs. The Faculty Planning Committee was established to facilitate productive, two-way communication between the leadership and the faculty. They raise topics of particular faculty interest to the leadership and to provide direct feedback.

A faculty meeting is held at the annual Graduate Student Symposium. All faculty town hall meetings occur up to two times per year. As needed, research department chairs form special committees to study issues of importance to the Institute and/or research departments.

Consideration is being given to form a non-Board, Graduate Program advisory committee which would include at least one Director of the Board to further drive and shape education initiatives.

1.4.3 Leadership

The leadership infrastructure has purposefully remained nimble and relatively flat to allow research laboratories to conduct scientific pursuits in a fast-paced environment that limits bureaucratic infrastructure.

On September 15, 2015, The Scripps Research Institute announced the appointment of chemist Peter G. Schultz, Ph.D. as Chief Executive Officer (CFR 3.6, 3.8). After sixteen years on the faculty as well as several years as Director of the California Institute for Biomedical Research (Calibr), Prof. Schultz was delighted to give back to the Institute in a leadership role.

One of his first orders of business was to fill the executive office with leaders who would work closely to establish strategic goals and priorities for the Institute. Of particular note, the following six leaders have direct academic, financial, or personnel impact on the Graduate Program. They are: (1) Matthew Tremblay, Ph.D., Chief Operating Officer who oversees technology development, legal, information systems, research services, and facilities; (2) James R. Williamson, Ph.D., former Dean of Graduate and Postdoctoral Studies, who was promoted to Executive Vice President of Research and Academic Affairs. In this new role, he oversees academic planning, the academic department chairs, faculty affairs, training program partnerships, core facilities, and the Graduate Program; (3) Douglas Bingham, who was named Executive Vice President of Florida Operations and Board Secretary; (4) Eric Topol, MD, Executive Vice President and Director of Scripps Research Translational Institute; (5) Jared Machado who was promoted to Chief Financial Officer and Board Treasurer and has the responsibility of managing Scripps Research's budget and finances (CFR 3.8); and (6) Jennifer Crosby-Meurisse, Vice President of Philanthropy & Community Engagement, who works hand-and-hand with the Graduate Office to secure funds to support the Institute's research and academic goals.

The leadership structure was developed to ensure support for scientific research departments, education and training, translation to clinical trials, philanthropy, community engagement, technology, communications and facilities, and alignment between campuses. **Appendix 1-3** provides an organizational chart of Scripps Research.

1.4.4 Faculty

When new faculty join the Institute, their appointment is to do research. Expectations about research and scholarship are included in the faculty handbook which can be found at **Appendix 1-4** (CFR 2.8-2.9, 3.2-3.3). There is no explicit teaching requirement for the research appointment. The faculty are then invited to join the Graduate Program. If they choose to join the program faculty, they are given an appointment letter indicating their commitment to participate in activities of the Graduate Program including teaching, laboratory training, research guidance to students, and student advisory committees.

In academic year 2017-18, 156 out of 200 Scripps Research faculty participated in the Graduate Program (CFR 3.1). With an enrollment of nearly 300 graduate students, the faculty to student ratio is 1:2, or one faculty member for every two students. The term faculty at Scripps refers to all employees who are hired to run a research program and are eligible to apply for external funding support. There are two faculty tracks: tenure (Professor, Associate Professor, Assistant Professor) and non-tenure (Professor of Subject or Institute Investigator). Both tracks are eligible to take graduate students and participate in the Graduate Program.

Figure 1: Graduate Program Faculty by Title and Gender

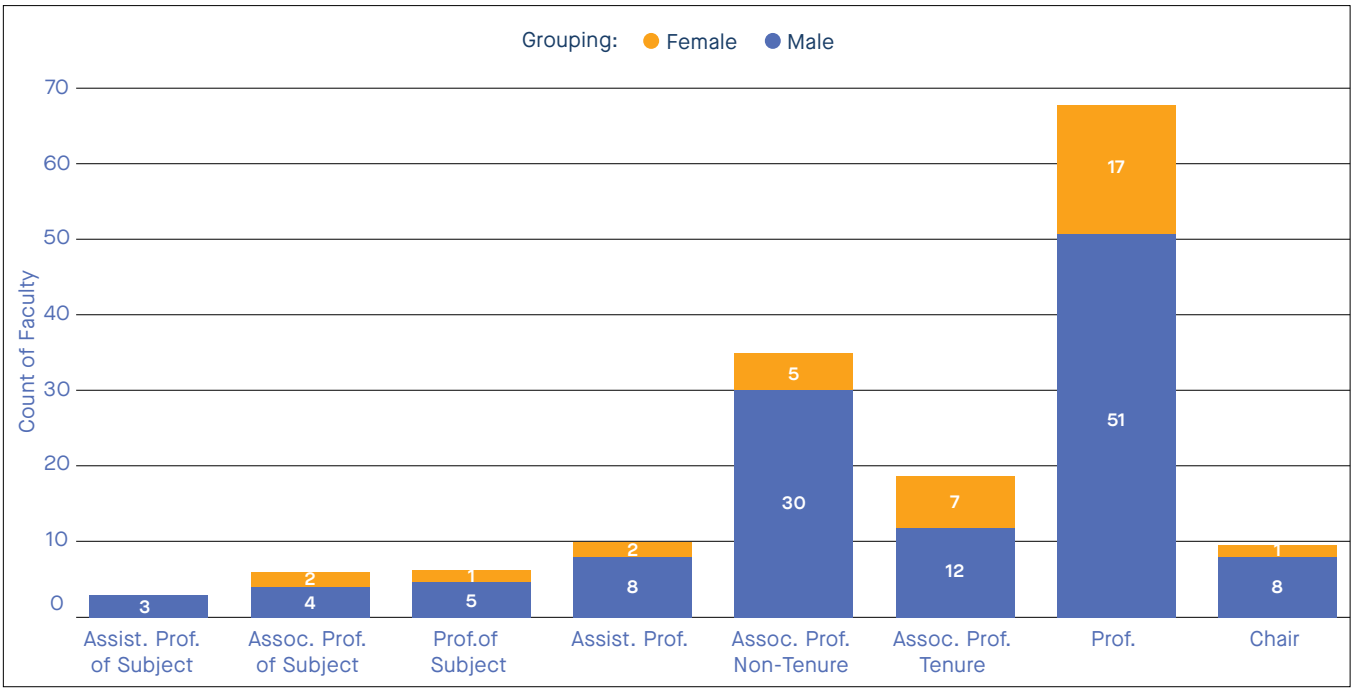


Figure 1 illustrates the number of the Graduate Program faculty by title and gender. Even though there are more than fifty non-tenured faculty heavily involved in the Graduate Program, most of the faculty are full professors or tenure-track professors. To view the faculty demographics in more depth, click on the title of **Figure 1.**

Scripps Research is committed to promoting diversity at all levels and to providing equal opportunities for pursuit of scientific inquiry. The Institute recognizes that a broad representation of perspectives and experiences strengthens our pursuit of excellence in science and education.

Gender and underrepresented minority diversity of faculty in the fields of chemistry and the biological sciences remains low (**Table 1**). Many universities have myriad strategies to combat this problem. A concerted effort to increase the number of women and underrepresented minorities in these fields remains a priority for Scripps Research (CFR 1.4, 3.1).

Table 1: Scripps Faculty by Gender and URM

Source[1]	Female	URM
Scripps	22%	4%
UCSD	34%	9%
National	23%	6%

As of July 31, 2018, the Graduate Program faculty demographics are as follows: 22% female and 4% underrepresented minorities. **Table 1** shows how Scripps Research faculty compares to UCSD and other universities across the United States that provide data to the Department of Education (CFR 1.4, 3.1). The Strategic Plan, found in **Appendix 1-5**, stresses the importance of building a diverse faculty which is likely to increase the diversity of students enrolling in the Scripps Graduate Program. **Section 2.1.1 of Component 2** describes some of our progress in this arena.

1.5 Doctoral Program in Chemical and Biological Sciences Overview

The Graduate Program, which has been woven into the fabric of the Institute, provides an exceptional training opportunity in a unique learning environment for outstanding and intellectually diverse students. One of the strengths of the program is its commitment to personalizing and tailoring the educational experience to enable students to maximize their potential and talents. This is achieved by allowing students to receive interdisciplinary training from faculty with expertise in many different disciplines. Faculty video clips illustrate the breadth of research opportunities available at Scripps Research.

The central mission of Scripps Research's Graduate Program is to train the next generation of scientists at the interface of biological and chemical sciences for productive careers that will benefit human health and the global economy. (CFR 2.1, 2.3) This is achieved through the following Program Learning Outcomes (PLO's):

1. **Research Skills:** equip graduate students with new and expanded scientific knowledge and laboratory techniques;
2. **Critical Thinking Skills:** strengthen students' critical thinking through innovative curricula, cutting-edge research, program activities, and campus workshops and seminars;
3. **Scientific Communication Skills:** develop students' ability to generate and communicate ideas and methodologies to answer some of the world's most challenging and cutting-edge scientific questions through multidisciplinary scientific collaborations; and
4. **Professional Development Skills:** support and develop students' personal and professional skills.

1.5.1 Graduate Program Leadership

The Graduate Program is overseen by the Office of Graduate Studies, a staff of ten people who are dedicated to the mission of the Institute and, more specifically, to helping graduate students successfully complete their doctoral studies. The office's purpose is multi-faceted as it serves many constituents: it creates and maintains a collaborative and uniquely interdisciplinary academic environment in which graduate students are educated and empowered, faculty research programs are supported and advanced, undergraduate students are motivated and inspired to continue their education, and the public is informed and connected to the groundbreaking biomedical discoveries being made at Scripps Research. The Graduate Office's organizational chart can be found in **Appendix 1-6.**

The program is overseen by the Dean, Philip E. Dawson, Ph.D., who provides strategic direction and academic oversight for the program. He is assisted by two Associate Deans: Christoph Rader, Ph.D. (Florida) and Wendy L. Havran, Ph.D. (California). They work collaboratively with the Director of Graduate Studies, Dawn L. Eastmond, Ph.D. who oversees the administrative and academic components of the program as well as the office staff. In this role, Dr. Eastmond is the catalyst for developing and delivering innovative programming, courses, and workshops for high school, undergraduate, and graduate students by expanding our partnerships and collaborations across both campuses and in the community. The Graduate Program administration brings expertise in biomedical research, educational programming, and minority recruiting, all of which are critical for this program.

Since our External Program Review in 2013, the staff has grown to support an expanding student body and the additional assessment and accreditation requirements necessary to maintain a world-class, bicoastal graduate program (CFR 2.7). In 2013, an Administrative Director oversaw the program, a Director of Education was responsible for assessment and recruiting, and three administrative assistants provided support. The staff has grown from five to ten people and is now equipped to deliver the core functions expected of a top-tier doctoral degree-granting program which includes: the recruitment and admission of a diverse group of highly talented students; monitoring the progression of students through the program; administering frequent internal review of the curriculum; partnering with various offices in the design and implementation of professional development opportunities; advising graduate students on program requirements and opportunities and connecting students with potential thesis advisors; providing specific reports and data tables to the faculty, students, and administration; enforcing regulations and policies of the Institute and the program; serving as the driving force for the program's marketing and advertising campaigns; coordinating and assigning internal graduate fellowships; managing program budget; providing administrative support to student organizations; overseeing the program's website and other communication pieces; collecting and analyzing student learning data; overseeing annual commencement; and sponsoring alumni activities (CFR 2.12).

Given the importance and the breadth of the work done by the Graduate Office staff, training, and coaching are critical for success. Graduate Program administration endeavors to provide professional development opportunities for the staff. The goal is to hire, train, and retain an administrative team who are diverse, engaged, and knowledgeable.

1.5.2 Graduate Program Governance

The Scripps Research Graduate Program relies on the expertise and commitment of its faculty, students, alumni, administration, and committees. A list of committees that are central to the Scripps Research Graduate Program may be found in **Appendix 1-7.** (CFR 2.4)

1.5.3 Graduate Students

There has been a slow and steady increase in the number of students which aligns with the flux in faculty appointments and funding. **Figure 2** shows the number of students enrolled in the program every year from 2007 to 2017. There are currently 287 students enrolled in the Graduate Program – 227 students on the California campus and 60 students on the Florida campus. Campus enrollment objectives were set at a steady-state of 220 California students and 80 Florida students. Successful recruitment efforts, a strong reputation, and faculty support for training talented graduate students have contributed to nearly reaching the enrollment objective of approximately 300 total students. Some faculty have expressed interest in having more students. A very targeted marketing and recruitment effort will be conducted by the bicoastal admissions committee on behalf of these faculty and/or disciplines. To view the enrolled students' data in more detail, click on the title of **Figure 2**.

While Scripps sets a target number for the entering class every year, this target is only met if the applicants are qualified and could be successful in our highly-intense research institute learning environment. Thus, total class sizes have ranged from a low of 33 in 2009 to a high of 61 in 2014. Applicants to Scripps Research are also applying to other top-10 graduate programs (e.g., Harvard, Stanford, Johns Hopkins, Caltech); enrolling the top applicants can therefore be challenging. **Figure 3** displays the entering class size from 2007-2017. To view the entering student class size in more detail, click on the title of **Figure 3**.

1.5.3.1 Diversity and Inclusion within the Student Body

Student diversity remains a high priority for the Graduate Program. To benchmark our progress, Scripps Research relies on the NSF's Graduate Students and Post Doctorates in Science and Engineering report. In this report, NSF indicates 56% of biology and 41% of chemistry graduate students are female. Scripps Research is not far off the mark with a current student body that is 39% female and 61% male given that approximately half our students are in chemistry. (CFR 1.4)

Significant work is being done to increase the ethnic diversity amongst the student body. Underrepresented minorities admitted into the Graduate Program went from a low of 3% in the 2007 class to a high of 19% in the 2018 class. Gender gains have also been realized with a low of 15% in 2010 to 46% female for the 2018 class. The improvement from years 2007 to 2017 can be seen in **Figure 4**. Currently, the ethnic percentages of our students are 2% African American, 7% Hispanic/ Latino, 1% American Indian, and 1% Native Hawaiian/

Figure 2: Total Enrolled Students from 2007-2017

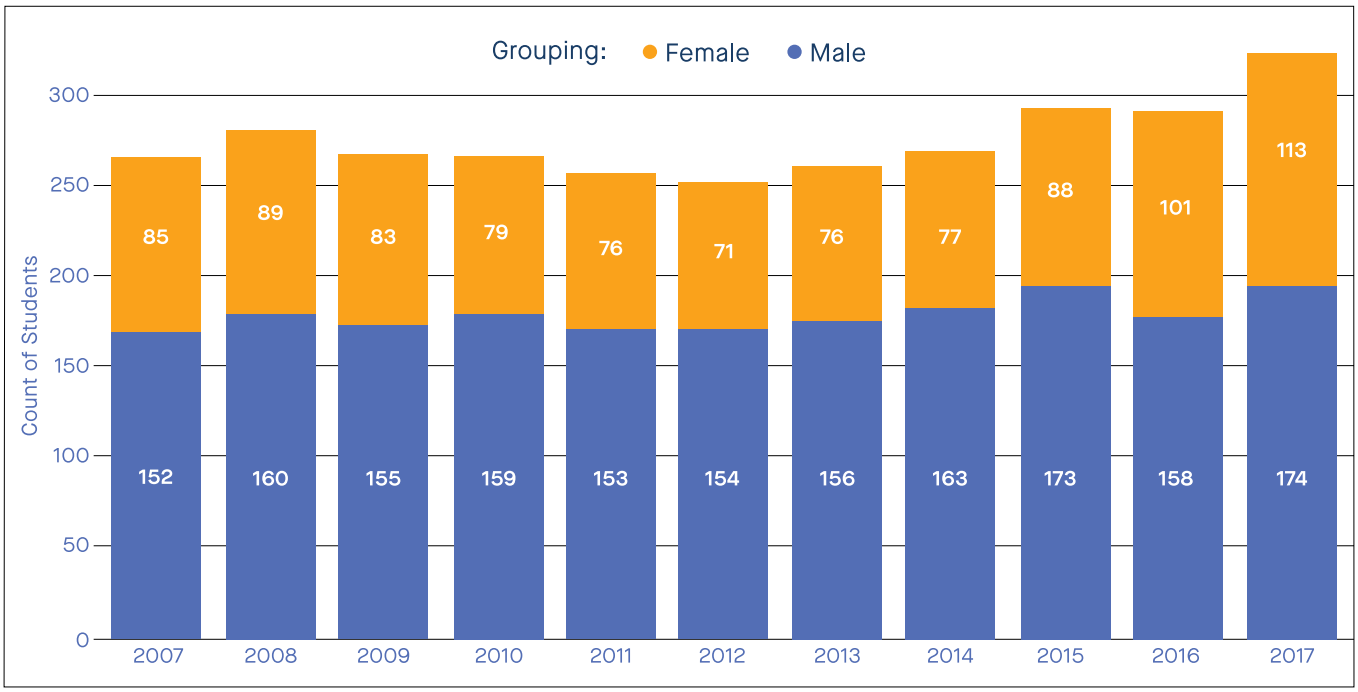
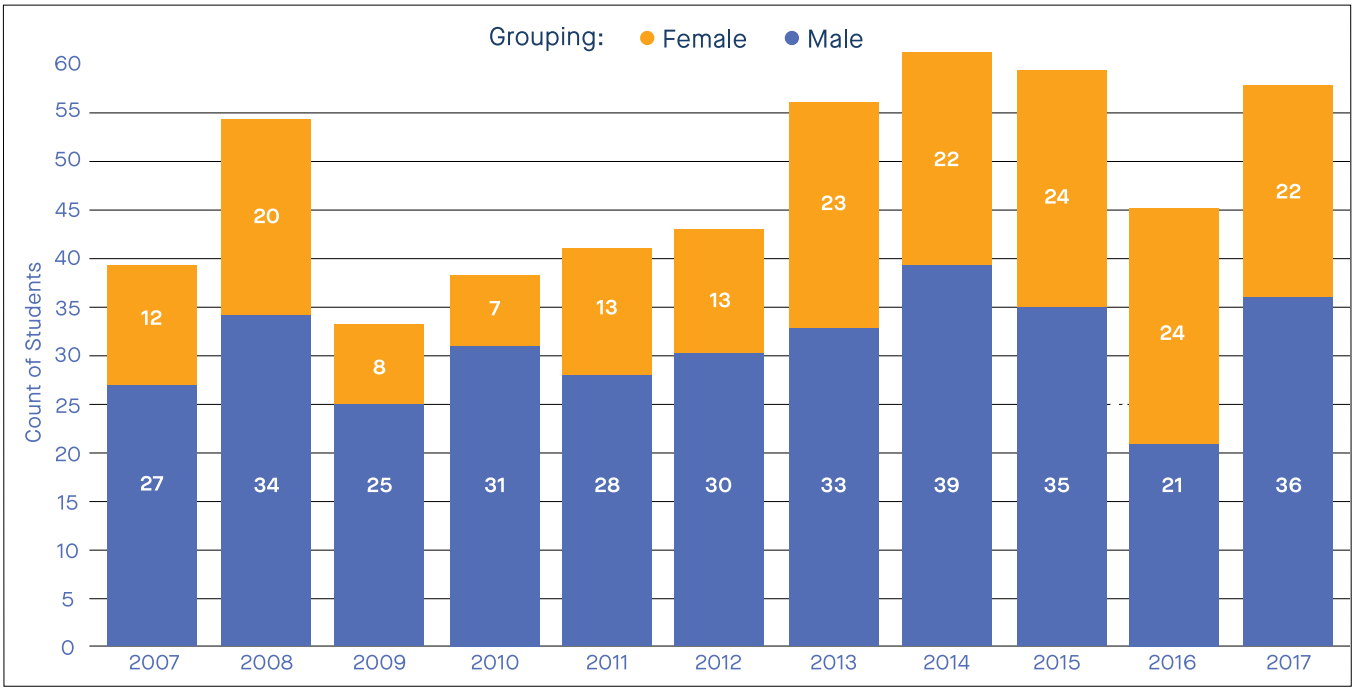


Figure 3: Enrolled Students by Class from 2007-2017



Pacific Islander, a modest 11% of the total student body. Although the NSF reports 11% of biology and chemistry graduate students are underrepresented minorities, we believe that we can do better and aim to have 15% minorities. The admissions committee continues to make a strong push to recruit and admit highly qualified women and URM students through Scripps Research outreach programs and recruiting initiatives. To view the ethnicity of student body demographics in more detail, click on the title of **Figure 4**.

1.5.3.2 Citizenship

It should also be noted that a substantial number of Scripps Research graduate students are foreign nationals. Approximately 35% of our student body are non-U.S. citizens which adds to the rich tapestry of our training environment. The top three countries from which we recruit graduate students are China, Canada, and India.

Scripps Research has a dedicated International Services Office with staff on both campuses that develops programs geared toward the unique issues facing foreign nationals and their families. More in-depth information can be found in **Section 5.5.2 in Component 5** as well as at this link.

1.6 Response to Previous Commission

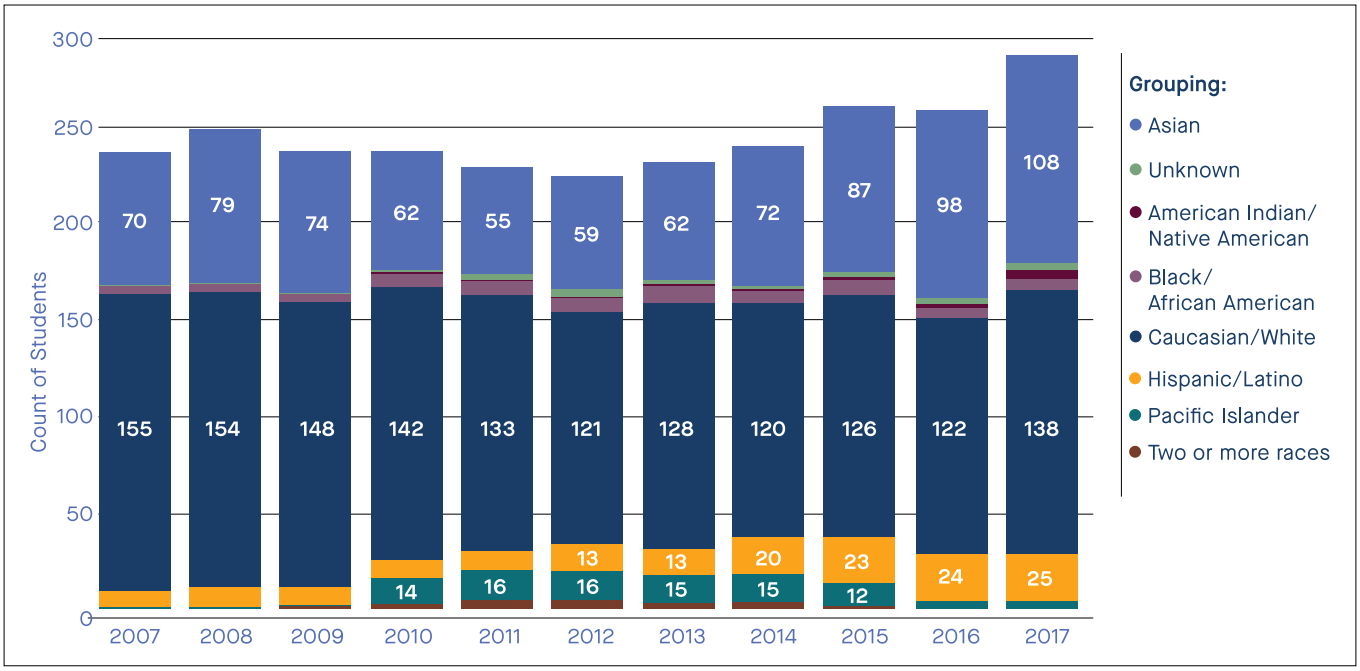
In its March 2011 action letter, the WSCUC Commission made four recommendations. They were: (1) develop a strategic plan that 'articulate[s] priorities, define the future direction of the institution and align academic, personnel, fiscal, physical, and technological needs;' (2) implement the program review process on the proposed schedule; (3) clarify the rubrics in assessing student learning and routinely share the information with students; and (4) show leadership in both the faculty and the student body diversity. A copy of the action letter can be found in **Appendix 1-8.**

These recommendations were satisfactorily addressed in an Interim Report submitted on March 1, 2014 (**Appendix 1-9**). On July 10, 2014, an Interim Report Committee convened and considered Scripps Research's report. The committee commended Scripps Research for its thorough and comprehensive approach to the review.

They also requested a fully developed strategic plan for the Institute and the Graduate Program due on November 1, 2016. A copy of the action letter following the Interim meeting can be found at **Appendix 1-10**.

Here is a summary on all the issues raised in the original action letter. Additional details are provided in the appropriate sections of the Institutional Report. (CFR 1.8)

Figure 4: Total Enrolled Students by Ethnicity



1.6.1 Strategic Planning

In 2012, Dean Williamson (who stepped down in April 2017) met with the Board of Trustees, President/CEO, Chief Operating Officer, and Senior Vice President of External Affairs to garner support for this WSCUC requirement. The Director of Graduate Studies, Dawn Eastmond, and Education Consultant, Sharon Joyce led strategic planning discussions with the Deans to develop a process. They also met with faculty, students and staff and conducted an environmental scan. This exercise helped administration understand the strengths, weaknesses, opportunities, and threats to the Graduate Program. Based on all the feedback, the following priorities were defined: Priority 1: Strengthen Academic Experience and Reputation; Priority 2: Enroll a High-Quality, Diverse Study Body; Priority 3: Engage Students in their Development, Learning, and Success; Priority 4: Strive for Excellence in Research and Teaching; Priority 5: Expand Educational Outreach and Community Engagement; Priority 6: Increase Graduate Program Effectiveness and Sustainability (CFR 2.12).

The strategic plan with its specific initiatives and metrics can be found in **Appendix 1-5**. (CFR 4.6)

1.6.2 Program Review

Scripps Research has a robust Program Review process (CFR 2.7). The following actions have been taken to institutionalize the process including: (1) development and clarification of each step of the review process; (2) further development of database systems to allow for quantitative evidence to be gathered on students, faculty, courses, and alumni; (3) an Annual Report designed to focus on key performance indicators of student learning and success; (4) a formalized Program Review Policy; (5) an integrated two campus (California and Florida) External Program Review process; (6) a response and action plan that outlines decisions made, next steps, and timeframes following the completion of self-study and the EPR; and (7) enhancements to communicating Program Review outcomes and actions plans.

Beginning in 2014, an enhanced Internal Program Review has occurred annually with a one-week bicoastal review that brings faculty and students together in-person on the Florida campus and through bicoastal video broadcasting (CFR 2.7). This is followed by an External Program Review every 3-5 years.

As part of the cycle of assessment, an External Program Review (EPR) occurred in winter 2013 (CFR 2.7). The EPR included external peer site visits to both campuses. The Florida External Program Review Report and Florida External Program Review Team Report may be viewed in **Appendix 1-11** and **Appendix 1-12**, respectively. The EPR Report and EPR Team Report that represents the entire Graduate Program may be viewed in **Appendix 1-13** and

Appendix 1-14, respectively. The EPR Report includes a section on the progress made on the four areas addressed by the 2011 WASC Commission Action Letter. (CFR 1.8)

Recent changes made through the Program Review process are described in detail in **Component 6**.

1.6.3 Assessment of Student Learning

The Research Training Self-Study Committee and the Dean's Committee continue to review and reflect on several issues pertaining to the assessment of student learning. In the 2017-2018 academic year, the committee focused on the following issues: (1) criteria for the selection and training of the advisory committee members; (2) candidacy examination requirements; and (3) the assessment of dissertation quality. More specifically, the Research Training Committee discussed criteria and expectations related to the composition and functions of the advisory committee. Accordingly, the written guidelines for the advisory committee meeting were considerably expanded and updated. This revised document now includes an explicit description for selection of suitable advisory committee members, the definition and resolution of conflict-of-interest issues, and an enumeration of specific responsibilities of the advisor and of other committee members. In addition, the committee discussed the topics and quality of dissertations and revised the Guide for Thesis Production. Changes include a statement of "what constitutes a good thesis," how to include published research in the thesis, and guidelines for attribution of collaborative work related to publications and/or to other thesis-related work. (CFR 4.1-4.6)

1.6.4 Diversity

Scripps Research developed a multi-year, multi-phased initiative to achieve diversity and inclusion. It contains three interrelated initiatives: (1) campus climate; (2) access and outreach; and (3) recruitment and retention. To address campus climate, the Office of Faculty Mentoring was created to address the following issues: improvements in the preparation of grant applications; becoming familiar with the promotion process at Scripps Research; establishing effective collaborations; setting research priorities; and training graduate students and postdoctoral fellows.

Prior to 2010, Scripps Research relied on its outstanding reputation as a leader in biomedical research to attract top students to its Graduate Program. Many prospective students discovered the Scripps Research Graduate Program through general reputation or knowledge of the faculty, scientific papers, faculty presentations at their college or university, or a presentation at a scientific meeting. Alumni and former trainees who oversee research programs at research institutes, colleges, and universities all over the world are also a great source of prospective students; however, it is not enough. Through many discussions with executive leadership, the Institute decided to invest resources in the development and implementation of an Institute-wide summer internship program that would expose more students, particularly from underserved and underrepresented groups, to the cutting-edge research and top-notch educational programs offered at Scripps Research.

Recruitment and retention of diverse students is critical for achieving the mission of Scripps Research and the Graduate Program. To increase awareness of Scripps Research Graduate Program and to attract a strong, diverse group of applicants, the following strategies were implemented: (1) the Graduate Program participates in local community science events and national scientific conferences; and (2) the Director of Graduate Studies serves as a judge at NOBCChE, SACNAS, and ABRCMS conferences every year. These opportunities help develop relationships with national organizations, school administrators, and faculty to establish key recruitment pipelines. (CFR 1.4)

1.6.5 Interaction with WSCUC

In 1989, Scripps Research's Graduate Program was established with an inaugural class of six students. In four short years, the first student graduated in an elaborate ceremony for one student and many faculty and administrators. This enthusiasm was also conveyed in the Initial Accreditation letter from the WASC Commission; it stated that Scripps Research's Doctoral Program in Macromolecular and Cellular Structure and Chemistry offered by the Institute provided superb educational opportunities in terms of faculty, curriculum, and research facilities.

In 1999, Scripps Research underwent a successful reaffirmation of accreditation and received positive comments from the WASC Commission. In its July 6, 1999 letter reaffirming the accreditation of the Scripps Research Graduate Program, the WASC Commission noted the presence of "a highly effective analysis and critique of your themes as well as a positive and rewarding team review for WASC and the Institute."

In 2006, Scripps Research submitted its Institutional Proposal, followed by the 2009 Capacity and Preparatory Review (CPR) report, and the 2010 Educational

Effectiveness Review (EER) report. In response to the CPR report and CPR onsite visit, the June 26, 2009 WASC Commission letter to Scripps Research stated that, "It wished to echo the team's observation that Scripps Research has a highly motivated and dedicated faculty, as well as outstanding graduate students who work together in an atmosphere of cooperation and collegiality while maintaining outstanding scientific rigor." In response to the EER report and onsite visit, the March 7, 2011 WASC Commission letter stated that, "TSRI developed what the team found to be some "best practices" in graduate education, such as the comprehensive way students will be evaluated through the use of rubrics in regular advisory committee meetings." The WASC Commission reaffirmed TSRI's accreditation with the Interim Report for spring 2014, CPR for fall 2019, and the final EER for reaffirmation for spring 2021.

Following the 2010 EER visit and the subsequent 2011 Commission Action Letter, WASC underwent a full review of the three-step accreditation process (Proposal, CPR, and EER) and adopted a new review process. Under the new format, a Comprehensive Mid-Cycle Review (MCR) took place for spring 2016. A one-day Offsite Review (OSR) will occur in spring 2019 and the three-day comprehensive on-site Accreditation Visit (AV) for reaffirmation will occur in the fall 2019.

1.7 Preparation for WSCUC Reaffirmation of Accreditation

The Graduate Program began planning for reaccreditation in January 2018. A committee of Graduate Program administrators and chairs of the self-study committees were appointed. The Dean and Accreditation Liaison Officer (ALO) worked collaboratively to identify members of the committee and others to serve on writing teams.

The Institutional Report addresses the WSCUC Standards and Criteria for Review through a narrative designed to convey Scripps Research's unique training environment and its commitment to graduate education. Scripps Research prepared by gathering materials and perspectives from ongoing self-study, qualitative feedback, formal surveys, and program review. Contributors to this report are listed by essay in **Figure 5**.

Figure 5: Writing Teams





2

COMPLIANCE with WASC Standards, CFRs and Educational Effectiveness Indicators

Federal law requires every institution under review for reaffirmation of accreditation to demonstrate that it is in compliance with the Standards and CFRs of the accrediting association.

Scripps Research has engaged in an active process of self-study for the last nine years for several reasons including: (1) change in leadership; (2) completion of an inclusive strategic planning process and implementation; (3) Board of Directors' turnover; and (4) financial concerns.

2.1 Self-Review under the Standards and CFRs

As required in the WSCUC Handbook of Accreditation, the Graduate Program conducted a self-review under the four Standards of Accreditation and thirty-nine Criteria for Review. The goal was to determine indicators of institutional performance, highlight our strengths, and identify areas that need improving. In this section, we briefly highlight both the areas of strength and areas requiring attention.

2.1.1 Standard One

Although having a Graduate Program housed in a world-renowned institute is no longer unique, the reputation and standing of the Scripps Research Doctoral Program in Chemical and Biological Sciences is distinctive, and is due, in part, to the clear mission and strong training environment of the Institute (CFR 1.1). Moreover, PLO's and educational objectives flow from this clear mission (CFR 1.2). The institutional purposes and educational objectives have been clearly defined, and through a recent initiative, student achievement data are collected and made public on the Scripps Research website. In addition, Scripps Research has a very strong academic freedom philosophy and policy that allows faculty to follow their academic passions and interests (CFR 1.3). However, these data are not being widely shared with the faculty and students. More transparency is needed (CFR 1.6, 1.7).

As mentioned in Component 1, diversity of the faculty and the students continues to be a challenge for the Institute; however, Scripps Research remains strongly committed to the pursuit of excellence by including and hiring individuals who represent different groups including race, ethnicity, gender, sexual orientation, socio-economic background, age, disability, national origin and religion. Over the past two years, Scripps Research has conducted a broad bicoastal junior faculty recruiting and hiring process (CFR 1.4, 3.1).

In short, the position description and job announcement were developed to describe the education, qualifications and skills broadly needed for the position(s). The final documents also emphasized the Institute's commitment to diversity and inclusion.

Several new faculty were recruited to Scripps Research during these two years. As an example, the 2017-2018 season has been very successful; five new faculty, including four female faculty, started in 2018, two at the California campus and three in Florida. These new faculty added exciting new programs including regenerative medicine, cancer biology, chemical biology (chemoproteomics), novel immunotherapies and aspects of bacterial biology.

The new faculty bring additional cutting-edge research programs to Scripps Research and provide important opportunities for graduate students to engage in research at the forefront of several areas of science. Several of the newest faculty attended the Graduate Student Symposium in October, interacting with and potentially recruiting a range of students from both campuses. Many of these faculty have also committed to join the Graduate Program, teach in our classes and serve on various program committees.

2.1.2 Standard Two

The core function of Scripps Research is to develop interdisciplinary research programs to improve human health and our track record on this front is second to none. This is evidenced in the $277 million dollars in federal and state funding acquired annually, more than 1000 US patents, more than 80 spin-off companies and seven FDA-approved drugs from Scripps Research discoveries benefiting millions of people worldwide (CFR 2.8). Scripps Research's 200 faculty are highly productive and uniquely qualified to train the next generation of scientists (CFR 2.1). In addition to their scholarship and research responsibilities, 156 of these faculty have also taken on the enormous responsibility to select, teach, and mentor students in the Graduate Program. The PLO's and expectations for teaching and learning have been defined by the faculty (CFR 2.2-2.4). On the other hand, there is no clear linkage between scholarship and service to Scripps Research and teaching and student learning within the Graduate Program (CFR 2.9). More should be done to enfranchise the faculty in developing a collective teaching and mentoring philosophy and understanding its impact on the graduate student experience (CFR 2.4, 2.6).

The Career and Postdoctoral Office (CPSO) offers a diversity of programming, including workshops focused on both academic needs and career-related skills, all of which feature a variety of discussion and workshop topics (CFR 2.11). In addition, the office offers individual career counseling. More information can be found in **Section 4.5.2 in Component 4**.

Recently the Office of Graduate Studies partnered with the Graduate Student Councils on both campuses to develop and execute a student climate survey. This is one of many ways that Scripps Research identifies and supports the needs of students (CFR 2.10).

2.1.3 Standard Three

The Graduate Program was started by Scripps Research's world-renowned faculty. Many of the faculty are recipients of prestigious honors and awards (CFR 3.1). The great reputation of Scripps Research also positively impacts the Graduate Office's ability to hire qualified staff who are engaged in the mission and interested in transforming graduate education. On the other hand, work needs to be done in recruiting and hiring faculty from diverse backgrounds (CFR 3.2). In addition, very little resources are used to develop the faculty and staff (CFR 3.3). As a relatively young institution, Scripps Research has experienced financial challenges in diversifying its revenue sources (CFR 3.4) which then impacts the Graduate Program's ability to realistically budget and plan for changes related to its educational objectives. Additional resources are needed to upgrade the financial management system and other information resources (CFR 3.5).

In addition, communicating effectively across an institute of this size - receiving, analyzing and disseminating critical information to every faculty member - presents challenges. To navigate them, Scripps Research is reinvigorating some established programs and implementing a few new ones. One such committee that is getting new life is the Faculty Planning Committee, which is an advisory group to the President. In addition to the department chairs, who regularly meet with the President, the members of the Faculty Planning Committee help facilitate productive, two-way communication between the leadership and the faculty. They raise topics of faculty interest to the leadership and provide direct feedback. (CFR 3.1, 3.6-3.7, 3.10)

2.1.4 Standard Four

Over the last 5 years, the Graduate Program has made tremendous progress in institutionalizing a set of quality-assurance processes. These include collecting, analyzing, and interpreting data on academic and non-academic programs that are evaluated during Program

Review (CFR 2.7, 4.1, 4.2). There is no question that the Executive Office, Graduate Program administration, and faculty are committed to improving the Graduate Program (CFR 4.3); however, more work needs to be done to engage the faculty in using the results from the program review process to improve student learning as well as helping the faculty develop the skills needed to achieve this goal (CFR 4.4). This will go far in preparing for and responding to the inevitable changes in higher education (CFR 4.7).

2.2 Inventory of CFRs and Educational Effectiveness Indicators

The Inventory of Educational Effectiveness Indicators demonstrates the commitment to ensuring the established core learning outcomes of developing research skills, critical thinking, scientific writing, and verbal communications skills is embedded throughout the graduate experience with processes for measuring the attainment of outcomes and resources for mentoring students to reach their full academic potential. The completed inventory may be viewed at **Appendix 2-1**.

Scripps Research has reviewed all the Criteria for Review (CFRs) under the four WSCUC Standards. A complete review of each CFR may be viewed at this link.

2.3 Institutional Strengths

Through an environmental scan, faculty, students, administrators, and staff reflected on its mission, vision, and values to assess the Institute and Graduate Program's strengths, weaknesses, opportunities and trends (SWOT). The question posed to the Scripps Research community during the exercise was: how can the Institute maximize its strength, minimize the impact of its weaknesses, evaluate and take advantage of opportunities, and modulate trends and threats to remain a top-10 graduate program at the leading edge of innovative graduate education and groundbreaking biomedical research?

During many meetings with Scripps Research's executive team, faculty, staff, and students, the following key strengths were consistently identified:

1. International reputation of faculty;
2. High impact research in chemical and biological sciences;
3. Highly ranked graduate program;
4. Influential alumni in academics, industry, and government;
5. Nimble response to student and postdoctoral fellow needs;
6. Multi-disciplinary and interdisciplinary research and educational approach;
7. Innovative and transformative research;
8. Critical mass in faculty in two locations (CA and FL)
9. Integration of foundational discoveries with translational science.

2.4 Plan for Building Strengths and Addressing Challenges

The primary focus of the Executive Office is to establish a novel non-profit enterprise for research and drug discovery by forming a strategic alliance between a basic research institute and a translational science institute. Calibr is a non-profit drug discovery institute that was established in 2012, with a current portfolio of preclinical assets and more than 50 early-stage projects in a wide variety of disease areas, including diabetes, cancer, arthritis and multiple sclerosis. The Board of Trustees from Scripps Research and Calibr approved formation of a strategic alliance between Scripps Research and Calibr effective October 1, 2018, which results in a unique institution spanning basic and translational research.

In 2017, after a decade of scientific collaboration, the Translational Institute joined Scripps Research, one of the world's largest independent, non-profit research organizations. The close working relationship between Scripps Research, the Translational Institute, and Calibr, is designed to optimize our scientific discoveries, accelerate their evolution from the lab to the clinic—and ultimately, the patient. Critically, the basic research and education focus of Scripps faculty will remain unchanged while providing an expanded network of opportunities to advance clinically important breakthroughs.

The Institute has acted to strengthen the faculty and their research programs through and effort to identify research areas in which to strengthen and invest with new hires, instrumentation and infrastructure. For example, a significant and timely investment in cryo-electron microscopy instrumentation helped propel Scripps into a leadership role in using this transformative structural method to understand basic biology and as a powerful tool to develop vaccines. This in turn helped secure a $12 million grant to develop flu and malaria vaccines from the Bill and Melinda Gates Foundation.

Over the last few years, the Institute has made a concerted effort to decrease our physical footprint and minimize the utilization of leased space. An institute-wide effort to improve our utilization of Institute owned buildings is underway and is expected to be complete by 2020. The resulting reduction in expenses will strengthen the Institute and is expected to significantly reduce institutional overhead rates.

With our expanded communications and branding efforts (e.g. new infinity loop logo, refocusing name to 'Scripps Research') we can better share our discoveries with the public, including national and international media, and we can more productively connect with our supporters. We are vigorously pursuing philanthropic support for both basic research and a clinical fund to support clinical trials. A major priority for fundraising is to establish an endowment for the Scripps Research Graduate Program which has been launched through a $50 million commitment from the Skaggs family to establish endowed Skaggs Fellowships to support the first three years of graduate study. This endowment both strengthens the graduate program and indirectly supports research innovation in the laboratories of the Scripps Research faculty.

Together these initiatives address the changes in the financial environment of supporting scientific research. National governmental funding levels, (NIH) are likely to remain flat and large umbrella funding agreements with pharma have become smaller and more focused. Scripps Research leadership is committed to developing and implementing a new research model to make the Institute sustainable for the future at an elevated level of research innovation. Together, the recent initiatives undertaken by Scripps research can synergistically achieve what no other not-for-profit institution has achieved, a self-sustaining biomedical research institute primarily funded by licensing revenues and philanthropic support.



3

DEGREE PROGRAMS: Meaning, Quality, and Integrity of Degrees

Institutions are expected to define the meaning of the degrees that they confer and to ensure their quality and integrity. Exploring the meaning of a degree thus involves addressing questions about what the institution expects its students to know and be able to do upon graduation and how graduates embody the distinct values and traditions of the institution through their dispositions and future plans.

3.1 Meaning - What it Means to Have a Scripps Research Ph.D.

The meaning of our degree can be summarized in the students' experiences while at Scripps Research (CFR 2.2). This would include the teaching and learning inputs, the culture in which this occurs, and the proficiencies that the students acquire. All of this is best reflected in the (PLO's):

1. **Research Skills:** equip graduate students with new and expanded scientific knowledge and laboratory techniques;
2. **Critical Thinking Skills:** strengthen students' critical thinking and scientific communication skills through innovative curricula, cutting-edge research, program activities, and campus workshops and seminars;
3. **Scientific Communication Skills:** develop students' ability to generate and communicate ideas and methodologies to answer some of the world's most perplexing scientific questions through multidisciplinary scientific collaborations; and
4. **Professional Development Skills:** support and develop students' personal and professional skills.

At its inception in 1989, the Graduate Program was one of the first programs offering interdisciplinary Ph.D. training outside the context of discrete scientific departments. The founders believed that the best science could be realized when scientists were primarily engaged in the pursuit of important scientific questions and the lines between different areas of research were blurred. Offering graduate student training with an opportunity to be co-mentored by a chemist and a biologist and learn both research areas through hands-on experience opened a new frontier for scientific training.

A doctorate earned at Scripps Research has been a highly competitive degree for launching careers in multidisciplinary research and preparing students to be leaders in academia, biotech industry, and many other careers in the twenty-first century by equipping students with the necessary intellectual skills, practical

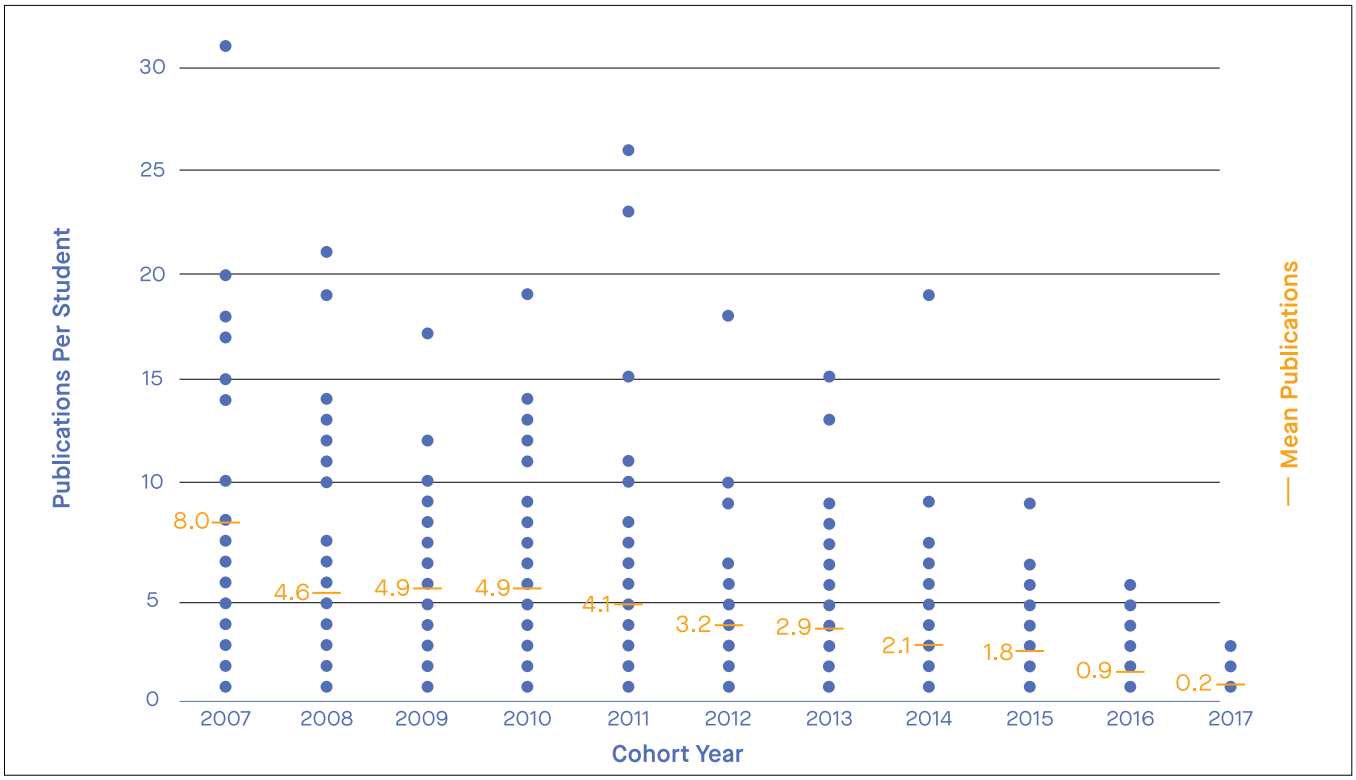
knowledge, specialized and general expertise, and most importantly, how to think about problems and creative solutions.

Students gain the aforementioned knowledge and skills articulated in the PLO's through the two main program components - coursework and research. The coursework was designed to bring students to the forefront of knowledge and provide a solid foundation for critically conducting and evaluating biomedical research. The courses are grouped into six areas of specialization, or tracks, which serve as a guide for students. Students can choose courses within one track for focused studies; however, students are encouraged to customize their courses based on their background and research interests. In this scenario, students can choose courses from several tracks for an individualized program study. The six tracks or research areas are chemistry, chemical biology, biophysics, biology, immunology, and neuroscience.

The second main component of the program is research. First-year students are exposed to cutting-edge research and exemplary faculty mentoring through laboratory rotations; students are required to complete at least one rotation, but are encouraged to rotate through multiple laboratories, intermingle with many faculty to facilitate cross-fertilization of ideas, and become the catalyst for new collaborations.

There are several ways that the degree meaning and/or PLO's are manifested. One of the most important ways is through peer-reviewed publications. Publications are the currency by which graduate students, postdoctoral fellows, and faculty are judged. In **Figure 6**, the average number of degree-related publications per cohort are shown. Each dot represents the number of papers for a student in the cohort. The figure shows that students average around eight degree-related papers in 2007 and less than 0.2 papers in 2017. The 2007 average, however, is unusually high in comparison to subsequent years. This is due to an outlier with > 30 papers. In summary, ten years after enrolling and five years after graduating, students average five degree-related papers. With more time, the number of papers for the later cohorts will also increase because it could take several years after completing the degree for the papers to be published. More important than the number of publications is the number of paper citations. Across the years, the students' publications are cited on average of twelve times per publication. This demonstrates that Scripps Research students are creating knowledge and making discoveries that are impacting the scientific community.

Figure 6: Students' Degree-Related Papers per Cohort from 2007-2017



To view details about the students' papers, click on the title of **Figure 6**.

3.2 Quality - Structure of Program Offering

The quality of the Scripps Research degree can be measured in two ways: externally by others and internally by us. The external quality is best measured when compared with other institutions on key indicators. One such example is the U.S. News & World Report, which periodically reviews the nation's colleges and universities. The latest rankings are based on a survey of department heads, deans, directors of graduate studies, and others at peer schools in each discipline. They are asked to rate the quality of the program at each institution. In addition, they are asked to nominate programs that have excellent offerings in certain specialty areas.

For nineteen consecutive years, the Scripps Research Graduate Program has been ranked in biology and chemistry by U.S. News & World Report. Scripps Research is tied for number ten in biology and tied for number six in chemistry. Click here to see the additional research areas rankings.

The 2017 Nature Index ranks Scripps Research as the number one top stand-alone scientific institute in the United States for producing high-quality research based on discoveries published in leading scientific journals.

Not only was the Graduate Program recognized for its excellence in teaching and learning. Several of our exceptional faculty are recipients of prestigious honors and awards, including two Nobel laureates, twenty-one National Academy of Science members, four Wolf Prize in Chemistry recipients, and eighteen American Academy of Arts and Sciences members, and two Fellows of the Royal Society.

For a full list of faculty honors, click here.

3.2.1 Career Outcomes

Significant national attention has been paid to increasing student preparation for a variety of career paths as well as to changing academic culture to accept this diversity of career choices. Numerous reports, articles, grant mechanisms, conferences, workshops, and courses indicate the landscape has shifted significantly in this respect in recent years. In fact, submission requirements for the NIGMS T32 training grants changed to address career outcomes for scholars, and the Coalition for Next Generation Life Sciences, a group of prominent academic institutions, committed to openly reporting career outcomes for Ph.Ds. and postdoctoral fellows in 2019. (CFR 4.7)

Scripps Research is committed to transparency regarding alumni career outcomes and has taken steps to compile and publish alumni outcomes for graduate students and postdoctoral fellows. Nationally, efforts are underway to unify various career outcome taxonomies to allow for better cross-institutional comparisons. Several organizations are working on this front, including AAU, Coalition for Next Generation Life Sciences, the BEST consortium, Graduate Career Consortium (GCC), Future of Research, Rescuing Biomedical Research, and others. CPSO staff contribute to a GCC committee on this topic, and the Graduate Office and CPSO are closely following these developments.

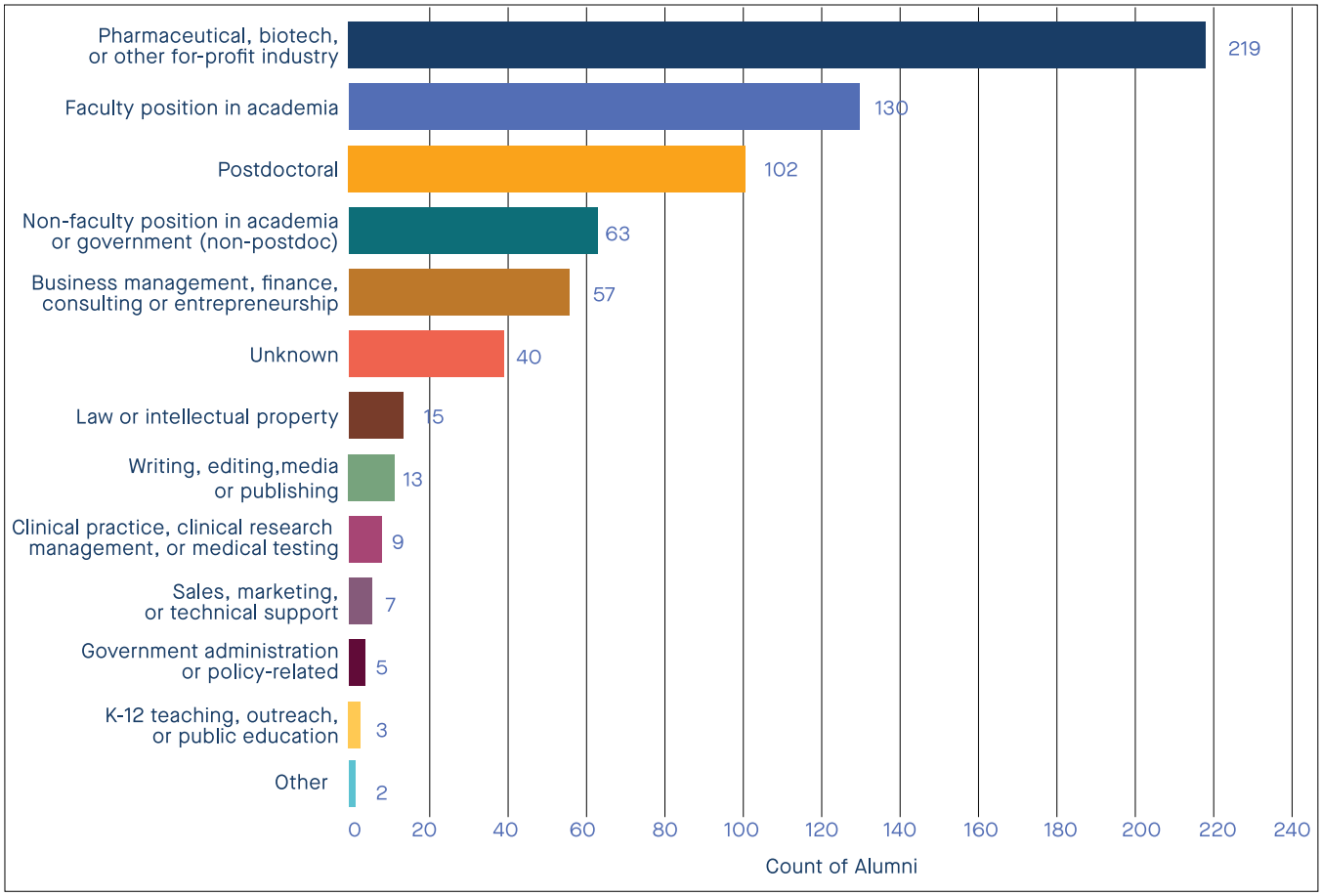
The Graduate Office and Career and Postdoctoral Services Office (CPSO) have been making steady progress toward updating alumni career outcomes and contact data. For the purposes of tracking and categorization, we have developed a schema for classifying alumni which can be found in **Appendix 3-1**. The schema was loosely developed from the career categories represented in the AAAS myIDP online tool. The data collection for the Graduate Program alumni was completed in mid-2018, and **Figure 7** shows a snapshot of the current positions of the alumni. The Graduate Office and CPSO will continue to work to collect similar data for postdoctoral fellows who worked at the Institute.

Nearly 700 students have graduated from the program and are employed in many sectors, including academia, non-profit, government, and for-profit companies (**Figure 7**). Less than 20% of Graduate Program alumni end up in faculty positions. While this percentage is high compared to national figures, the fact remains that most Graduate Program alumni are in non-faculty careers. Students seek careers in a variety of science-oriented positions, and students benefit from a graduate school environment supportive of careers outside of traditional tenure-track academic roles.

Members of the Graduate Office and Career and Postdoctoral Services Office (CPSO) have also worked together to create an alumni website and database using the iModules platform. The website features alumni profiles, news stories about Scripps Research and graduate education, and an online database featuring alumni from the Institute's training and education programs. The newest video can be seen at this link. To view the current positions of alumni in more detail, click on the title of **Figure 7.**

As illustrated in **Figure 7,** the biggest group of alumni is working in the "pharmaceutical, biotech, or other for-profit industry" arena. Examples of employers in this category include Genentech, Merck, and Pfizer. The

Figure 7: Current Positions of Alumni



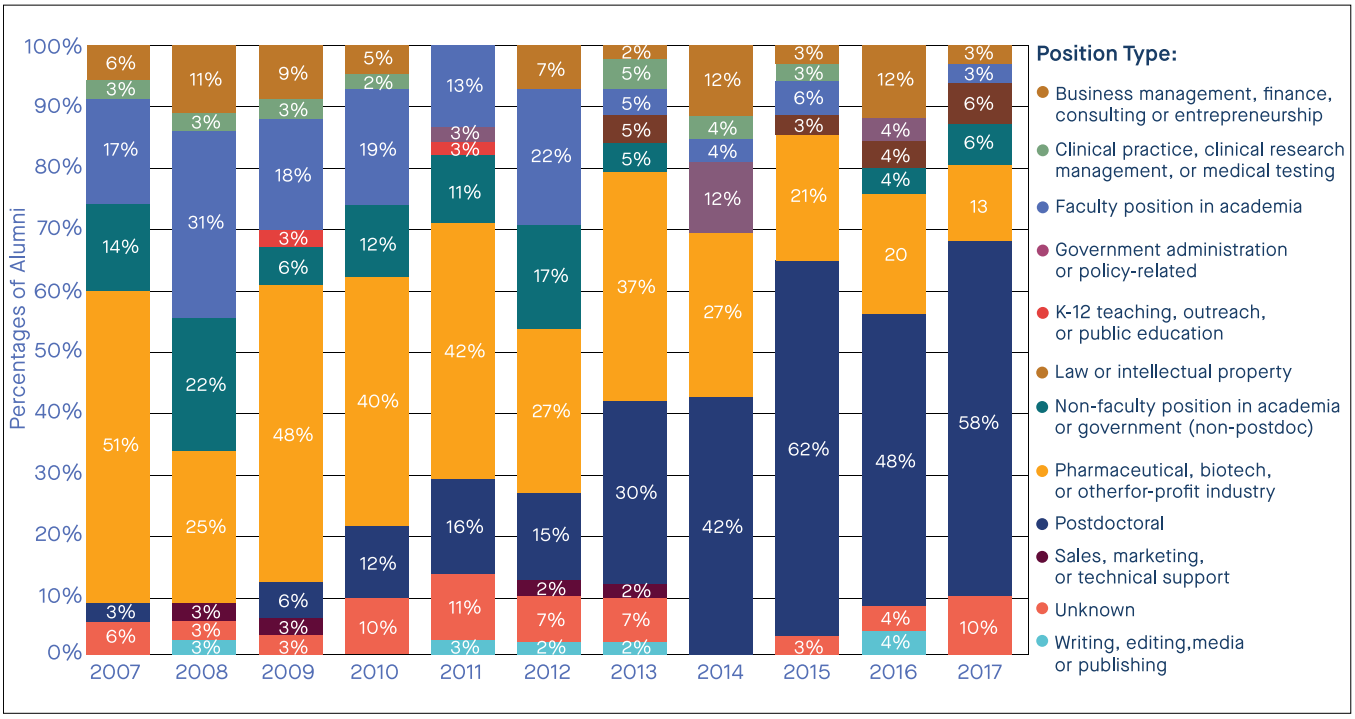
second largest category is 'faculty in academia' category. Many top academic institutions hire Graduate Program alumni into tenure-track faculty positions. Among them are: Berkeley; Brigham Young University; Cornell; Drexel University; Duke University; Grand Valley State University; Harvard; Harvey Mudd College; Indiana University; New York University; Rice University; Stanford University; University of Arizona; University of California, San Diego; and University of Montreal. Finally, a sizable percentage of Graduate Program alumni choose to put their writing, presentation, research, and critical thinking skills to good use in fields beyond industry or tenure-track research. Employers include Jones Day, McKinsey and Company; and the Food and Drug Administration.

Since the efforts to track alumni have occurred only in recent years, we do not have substantial long-term data about employment trends over time. We have observed that the percentage of scholars in the various categories varies little over time, and the number of alumni in postdoctoral positions decreases with time (**Figure 8**). More specifically, the number of alumni from the 2007 graduating class who are in the 'postdoctoral fellow' category is significantly less than the number of graduates from the 2014 class. We expect the trend line of alumni who are in 'postdoctoral' positions to continue to decline as the total alumni population increases in number and age into non-training positions. While we currently report career outcomes data on the entire alumni population, we aim to publish data for individual graduating classes to better understand employment trends, student interests, and more. To view the positions of alumni by graduation year in more detail, click on the title of **Figure 8**.

3.3 Integrity - Assessment to Ensure Objectives Being Met

Integrity in the Scripps Research Graduate Program is reflected in the order of the program requirements and the students' readiness for the next program step. The integrity is monitored and evaluated through the Program Review process (CFR 2.7). See **Figure 9** for the five steps of the Program Review process. During step

Figure 8: Alumni Position by Graduation Year 2007-2017

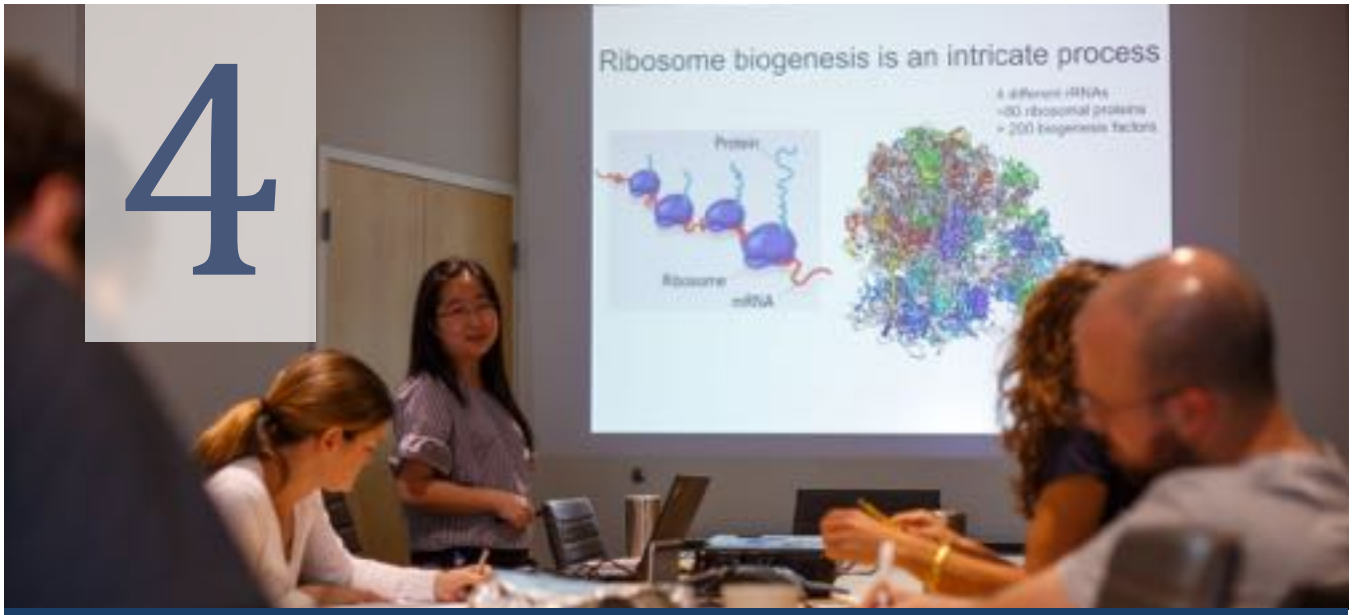


one, program faculty and administrators gather data that demonstrate how well the program is meeting its mission. The faculty identify who, where, when, and how data are collected, and the methods and processes used to analyze data. Data are gathered annually and presented at the Annual Bicoastal Meeting (July Meetings) or through the Annual Report. Quantitative and qualitative data are used to study and reflect on issues under review. Reflection occurs through committee meetings and through group discussions. After reviewing evidence and reflecting on next-step approaches, the best way to implement changes are flushed out and documented in an action plan. The Dean's approval is obtained, and the changes are communicated and implemented. The effectiveness of the implemented changes and action plans is assessed the following year through the self-study committees and the Deans Committee. Every 3-5 years, External Program Reviews (EPR) occur. The EPR includes a written EPR Report, external site visit, ERR Team Report, and culminates in a Scripps Research Response and Action Plan Report articulating the strategy for following up based on the external team's recommendations. The Deans Committee articulates the follow up action plan, budgetary needs, and the responsible committee and/or personnel who will hold the primary responsibility for carrying out each action.

This action plan is articulated in a written Response and Action Plan Report that acts as the future planning document for effecting change. (CFR 4.1-4.2)

Figure 9: Five-Step Process of Program Review





4

EDUCATIONAL QUALITY: Learning Outcomes, Core Competencies, and Standards of Performance at Graduation

4.1 Program Learning Outcomes

To ensure alignment between the program requirements and PLO's, the Graduate Office undertook a program-wide initiative to update the curriculum map. Now all course syllabi include course learning outcomes (or core competencies) and with the implementation of the new learning management system, Canvas, the CLO's will be mapped to the PLO's on the syllabi as well. The analysis of learning outcomes has also been extended beyond just the courses to the other critical components of the program. These experiences, both required and co-curricular, are also mapped to the PLO's and can be found in **Appendix 4-1.**

4.2 Student Learning

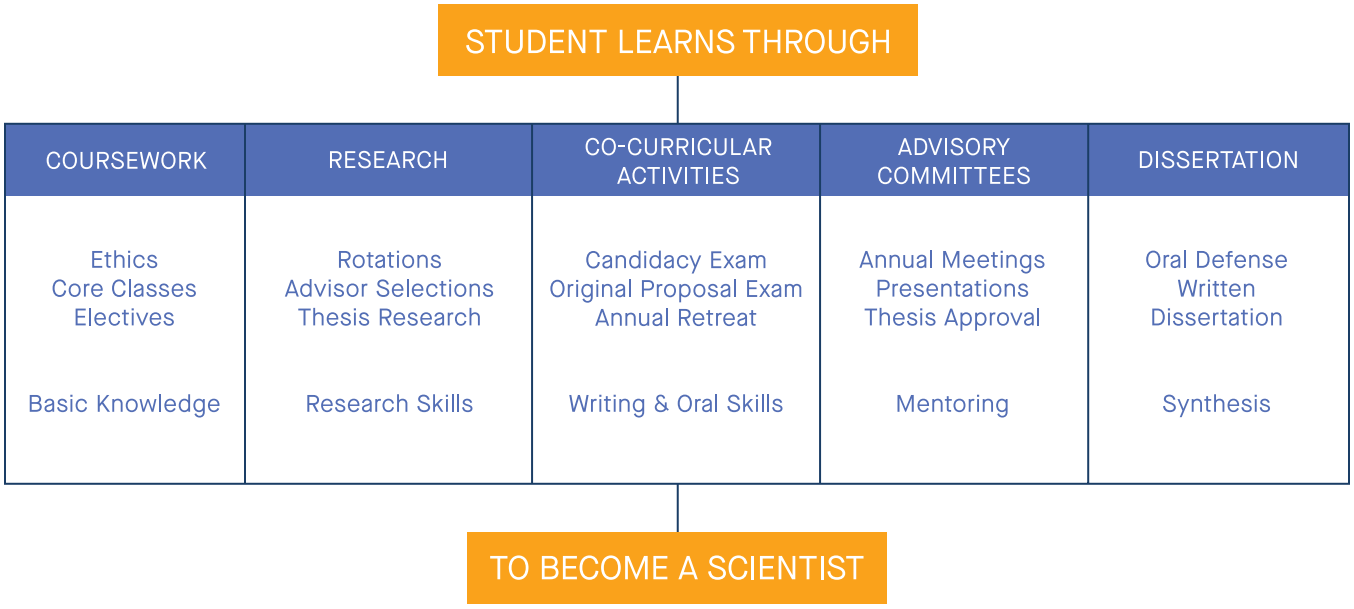
Institutions of higher education have a responsibility to document that students acquire knowledge and develop higher-order intellectual skills appropriate to the level of the degree earned. Graduate programs also set standards of performance, choose assessment methods, interpret the results, and act on findings in ways that make sense for the program and institution.

The Scripps Research Graduate Program requirements can be divided into five main categories of activities: coursework, research, advisory committees, co-curricular activities, and dissertation defense. Taken together, these requirements embody the essence of the program and the process by which new students master the PLO's and are trained to be scientists (**Figure 10**). (CFR 4.3-4.6)

More specifically, entering students initially focus on coursework during the first year with a goal of expanding their knowledgebase and/or extending their undergraduate education to the current frontier of knowledge. The thirty-nine courses taught by Scripps Research faculty on both campuses are grouped into areas of specialization or tracks that serve as a guide for students. Course selection is determined by the student's research interests. While students may choose courses within one track for focused studies, they are encouraged to develop a breadth of knowledge by taking courses from different tracks to form a customized program of study. Current tracks include: chemistry; chemical biology/ synthetic biology; molecular and cell biology; structural biology/biophysics; neuroscience; and immunology. A standard program consists of eighteen course credits.

While students are taking classes during their first year, they also participate in research through laboratory rotations. Rotations are a crucial part of a student's academic experience, providing an opportunity to spend 10-12 weeks, conducting research (or "rotating")

Figure 10: Five Program Requirements



in the laboratory of one or more Scripps Research faculty members. Laboratory rotations assist students in identifying the most interesting research and most suitable mentor with whom to complete their graduate studies. Most students select a thesis advisor by May 15 of their first year. At the end of each rotation, students are required to write a short report that outlines their accomplishments. Students are only required to do one rotation but can do as many rotations as needed to find their thesis laboratory. **Table 2** shows the average number of rotations per student over the last five years disaggregated by discipline. There is a difference between the biology and chemistry students, but it doesn't impact their time-to-degree. To view the rotation choices of the students in more detail, click on the title of **Table 2**.

Students formally join a research group for their thesis work by the end of their first year. Within six months of joining the thesis laboratory, students form an advisory committee consisting of four or five faculty members with expertise broadly related to their thesis work. These meetings are one of the most critical requirements of the program as students meet with the committee, demonstrate how they are meeting the PLO's, and then receive feedback on their research, critical thinking, communication, and intellectual skills. Every committee meeting consists of three components: (1) written summary of the project and its significance, results during the previous year including figures, flowcharts, and publications, and specific goals for the upcoming year; (2) oral presentation of the results generated during the previous year; and (3) discussion with the students – the advisors are asked to leave the room - about the advisor, laboratory mates, and research training. Students' progress toward achieving the aforementioned PLO's is assessed using rubrics, which are completed by the committee or the chair at the end of the meeting. The committee chair then summarizes the feedback to the student (CFR 2.12). The rubrics are then reviewed by the Graduate Office and the Deans for any needed intervention or guidance. Then students meet with the Graduate Office to discuss the rubrics and review next steps.

Table 2: Average Rotations from 2007-2017

Research Focus	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Biology	1.5	1.7	1.2	1.7	1.8	2.0	1.8	1.9	2.0	1.9	1.7
Chemistry	1.1	1.1	1.2	1.2	1.4	1.3	1.3	1.3	1.3	1.0	1.5
Average Total	**1.3**	**1.4**	**1.2**	**1.5**	**1.6**	**1.7**	**1.6**	**1.6**	**1.7**	**1.5**	**1.6**

Throughout the program, students participate in a number of activities, including scientific seminar series, journal clubs, scientific conferences, and the annual Graduate Student Symposium. These activities provide forums complementary to course and laboratory work for exchanging ideas and improving oral and written communications. After four or five years, the majority of students publish between two and five peer-reviewed scientific papers. Students are ready to graduate when they have generated peer-reviewed research, can develop creative approaches and methodologies to complex scientific questions, possess strong communication skills, and have mastered technical research skills. The oral defense of the written dissertation is the culmination of the entire process, where the student draws upon achievements and experiences which are synthesized in a dissertation. Examples of the final thesis work are available in the Graduate Office. (CFR 2.1-2.2b)

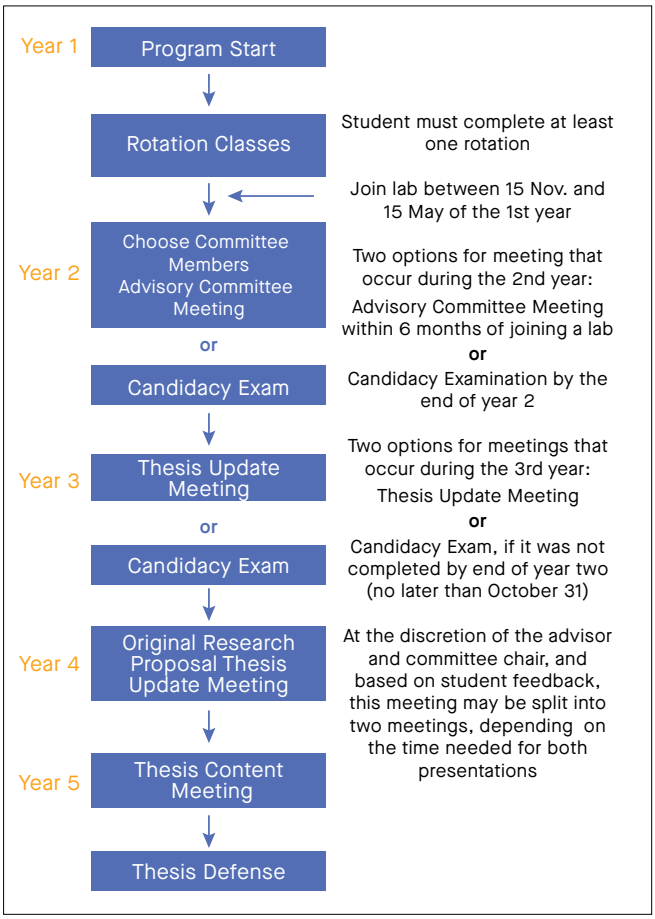
Below you will find several indicators of student success as defined by the Graduate Program and evaluated during the annual Internal Program Review (CFR 2.7). This includes annual committee meetings, candidacy examination, fellowships, and dissertations.

4.2.1 Committee Meeting Rubrics

The path to be a successful Ph.D. is through demonstrating one's ability to develop and demonstrate strong research, critical thinking, written and presentation skills, problem solving and technical skills. These PLO's are tracked longitudinally through rubrics that are completed by the student's advisory committee annually. The flowchart shown in **Figure 11** outlines the timing of the various committee meetings. The standard flow is: advisory (year 2); candidacy (year 2/3); thesis update (year 3); original research proposal (year 4); thesis content approval (years 4-5, if necessary); and defense (year 5). Students who fall outside of this timeline meet with the Director of Graduate Studies, one of the Graduate Program Academic Advisors, or one of the Deans to ensure that the student is making reasonable research progress.

Written feedback from the advisory committee is provided after all committee meetings through rubrics (CFR 2.12). During a student's advisory committee meeting, every student receives ratings from his/her advisory committee members based on the following PLO's: research skills; scientific writing; oral presentation; and proposal writing (only assessed in the Original Research Proposal meeting).

Figure 11: Committee Meeting Timeline



Each rubric consists of several dimensions, which are rated on a four-point scale of 1=emerging, 2=developing, 3=proficient, and 4=insightful. The expectation is that students will reach proficiency by the time they are ready to graduate. Copies of the rubrics can be found in **Appendix 4-2.**

When needed, the advisory committee recommends additional informal meeting(s) in-between the annual advisory committee meetings with members of a student's advisory committee. The student meets with one or more committee members to work through specific goals and plans for their research (CFR 2.12). Graduate Program administrators and the Deans are kept abreast to the outcome of these informal meetings and the student's progress. The student can also ask for an advisory committee meeting at any time over and above the regularly scheduled times.

In 2014, we piloted an initiative to normalize committee meeting conduct and outcomes. A member of the Graduate Office staff attended the committee meetings

to observe the proceedings and comment where appropriate. This has been met with mixed reviews from both faculty and students, but Dean Williamson (who stepped down in April 2017) enacted a new policy. By January 2018, a staff member was attending every committee meeting and ensuring that students were completing the requirements laid out by the committee. The Graduate Office staff member also summarizes the commendations and recommendations for the research and professional skills development (CFR 2.12). The committee chair then reviews the summary for completeness and accuracy.

Figure 12 shows when students are having the various meeting types. It illustrates that most of the students are able to follow the proposed timeline and stay on track to finish the program in a timely fashion. To view the rubrics in more detail, click on the title of **Figure 12**.

The Deans and Director of Graduate Studies review all rubrics and committee recommendations, communicate the committee's comments to the student, and connect students in need of additional support with the appropriate available resources.

Figure 13 presents the overall mean rating for writing, research and oral presentation rubrics by meeting type for all committee meetings from academic years 2009-2018. The data show that as students move through the program, their research, communication, critical thinking and analytical skills increase. This is reassuring, as program administration would certainly anticipate that students who have reached the later stages of their graduate education are more proficient in the PLO's than first- or second-year students. To view the rubrics in more detail, click on the title of **Figure 13**.

Figure 12: Year of Meeting Type

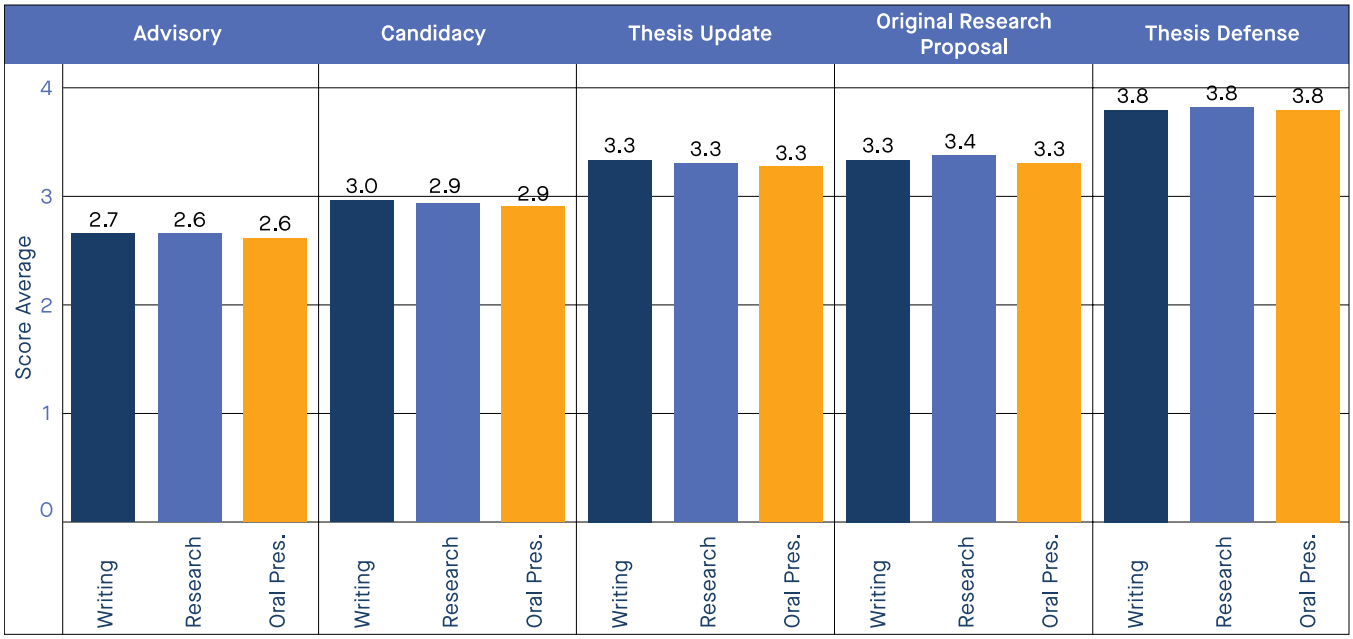
Meeting Type	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
1. Advisory	3	81	8					
2. Candidacy Examination	2	81	113	8	2			
3. Thesis Update	1	3	17	52	37	25	9	1
4. Original Research Proposal		2	11	64	105	17	2	
5. Thesis Content				1	36	12	6	1
6. Dissertation Defense		1	3		74	89	23	4

4.2.2 Candidacy Examination

The Candidacy Examination determines if the student has acquired sufficient knowledge of the area of study to merit admission into candidacy for a Ph.D. degree at Scripps Research. To make this assessment, the committee probes the student's ability to undertake and potential to complete doctoral research by examining a written thesis research proposal (Research Plan) and the student's defense of the proposal during an oral presentation of the thesis project as described in the Research Plan.

The Research Training Self-Study Committee evaluated the requirements for a successful Candidacy Exam and how to ensure standards of uniformity from student to student. The committee defines the Research Plan as a description of the student's project that must be formatted in the style of an NIH individual fellowship which contains six sections: (1) cover page; (2) specific aims; (3) significance; (4) innovation; (5) approach; and (6) references. The cover page and specific aims page are one page each, and the length of the significance, innovation, and approach is six pages including figures. The references should be comprehensive with no page limits. (CFR 4.5)

Figure 13: Rubric Ratings by Meeting Type



4.2.2.1 Assessment Criteria for Candidacy Examination

The committee reviews both the written and oral presentation from the student and assesses potential for Ph.D. candidacy based on the following criteria: (1) knowledge of research topic including relevant literature; (2) progress on the project over the pre-candidacy period; (3) suitability of the project for dissertation research; and (4) the potential of the student to develop and achieve success on this research project. While the specific progress necessary to merit acceptance as a Ph.D. candidate can vary across the diverse scientific disciplines within the Scripps Research Graduate Program; in general students passing the candidacy exam should have a significant grasp of the research relevant to their project and have made sufficient progress towards at least one publication that can be completed within a reasonable timeframe of a Ph.D. (4-6 years). The definition of "sufficient progress" varies depending on the student's field of study, but is generally embodied in one of the following examples: (1) establishment of a new synthetic schema with the initial steps completed; (2) clear evidence of an interesting biologic phenomenon that merits further study; (3) isolation and characterization of a protein for structure determination to answer an important biological question; or (4) quantifiable progress towards establishing a new organismal model to address an important biological question.

4.2.2.2 Candidacy Examination Outcomes

Based on the student's performance, the committee assigns one of the following outcomes (CFR 2.12):

- **PASS:** The student advances to Ph.D. candidacy
- **CONDITIONAL PASS:** The student is required to satisfy one or more conditions presented by the committee. Fulfillment of these conditions will require approval of the committee members but will not necessitate another meeting of the entire committee. Examples of conditions include, but are not limited to, rewriting the Research Proposal and/or becoming familiar with pertinent literature that was not presented or known during the Candidacy Examination.
- **DEFER:** The student is required to rewrite the proposal and prepare another oral presentation to the entire committee. This will require scheduling an additional meeting to satisfy the Candidacy Examination and allow progression to Ph.D. candidacy.
- **FAIL:** The committee must decide whether the student will be permitted to take a second candidacy examination; then the committee chair meets with the Dean and/or Director and the student's advisor to put the committee's wishes into action.

4.2.3 Pre-Doctoral Fellowships

The Graduate Program financially supports the first-year class. Starting in the second year, the faculty advisor

pays the student's stipend, tuition, and benefits from their grants or start-up funds. If the student receives a fellowship from a federal agency or research foundation, the student may be eligible for a stipend supplement. All students are encouraged to apply for fellowships, and programs are in place to assist and support our students with the application and application processes (e.g., Fellowship Boot Camp and Effective Scientific Communication courses taught by Professor Paegel). A list of fellowships that graduate students have had from the beginning of the program through November 2017 can be found in **Table 3.** To view the external fellowships in more detail, click on the title of **Table 3**.

4.2.4 Dissertation

The Research Training Self-Study Committee also reviewed the topics to be included in the dissertation. The topics of thesis criteria and quality were discussed, and revisions to the Guide for Thesis Production were generated. Changes include a statement of "what constitutes a good thesis," how to include published research in the thesis, and guidelines for attribution of collaborative work related to publications and/or to other thesis-related work.

A good thesis conveys a student's intellect, creativity, and aesthetic sensibility. Along with the student's research papers, recommendation letters, and CV, a Ph.D. thesis provides future employers, colleagues, employees, or students a document from which to draw judgments - positive and negative. It is a major portion of the student's extended self. (CFR 4.3-4.5)

The thesis includes:

1. Title Page
2. Copyright Notice
3. Thesis Acceptance Form
4. Dedication (if desired)
5. Acknowledgments
6. Table of Contents
7. List of Tables
8. List of Figures
9. List of Abbreviations
10. Abstract
11. Introduction
12. Problem or Question
13. Methods and Materials
14. Results
15. Discussion
16. Conclusion
17. Bibliography or References
18. Appendix: Spectra
19. Appendix: Publications
20. Curriculum Vitae

Additional information can be found in **Appendix 4-3**.

Table 3: External Fellowships Secured by Graduate Students

Funding Source	Number of Fellowships
NSF Graduate Research Fellowship Program (GRFP)	47
F31 NIH NRSA Fellowship	17
American Heart Association Predoctoral Fellowship	10
Natural Sciences and Engineering Research Council (NSERC)	6
Agency for Science, Technology and Research	5
Bristol Myers Squibb Graduate Fellowship in Organic Chemistry	5
American Chemical Society	4
California HIV/AIDS Research Program (CHRP)	3
F30 NIH NRSA Fellowship	3
Autism Speaks	2
Boehringer Ingelheim Funds	2
Fulbright Science and Technology Award	2
National Defense Science and Engineering Graduate (NDSEG) Fellowship	2
Royal Thai Government	2
U.S. Environmental Protection Agency	2
Agency for Science Technology and Research	1
Amgen	1
Andrea Elizabeth Vogt Memorial Award	1
Australia General Sir John Monash Award	1
Belgian American Educational Foundation, Inc	1
California Breast Cancer Research Program (CBCRP)	1
Chateaubriand Fellowship	1
Christine Mirzayan Science and Technology Policy Graduate Fellowship	1
Ecole Normale Superieure de Lyon	1
Eli Lilly	1
Ford Foundation	1
Glenn W. Bailey Graduate Fellowship	1
Helen Hay Whitney Foundation	1
Hertz Foundation	1
Irish Board for Training in Cardiovascular Medicine	1
ITO Foundation	1
Korea Foundation for Advanced Studies	1
Kwanjeong Educational Foundation	1
Landerberger Foundation	1
NIMH Program R36	1
Novartis Graduate Fellowship in Organic Chemistry for Minorities and Women	1
The Funai Foundation of Information Technology	1
The Kwanjeong Educational Foundation	1



5

STUDENT SUCCESS: Admissions, Student Support, Retention Rates, and Graduation Rates

There is some debate on how to define and measure student success. At first glance, it seems simple: a successful student is a first-year who enrolls in the program; persists through the terms; and then progresses to degree completion in a timely fashion. The routes that students take, however, are unique and rarely straightforward.

To tackle this issue, the Scripps Research Graduate Program defines student success as: admissions rates, retention rates, graduation rates, time-to-completion, and academic performance. This section unpacks these metrics.

5.1 Admissions

The first step in admissions is attracting the appropriate students to apply. Historically, Scripps Research has accomplished this goal through its faculty who are internationally renowned in chemical and biological research. Students generally apply with the singular purpose of studying with 1–3 Scripps Research faculty members, and typically in one of the key areas of research strength (immunology and microbiology, structural biology, molecular medicine, neuroscience, and chemistry). **Figure 14** provides a schematic overview of the stages of the admissions process.

Applicants know the Scripps Research brand either through the scientific literature or their undergraduate scientific research mentors. Students also tend to apply based on the U.S. News ranking of the chemistry and biology programs at Scripps Research, which rose meteorically in the 1990's into the nationwide top 10 (see **Appendix 5-1** for US News & World Report rankings). More recently, the Graduate Office has engaged in more proactive efforts to attract applicants by hosting booths at career fairs and facilitating Scripps Research faculty giving lectures at targeted institutions. These activities are particularly geared at institutions in the Southeast and Midwest proximal to the Jupiter campus, historically black colleges and universities (HBCUs), primarily undergraduate institutions (PUIs), and other institutions where the student body may not be aware of the Scripps Research name by way of its unconventional nature.

5.1.1 Bicoastal Admissions Committee and its Subcommittees

The second step in admissions is identifying the most promising applicants. Each year, the Graduate Program receives approximately 750 applications from applicants across the globe (**Figure 15**). A bicoastal Admissions Committee reviews application to determine the most suitable applicants.

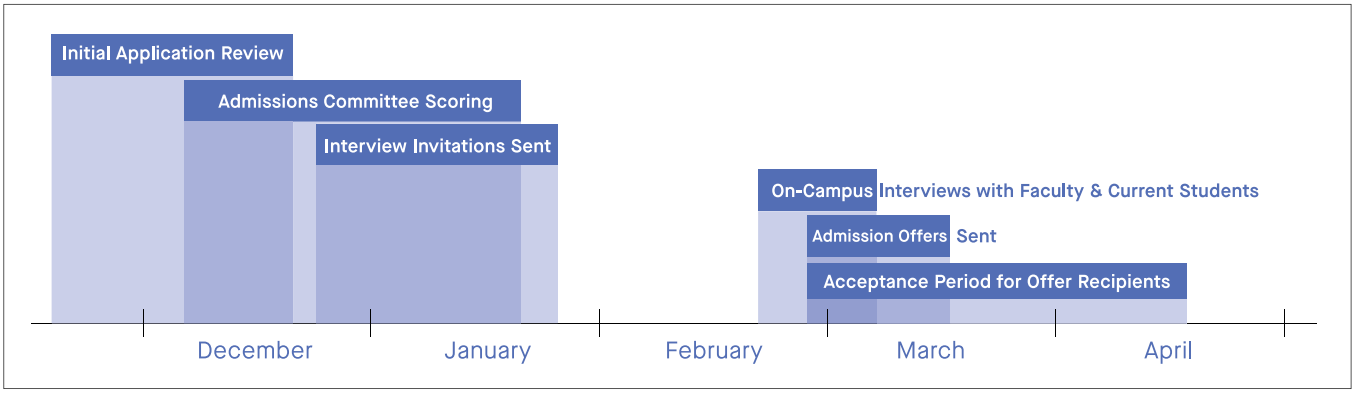
The California Admissions Committee consists of approximately fifteen diverse faculty covering the broad research areas represented at Scripps Research. Committee members on the California campus form two subcommittees: (1) one reviews chemistry, chemical biology, and structural biology/biophysics applications; and (2) one reviews immunology, neuroscience, computational biology, molecular biology and other biology areas. The two subcommittees closely coordinate through interactions between the subcommittee chairs, two common members, the Online Admissions System (OAS), and the Graduate Office staff. Subcommittees meet several times in December and January following the December 1 application deadline to review the hundreds of applications and select applicants for campus visits and interviews.

The Florida Admissions Committee consists of approximately ten faculty that variously review applications by focus: (1) one reviews chemistry and chemical biology applications; (2) one reviews basic, applied, and computational biology; (3) immunology, and microbiology; and (4) neuroscience. The Florida Admissions Committee meets virtually several times in December and January.

5.1.2 Admissions Review Process

A critical part of the review process is identification of the most appropriate campus for the applicant which the committee determines based on the applicant's stated research interests. Admission standards are the same for the California and Florida campuses.

Figure 14: Schematic Overview Showing Different Stages of the Graduate Admissions Process



An initial review of the applications by the Graduate Office staff begins as applications are submitted during the fall of each year. Following the submission deadline of December 1, the Admissions Committees convene a series of meetings, in person or virtually, to review applications and select applicants to move to the interview phase.

The OAS holds all the application materials and provides an easy way for commenting on and scoring the application. Materials and comments are available to all members of the Admissions Committee on both coasts through OAS.

The Admissions Committee meet in-person or online to review the applications. These meetings are conducted in a manner roughly analogous to a proposal review panel process. Prior to each meeting, a subset of completed application is assigned to at least three faculty members for careful reading, review, and scoring. Scoring is on a 1-3 scale with one representing outstanding (top candidate), two representing average, and three representing non-competitive (unfit for Scripps Research).

Committee members review, score, and add key review comments to the OAS. Committee co-chairs and members also forward applications to other faculty or perform additional reviews as needed before the meeting.

During the review of each application, the committee considers a broad range of information. The committee ultimately seeks to identify candidates who will thrive in the unique research-focused learning environment at Scripps Research. Information reviewed for each candidate includes:

- Statement of purpose;
- Statement of research experience;
- Research interests match with Scripps Research laboratories;
- Academic and employment history;
- Academic transcript(s);

- Recommendation letters from undergraduate faculty mentors and employers;
- Publications;
- GRE General and Subject scores; and
- Subject and diversity balance.

During in-person meetings, as each applicant is brought up for discussion, individual committee members assigned to the application discuss strengths and weaknesses that influenced their comments and scores. Other committee members look over the application and add discussion points in four major areas: (1) core competency of undergraduate coursework and training (course work choices, GPA, GRE, post-bac, major); (2) letters of recommendation can provide an informed perspective on applicant and their contributions, both intellectually and technically, to research projects; (3) research statement is evaluated for research outcomes, critical thinking, clarity of writing, and conclusions drawn; and (4) statement of purpose can provide information about suitability for graduate school at Scripps Research and awareness of research programs at Scripps Research. While the initial scoring provides a very good basis, final committee selections for campus visits are made based on detailed discussions and interactions where additional points may arise.

By the middle of January, the Graduate Office sends out invitations to approximately 19-27% of applicants (invitee numbers have been approximately 120 invitations to the California campus and approximately 60 to the Florida). A very small number (< 10) receive an invitation to interview at both campuses (**Figure 15**). Between the time that invitations are sent and the campus visits, committee members or potential faculty of interest are encouraged to make email contact with applicants. This contact is open-ended and seeks to identify any specific issues or concerns that could be addressed before or at interview. Most invitees accept invitations and send an updated list of faculty of interest for meetings and interviews during the visit. Using information from the committee members and invitees, a schedule is drawn up for student meetings with individual faculty members during their visits. All Graduate Program faculty are encouraged to be involved in the interview process. The greater the engagement, the more likely the invitees are able to speak with potential faculty mentors and have their questions answered and their sense of compatibility satisfied.

The final step of admissions is interview and recruitment. Students receiving an invitation to interview are required to attend the interview weekends for in-person interviews with faculty and interactions with current graduate students. The interview weekends consist of the following schedule (see **Appendix 5-2** for a sample):

Thursdays – students arrive to campus, and have dinner with student hosts or faculty;

Fridays – Students have a detailed overview with Graduate Program administration, 30-minute meetings with individual faculty, lunch with faculty, and dinner with faculty, current students, Deans, and Graduate Office staff. Some free time is also available for students to schedule additional 1-2 meetings with faculty/laboratory.

Saturdays – Students have a more relaxed schedule starting with a brunch with faculty, current students, Deans, and follow with social activities, and dinner.

The visits provide an opportunity for faculty, current students, and invitees to assess the match and fit with the program. During the interview, faculty try to garner a sense of research prowess and intellectual aptitude for research-based learning as well as probe the applicant's interest in Scripps Research. The faculty seek to draw out any questions or concerns the applicant may have about Scripps Research and the process of undertaking graduate training here.

All faculty and committee members who meet with students (either during formal meetings or during lunch/dinner) are invited to provide feedback and scores. The committee meets soon after the visits to make final decisions on acceptance offers. At this meeting, the committee considers all additional feedback and information from the visits and interviews to make final decisions on fit of applicants for the program and selection for admittance.

Following the committee meeting, applicants who exhibit excellent grasp of scientific concepts, passion for scientific discovery, collegiality, and fit for the program receive an offer of admission (19-27% in recent years). The offers are sent early in March, and students have until April 15 to make decisions. During this period, faculty with specific interest in a candidate are encouraged to reach out, endeavoring to recruit these top students to the program and plan for laboratory rotations. Candidates are also put in touch with additional faculty they may not have had a chance to interact with during the visits.

By April 15, candidates convey their decision to the Graduate Office. The yield rate (compared to the number of admitted candidates) is roughly 30-39% (66 students enrolled in 2018). These top applicants are applying and receiving acceptance from top-flight peer institutions (e.g., Berkeley, Caltech, Harvard, JHU, MIT, Michigan, Rockefeller, Stanford, UCSF, UT, UTSW, Vanderbilt, Wisconsin, and others), so competition is fierce.

The Graduate Program continues to be highly selective

in generating offers of admission and successful at recruiting those who receive offers. From 2012 to 2017, the program enrolled 43-63 students each year as reflected in **Figure 15**.

Transfer students who are in good standing in their current Ph.D. program may be considered for transfer. These students are provided individual counseling from the Director of Graduate Studies. Transfer applications are reviewed by the Admissions Committee. Any credits that will count toward the Scripps Research degree are reviewed and determined by the Director of Graduate Studies. Transfer students are expected to have their first advisory committee meeting within one year of joining the Scripps Research Graduate Program. (CFR 2.14). To view the admissions statistics in more detail, click on the title of **Figure 15**.

5.2 Retention Rates

Since its inception, the Scripps Research Graduate Program has worked very hard to retain its students. A high retention rate can be interpreted to mean that the student has a high-level of attachment to the education they are receiving, the professors, the research, and the campus.

Graduate students are placed in a cohort when they matriculate into the Graduate Program. Each cohort encompasses students who were accepted during the most recent admissions cycle through the next admissions cycle. The number of students in the cohort is then used as the denominator when calculating the retention rates. Retention rates are the percentage of students in a cohort enrolled in the fall of the prior year that are still enrolled in the fall of the current year.

Figure 15: Admissions Statistics: Applied, Admitted, and Enrolled Applicants from 2012-2017

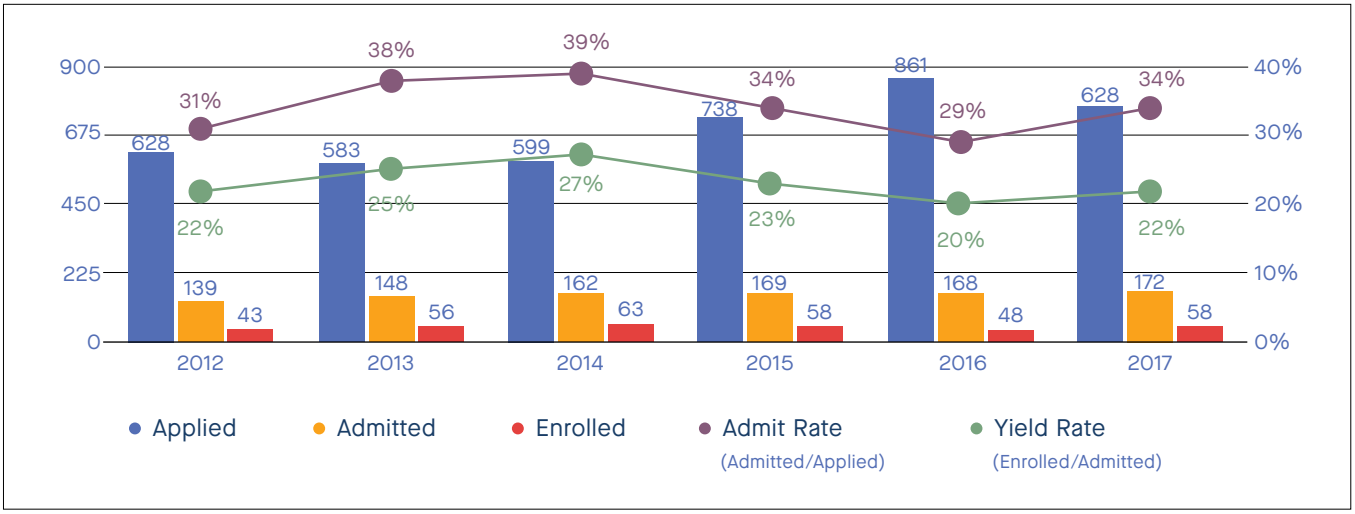


Table 4 presents retention rates by cohort from 1997 thru 2017. Traditionally, retention rates are shown through year three for Ph.D. programs. Here we present data through the graduate degree process for a solid view of trends. Retention rates have remained strong with 96% of student retained after the first year and 89% retention at the end of the third year. The data illustrate that there is no significant difference in retention based on gender, ethnicity, or citizenship. (CFR 1.2) To view the retention rates in more depth, click on the title of **Table 4.**

5.3 Graduation Rates

Closely related to retention rates are graduation rates, which are the percentages of student cohorts who sought and achieved a degree within a specified timeframe. Graduation rates use the same denominator as the retention rates. Our graduation rates reflect two types of students: (1) those who started and finished at Scripps Research; or (2) those who transferred into the Scripps Research's Graduate Program. **Table 5** shows the graduation and time-to-degree rates for students from 1997 through 2017. Our average time-to-degree rate is 5.3 years which is shorter than the national average is 6.7 years. (CFR 1.2) To view the graduation rates in more depth, click on the title of **Table 5**.

5.4 Support – Academic

Retention, graduation, and time-to-degree rates assist institutions in determining how many students progress with satisfactory academic results and help to uncover

Table 4: Retention Rates for all Students: Cohorts 1997-2017

Year of Entry	Cohort Size	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
1997	28	100%	96%	96%	96%	96%	96%	96%
1998	34	94%	85%	79%	79%	79%	79%	79%
1999	33	91%	85%	82%	79%	79%	79%	79%
2000	23	96%	91%	91%	91%	91%	91%	91%
2001	38	97%	97%	95%	92%	92%	92%	92%
2002	35	100%	97%	91%	91%	91%	91%	91%
2003	53	98%	94%	92%	91%	91%	89%	89%
2004	46	100%	100%	100%	98%	98%	98%	98%
2005	37	97%	92%	92%	92%	92%	92%	92%
2006	48	96%	92%	90%	90%	90%	90%	90%
2007	36	100%	97%	94%	94%	94%	94%	92%
2008	59	90%	86%	78%	75%	73%	71%	69%
2009	30	97%	93%	93%	93%	93%	93%	93%
2010	31	97%	87%	87%	87%	87%	87%	87%
2011	40	98%	90%	85%	85%	83%	83%	83%
2012	41	98%	95%	93%	90%	90%	88%	NA
2013	49	98%	90%	88%	88%	82%	NA	NA
2014	58	93%	83%	81%	76%	NA	NA	NA
2015	60	98%	97%	97%	NA	NA	NA	NA
2016	44	98%	95%	NA	NA	NA	NA	NA
2017	58	97%	NA	NA	NA	NA	NA	NA
2018	61	NA	NA	NA	NA	NA	NA	**NA**
Total	**942**	**97%**	**92%**	**89%**	**87%**	**88%**	**88%**	**87%**

why students leave institutions. Scripps Research provides a wide array of services to support the whole student.

This support is offered and delivered in several ways through various offices and departments at Scripps Research. Some of the academic services are described here. (CFR 2.10-2.11, 2.13)

5.4.1 Scripps Research Libraries

The Scripps Research Libraries serve the information needs of the Scripps Research community and neighboring Scripps Green Hospital. The libraries collect materials in the fields of clinical medicine, molecular biology, cell biology, chemistry, biochemistry, immunology, and neurobiology in support of the Institute's mission of teaching, research, and improving human health. The book collection numbers approximately 5,000, with about 1,000 eBooks, and the libraries subscribe to approximately 4,700 journal titles. A noncirculating Graduate Reserve collection is available for use by Scripps Research graduate students. The libraries are fully automated using the Worldshare Management Services from OCLC. Bibliographic retrieval is available from databases accessible on Scripps Research's intranet. The library on the California campus has undergone major renovations and now offers computers and spaces that reinforce collaborative learning with several small meeting spaces with computers and screens. Both the California and Florida library are critical

Table 5: Graduation and Time-To-Degree for all Students: Cohorts 1997-2017

Year of Entry	Cohort Size	Year 4	Year 5	Year 6	Year 7	Year 10	Mean Time-to-Degree
1997	28	7%	39%	89%	96%	96%	5
1998	34	3%	32%	74%	79%	79%	5.1
1999	33	18%	36%	67%	79%	79%	5.1
2000	23	13%	35%	87%	91%	91%	4.9
2001	38	13%	42%	76%	92%	92%	5.1
2002	35	6%	29%	71%	83%	91%	5.2
2003	53	9%	36%	75%	85%	89%	5.2
2004	46	13%	33%	67%	87%	98%	5.4
2005	37	3%	27%	68%	81%	92%	5.6
2006	48	4%	21%	67%	77%	90%	5.6
2007	36	17%	31%	78%	92%	92%	5.2
2008	59	2%	22%	53%	66%	69%	5.5
2009	30	7%	47%	77%	87%	NA	5.2
2010	31	10%	35%	77%	84%	NA	5.1
2011	40	10%	35%	65%	78%	NA	5.1
2012	41	2%	34%	71%	NA	NA	5
2013	49	0%	24%	NA	NA	NA	NA
2014	58	0%	NA	NA	NA	NA	NA
2015	60	NA	NA	NA	NA	NA	NA
2016	44	NA	NA	NA	NA	NA	NA
2017	58	NA	NA	NA	NA	NA	NA
2018	61	NA	NA	NA	NA	NA	NA
Total	**942**	**7%**	**32%**	**71%**	**83%**	**87%**	**5.2**

academic and social hubs for individual research and study.

In 2017, graduate students checked out 179 books and completed 1216 interlibrary loan requests.

The library offers several important services and programs focused on educating students on the collection and evaluation of information in a variety of formats. This would include finding relevant resources for the students' research; identifying strategies for staying current in the field, providing guidance on managing your professional research identity and scholarly metrics; and supporting dissertation research. More specifically, the library offered workshops in Reaxys, Endnote, BrowZine, ChemDraw, and Web of Science.

5.4.2 Career and Postdoctoral Services Office

The Career and Postdoctoral Services Office (CPSO) at Scripps Research provides academic services and programs to all graduate students and postdoctoral fellows to prepare them for a range of professional endeavors and to support their research training during their time at Scripps Research. The office offers a diversity of programming, including workshops focused on both academic needs and career-related skills, all of which feature a variety of discussion and workshop topics. Specific programs include: The Academic Job Search; Fellowship & Grant Writing; Oral Presentation; Career Adventures Beyond the Bench; Academic Careers Roundtable; Scientific Writing; Transitioning to Industry; and a 2-day Laboratory Management and Leadership

Symposium. On-camera practice interview sessions are offered regularly. Copies of full CPSO reports can be found at **Appendix 5-3**. In all, more than 50 professional development programs are offered annually.

Additionally, the Institute makes several IDP templates available and encourages trainees to speak with their advisors early and often about laboratory obligations, academic and research goals, skills development, and career planning. These forms are distributed at orientation and are available from the Career and Postdoctoral Services Office.

The office also offers individual career counseling appointments and maintains a dedicated career resources library for postdoctoral fellows and students, which features career development literature and computer access. The CPSO website features a wealth of resources for academic and non-academic careers, current information about funding opportunities and proposal writing resources, descriptions of numerous on-campus professional development workshops, links for alumni networking, and handouts and videos from past career workshops. The website includes information for new postdoctoral scholars and graduate students, including tools for planning and structuring an effective training experience.

Trainees can take advantage of a free in-house peer review service to help them write high quality papers and fellowships. Postdoctoral fellows and senior graduate students volunteer to be peer editors and review requests are routed to editors based on expertise and availability.

5.5 Support – Social

The Graduate Office regularly offers community-building activities and programming throughout the year, at least once a month. Collaborations with the Counseling and Psychological Services, the International Services Office, and the local Humane Society have been very fruitful and will continue. In addition, student feedback and participation are essential in this area, and our partnership with the Graduate Student Councils will continue as they are increasingly interested in fostering and focusing on student well-being and success.

5.5.1 Office of Graduate Studies

Nature Biotechnology cites that work-life balance is correlated with both physical and mental well-being. The Skaggs Graduate School recognizes that a commitment to scientific research is a top priority for successful doctoral candidates. The program also asserts the importance of balancing research with key social interactions that establish a sense of community, foster teamwork, and serve as creative outlets. Various community building activities and social programming such as kickball, yoga, and peer coaching are offered throughout the year and are a collaborative effort with the Graduate Student Councils, outside organizations, and various departments across the Institute. Below are three different initiatives (peer coaches, yoga, and kickball) that support the students' social needs.

We have seven peer coaches in California and five in Florida who are available to assist first-year students with navigating the graduate program and a new city. Students can reach out to peer coaches on an individual basis, in group settings, and during panel events.

Recently, on the California campus there was a breakfast event to reconnect peer coaches with their mentees after two months in the program. They focused on issues within courses, laboratory rotations, and acclimating to graduate school.

Throughout the fall 2018 term, the Graduate Office offered yoga classes for graduate students. Whether students attend for physical or mindfulness purposes, this is another activity to highlight the importance of self-care for graduate students.

Playing on the "Scripps Kicks" kickball team has been a great outlet for graduate students - we are getting exercise, learning how to work as a team, and building relationships. This is an opportunity for students to express their competitive side while having fun. Twenty Scripps Research graduate students play for the Florida team. (CFR 2.10-2.11, 2.13)



5.5.2 International Services Office

Scripps Research attracts scientists from all over the world who join the effort to solve some of the greatest challenges in biomedical sciences. Nearly three in four postdoctoral fellows and 35% of Scripps Research's doctoral students are foreign nationals.

In 2017, Scripps Research hosted approximately 850 international students and scholars at the California and Florida campuses. These researchers come from 65 countries on every continent, spanning nations as diverse as Albania and Australia, Switzerland and South Africa. The top 10 countries represented at Scripps Research, in descending order, are China, India, Japan, Germany, Canada, South Korea, Spain, Italy, France, and Taiwan.

To support F-1 and J-1 students and scholars, Scripps Research has an International Services Office (ISO) that prepares immigration documents and offers advice on employment authorization. ISO's mission is to provide comprehensive, professional, and individualized immigration and support services in a welcoming environment designed to actively promote international exchange and further the research and training goals of Scripps Research. ISO also maintains a robust website which contains a great deal of information for the international scholars, students, and their families. (CFR 2.11)

Examples of the social programs include:

1. International Spouses and Partners Group – ISO offered international spouses' group meetings on both campuses in collaboration with the Counseling and Psychological Services Department.
2. International Women's Day – ISO partnered with NWiS for the first time to host a lively discussion for International Women's Day in March.
3. Cultural Celebrations – ISO Florida worked with international volunteers to offer both a Chinese New Year's celebration in January and a Diwali Celebration in October. ISO California hosted an International Holiday Party for international scholars and their families.
4. National Postdoc Appreciation Week (NPAW) – ISO worked with CPSO in California to offer a joint Open House with international flair, and CPSO collaborated with ISO in Florida to host another popular ice cream social.

Copies of full ISO reports can be found at **Appendix 5-4**.

5.5.3 Student Organizations

We endeavor to make the student experience in Scripps Research's Graduate Program extremely rich and rewarding. However, there are a lot of stresses and pressure placed on graduate students. Graduate Program administration has put in place several ways for students to seek help and guidance with issues of coping with a new environment, dealing with difficult situations, and navigating life's challenges in a competitive scientific arena. For a full list of the clubs and organizations available on the two campuses, see **Appendix 5-5**. Below you will find more information about how the Graduate Student Councils, the Scripps Research Outdoor Club, and National Woman in Science (NWiS) are supporting Scripps Research graduate students.

5.5.3.1 California Graduate Student Council

The California Graduate Student Council (GSC) is a student-run organization at Scripps Research that advocates for the interests and well-being of graduate students. The Council consists of representatives from the student body. Each year, the student body elects an executive board that serves on the Council for one calendar year. The GSC conducts yearly surveys on student satisfaction and works with the Graduate Office to recommend and promote policies that are beneficial to student life on both the California and Florida campuses.

In the last two years, the GSC has accrued several notable accomplishments including:

- Initiated reform of the sexual harassment policy and infrastructure for addressing concerns. The new policy is designed to offer a more transparent and accessible process for students, faculty and employees at Scripps Research;
- Successfully advocated for a student stipend increase as well as the expansion of funding allowance for conference-related travel and research-related expenses; and
- Recommended increased transparency in the Graduate Office regarding student affairs and increasing Graduate Office representation at student committee meetings.

5.5.3.2 Florida Graduate Student Council

The Florida Graduate Student Council is comprised of graduate students whose goal is to improve the life of students and facilitate communication between the students and Graduate Program administration. The committee primarily focuses on issues pertaining to student life, including: extracurricular activities;

resources; student recruitment; facilities; and policies and procedures.

Seminar achievements in the last two years include:

- Established a monthly graduate student journal club for the Florida campus;
- Requested and secured a graduate student study area;
- Advocated for participation in identifying new Graduate Office staff members on the Florida campus.
- Worked collaboratively with the California GSC on a sexual harassment policy

5.5.3.3 Scripps Outdoors Club

Students on the California campus take advantage of being in San Diego, where the weather makes it possible to be outside year-round. Camping, hiking, kayaking, surfing, and other outdoor activities are great ways to get in touch with nature and leave behind the stresses of daily life – something needed during a Ph.D. program. With experienced leaders planning expeditions for any skill level, combined with loaning club-owned gear, any student (or postdoc) can become involved in the club. The Scripps Research Outdoors Club serves as a venue for students from all years and fields of research to meet in a relaxed fashion, talk about their science, and increase the potential for unique collaborative ventures across disciplines. Membership to the club is free for all members of the Scripps Research community as is usage of club gear.



5.5.3.4 Network for Women in Science

The Network for Women in Science on the Florida campus was established to help build a sense of community among the women, to network and receive support, and to create a place for discourse on women's issues (including balancing career and family and selecting a career path).

Their activities include:

- Networking with female leaders in science and alternative careers;
- Professional development workshops/seminars;
- Female faculty lecture series;
- Book club;
- Panel of women Ph.Ds. in non-academic science career positions; and;
- Social events.

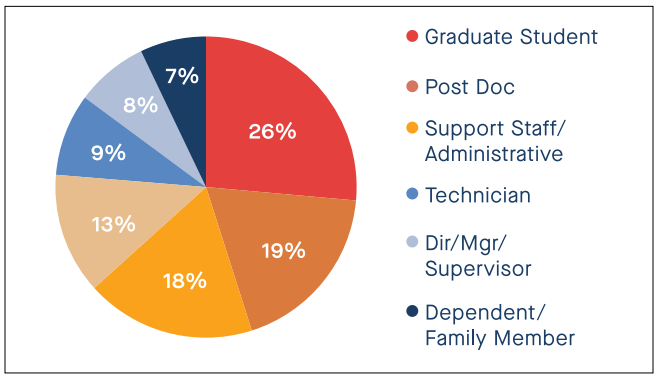
5.6 Support – Health & Wellness

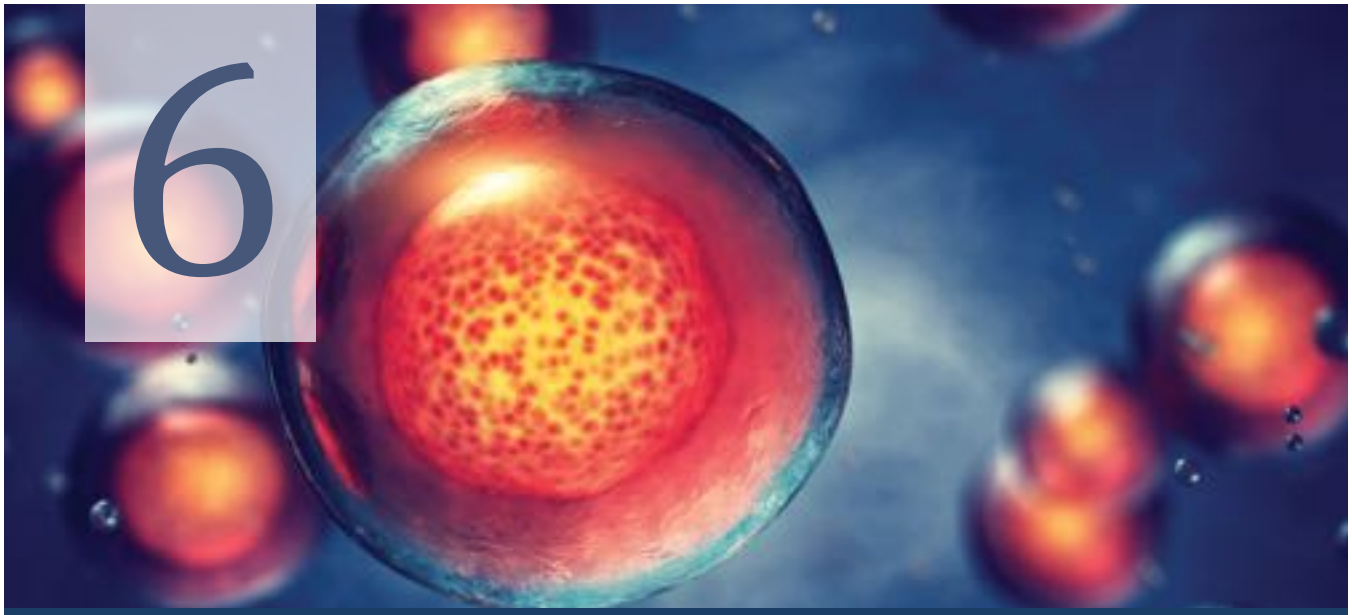
The Counseling and Psychology Services (CAPS) Department is a bicoastal department that services both campuses. In 2017, CAPS provided services to 185 clients for a total of 1336 sessions and Lunch and Learn workshops on topics such as: "Self-Compassion," "How to Overcome Shyness," and "Singing the Blues: Managing Depression" were offered with successful attendance.

The CAPS counselors also facilitated four discussion groups for the Scripps Research community: "Spouses and Partners" groups were provided on both the California and Florida campuses; an "Overcoming Perfectionism" group was offered on the California campus; and a "Gratitude" group was offered on the Florida campus.

According to the CAPS annual report, their services were utilized extensively by graduate students and postdoctoral fellows. In 2017, 18% of the graduate student population and 8% of postdoctoral fellow population sought CAPS' services. These totals reflect approximately one-half of CAPS clientele. **Figure 16** shows the job codes of all the CAPS clients and illustrates that 26% of CAPS' clientele are graduate students, while 19% are postdoctoral fellows. A copy of the full 2017 CAPS annual report can be found at **Appendix 5-6**.

Figure 16: Usage of CAPs Services by Title





6

QUALITY ASSURANCE IMPROVEMENT: Program Review, Assessment, Use of Data

6.1 Program Review

Even before Scripps Research had a formal Program Review policy, Scripps Research was meeting regularly and evaluating the program. Since the most recent accreditation, Scripps Research is making a concerted effort to meet and record all evaluation and assessment activities. We are much more intentional about our work. Below is a subset of Scripps Research's more important accomplishments achieved through the Program Review process. They include: bicoastal integration; curriculum improvements; Individual Development Plan (IDP's); technology development; website optimization; and institutional research.

6.1.1 Bicoastal Integration

Starting in 2014, the Graduate Program implemented an annual Internal Program Review on the Florida campus. Dubbed the July Meetings, several California faculty members were invited to travel to the Florida campus to participate in the bicoastal meetings and build bicoastal research collaborations for their own research programs. The topics covered in the July Meetings would vary from admissions, professional development, curriculum, faculty mentoring, and outreach.

Over the last four years, the following faculty have traveled to Florida: Philip Dawson, Ph.D.; Olivier George, Ph.D.; Wendy Havran, Ph.D.; Anton Maximov, Ph.D.; Glen Nemerow, Ph.D.; Floyd Romesberg, Ph.D.; Ian Wilson, D.Phil. (Curriculum Chair); and Dennis Wolan, Ph.D. Many other faculty from both campuses participated in the review through the VTC technology and direct participation by Florida faculty.

6.1.2 Evaluation of Foundation Curriculum

There was real interest on the part of Graduate Program administration, faculty, and students to determine if the Graduate Program courses were meeting the needs of the students, while taking advantage of the faculty's expertise. Restructuring existing courses, such as Immunology and Molecular Biology, were part of the evaluation to ensure that critical content is presented, there is cohesiveness and alignment within a course and between courses within the same discipline, and updated pedagogy and technology are used to deliver the courses. The Curriculum Committee was tasked with developing a course review process that ensured that every course is evaluated every 3-5 years. They started by dividing all the current courses and recently sunset courses into research disciplines that would be evaluated

by curriculum subcommittees. **Table 6** shows how the courses were subdivided. Then each subcommittee met and evaluated their subset of courses.

The objectives of each subcommittee were to provide a thorough examination of the goals, implementation, and outcomes of their courses. In the context of those objectives, the subcommittees sought to identify problems with the curriculum or where improvements could be made. When identified, remediation was recommended, or further study undertaken. Achievement of this goal required an analysis of the topics covered in the courses. Particular attention was paid to the pedagogical methods implemented in each of our courses, the balance of those methods between courses and the extent to which those experiences foster critical thinking, enhance verbal and written communication skills, and provide broad exposure to research methodologies and data analysis. (CFR 4.4, 4.6)

The review focused on Course Learning Outcomes (CLO's) and their alignment to the PLO's, course/lecture topics, pedagogy, faculty instructors, timing of all the courses in the groupings, examinations and other mechanisms by which students demonstrate mastery of course material, previous evaluations, and current evaluation tools. The findings of the subcommittee were then documented in a report.

The report outline established by the Chair of the Curriculum Committee, Prof. Ian Wilson, included the following:

1) Introduction of committee members and course overview by directors;
2) Objectives of the sub-curriculum committee;
3) Evaluate the effectiveness of the courses under review by the sub-curriculum committee;
    a) Enrollment of students
    b) Do the courses, individually or as a group, cover the breadth of topics relevant to the understanding of contemporary issues both in terms of theory and technique?
    c) Do these courses lay a good foundation for more advanced or subject-specific courses offered in the curriculum?
    d) Do the courses provide an entry to the advanced courses most likely to attract those graduate students who know what they want to study?
    e) Do the courses cover contemporary topics?
    f) Do the courses expose the students to topics they may not have considered to facilitate the identification of their own scientific path?
    g) Is there significant overlap in content between these courses or of these courses with survey courses in other disciplines?
    h) Do these courses, as a group, maximize the bicoastal communication resources available at the two campuses?
    i) Do these courses as a group fully utilize the expertise available at the two campuses and do they provide student exposure to a broad range of faculty?
4) Discuss effective methods for obtaining course feedback from students;
5) Discuss effective methods for providing feedback and evaluations to students;
6) Identify problems with the curriculum; and
7) Recommend study and/or remediation of problems identified in the curriculum.

Below are three examples of reviewed curriculum: (1) immunology; (2) structural biology; and (3) neuroscience. For reviews of chemical biology and fundamental biology curricula, see **Appendix 6-1.**

6.1.3 Immunology Curriculum

A series of Immunology Curriculum Subcommittee meetings were convened to critically evaluate the current courses, determine if changes were needed in content or format, and recommend future directions for the immunology curriculum. The committee met three times in 2015-2016 and 23 faculty members from six different departments on both campuses participated in at least one of the committee meetings. This diverse faculty involvement reflects the interdisciplinary nature of immunology and relevance of these courses for preparation of our students for research in a wide variety of topics.

The main focus of the committee's discussion was to determine if the courses covered the breadth of topics relevant to understanding of contemporary immunology in terms of theory and technique. At that time courses included Practical Immunology and Microbial Science, Immunobiology, Virology, and Papers in Immunology. A revised immunology curriculum of three key courses was approved as detailed below. The "introduction" course was designed to lay a foundation for the Advanced Immunology and Virology courses. It was also designed to attract students with diverse scientific interests

Table 6: Course Groupings for Evaluation Purposes

Curriculum Sub-Committee	Courses	Date of Review
Fundamental Biology	Applied Bioinformatics & Computational Biology	Winter 2015
Fundamental Biology	Cancer Biology	Winter 2015
Fundamental Biology	Cell Biology	Winter 2015
Fundamental Biology	Genetics and Genomics	Winter 2015
Fundamental Biology	Molecular Biology	Winter 2015
Fundamental Biology	Protein Folding in the Cell	Winter 2015
Immunology	Current Topics in Immunology	Summer 2015
Immunology	Papers in Immunology and Microbial Science	Summer 2015
Immunology	Immunology	Summer 2015
Immunology	Practical Immunobiology and Microbial Sciences	Summer 2015
Immunology	Virology	Summer 2015
Drug Discovery/Molecular Medicine	Bacteria and Antibiotics	Summer 2015
Drug Discovery/Molecular Medicine	The Business of Biotechnology	Summer 2015
Drug Discovery/Molecular Medicine	Cancer Biology	Summer 2015
Drug Discovery/Molecular Medicine	Clinical Investigation	Summer 2015
Drug Discovery/Molecular Medicine	Medicinal Chemistry	Summer 2015
Drug Discovery/Molecular Medicine	Molecular Medicine	Summer 2015
Neuroscience	Neurobiology	Summer 2016
Neuroscience	Concepts of Memory and Learning	Summer 2016
Neuroscience	Neurobiology of Disease	Summer 2016
Neuroscience	Neurobiology of Alcohol and Drug Addiction	Summer 2016
Neuroscience	Sensory Perception	Summer 2016
Chemical Biology	Chemical Biology I	Summer 2016
Chemical Biology	Chemical Biology II	Summer 2016
Chemical Biology	Medicinal Chemistry	Summer 2016
Chemical Biology	Bioorganic Chemistry	Summer 2016
Chemistry	Asymmetric Synthesis	Summer 2017
Chemistry	Bacteria and Antibiotics	Summer 2017
Chemistry	Basics of Chemistry	Summer 2017
Chemistry	Bioorganic Chemistry	Summer 2017
Chemistry	Classics in Total Synthesis	Summer 2017
Chemistry	Heterocyclic Chemistry	Summer 2017
Chemistry	Medicinal Chemistry	Summer 2017
Chemistry	Modern Organic Synthesis	Summer 2017
Chemistry	Natural Product Biosynthesis & Engineering	Summer 2017
Chemistry	Organometallic Chemistry	Summer 2017
Chemistry	Physical Organic Chemistry	Summer 2017
Chemistry	Spectroscopy	Summer 2017
Professional Skills Development	Effective Career Planning for Ph.Ds.	Summer 2017
Professional Skills Development	Effective Scientific Communication	Summer 2017
Professional Skills Development	Ethics in Science	Summer 2017
Professional Skills Development	Fellowship Boot Camp	Summer 2017
Professional Skills Development	Introduction to Biostatistics	Summer 2017
Structural Biology	Applied Bioinformatics and Computational Biology	Summer 2017
Structural Biology	Biophysics	Summer 2017
Structural Biology	Structural Biology	Summer 2017
Structural Biology	X-Ray Crystallography	Summer 2017

including chemistry, chemical biology, structural biology, and vaccine development. Since many beginning students may be unsure of their long-term scientific goals upon entering the program, the objective of this course is to introduce students to a breadth of both basic immunology and human immune diseases that may facilitate development of each student's own scientific path. With the advances in immunity-based therapeutics, it was felt that all students need a working knowledge of immunology to prepare them for any future role in the biomedical sciences.

The Immunobiology and Papers in Immunology courses were combined to form the new Advanced Immunology course. The course format is now two one-hour didactic lectures each week and a one-hour paper discussion session based on a recent publication on a topic discussed in one of the week's lectures. The Friday discussions are led by Professors Matthew Pipkin and Mark Sundrud from the Florida campus. This new format has been very popular with students and the revised course has received excellent reviews. The Virology course has been consistently well reviewed and there are no plans to significantly change the course format.

These courses are designed to cover topics not included in courses offered in other disciplines. The syllabus will be revisited annually to confirm that there is not significant overlap with content covered in non-immunology courses. The courses are designed to be taken alone or in order of the offerings from fall to winter to spring.

Feedback is provided by formal student critiques as well as feedback from course TAs and participating faculty lecturers. The course directors and faculty lecturers meet annually to read the critiques, review the course syllabi, and revise the curriculum to include new areas of interest, replace poorly reviewed lecturers or topics, and discuss possible course improvements. The following changes were implemented for the 2018-2019 Immunology courses.

6.1.3.1 Course Improvements

Course improvements include five new lectures with new faculty lecturers (biophysical measurements in immunology, animal models in immunology and infectious disease, stem cells and iPS cells in immunology, systems biology in immunology and statistics and reproducibility in immunology). In addition, changes were made in grading to reduce emphasis on class participation to 20% of grade from 50% due to concerns from Florida students on ease of participation in discussions using current intercampus technology.

Six new or revised topics and lecturers are planned for the spring 2019 course based on retirement of several former lecturers, new faculty recruitment and advances in areas of virology including arenavirues, and Lassa fever virus, coronaviruses, Hepatitis B virus, retroviruses, antiviral drugs, and harnessing NK cells to treat viral infections.

We have seen a steady increase in enrollment in all the current Immunology courses:

- Introduction to Immunology and Microbial Science (every fall): 14 (2014) to 21 (2017)
- Advanced Immunology (every winter): 12 (2013) to 22 (2018)
- Virology (every other spring): 12 (2013) to 19 (2017)

All three courses receive very favorable reviews and we anticipate that the numbers of students participating in these courses will continue to increase.

To supplement the immunology courses offered for credit, we strongly encourage students to attend the bi-weekly Immunology Journal Club held every other Monday at 4pm. Students, postdoctoral fellows or faculty members present a recent paper relevant to immunology. Students are also invited to have lunch with visiting Immunology seminar speakers. The bi-weekly departmental research in progress meetings allow two trainees to present their research, gain experience in oral presentations, and receive critical feedback from attendees. Finally, the Graduate Office has provided financial support for interested students with thesis committee approval to attend the Advanced Immunology course offered annually by the American Association of Immunologists.

6.1.4 Structural Biology Curriculum

The Structural Biology Curriculum includes courses in Structural Biology, Biophysics, and X-ray Crystallography. We have recently added a one-week Structural Biology "boot camp" for a quick introduction to the principles of structural biology and the molecular graphics and computational tools commonly utilized by structural biologists. This boot camp is very popular and our attendance has increased steadily over the last three years that we have offered it. This year we had over twenty students sign up, with most of them in their first or second year of the Graduate Program. The goal of the entire curriculum is to provide students with an understanding of the basic principles of structural biology and biophysics as well as the tools and technology that are commonly used. Each technique is typically taught in a short module (1-2 didactic lectures and journal club).

Throughout each course the strengths and weaknesses of each technique are delineated and there is emphasis on how different data can be combined to develop integrative models. This approach is state-of-the-art and enables students to approach biological problems in a robust manner without being confined to a single technique.

Additionally, we have incorporated lectures and practicums to train students how to use molecular graphics programs, computational modeling tools, and data repositories. Hence, we are very focused on preparing the next generation of structural biologists to tackle difficult problems. Each course is also designed to engage and educate the non-expert so that they can learn the fundamental principles, communicate effectively with experts, and learn how to incorporate structural biology and biophysics approaches into their own research in disparate fields such as neuroscience or chemistry. Scripps Research has been a pioneer in interdisciplinary training, and this philosophy, which is increasingly critical for solving difficult problems, is espoused within Scripps Research's curriculum. Finally, a major strength of our curriculum is the world-class faculty that teach individual units. Hence, the students are taught by leaders in their field of study. The structural biology and biophysics legacy at Scripps Research are highly respected and therefore offers students direct access to these faculty.

6.1.4.1 Evaluation

Students are evaluated by several different methods. Through empirical experimentation, input from students, and faculty, and academic investigation into methods that have been shown to be effective for teaching and evaluating we have developed a series of opportunities to evaluate student understanding and progress. Examples include written and figure-making homework assignments, journal clubs, in-class presentations, take-home midterm/final exams, and take-home problem sets. Journal clubs are particularly important because they challenge the students to apply lessons from the lectures to critically evaluate published research. Further, students get the opportunity to present in front of their peers and develop arguments supporting or refuting data and conclusions from the literature. Additionally, each ninety-minute lecture has fifteen minutes allocated for questions and discussion, where we encourage and foster inquiry and dialogue. We have found that the combination of these approaches is the most robust way to evaluate student progress. The diverse opportunities engage the wide range of students and personalities that matriculate in these courses. By enabling students with core knowledge, teaching them how to find information beyond the course, and providing many opportunities to actively discuss problems within class and journal clubs, we build confidence in the students during the semester. We encourage open inquiry, critical thinking, and speaking up during the course. Given that there are typically 2-3 course directors and a teaching assistant (TA) that attend nearly all the lectures we actively stimulate discussion, engage students, and evaluate the lecturers. The small class sizes (typically 8-15 students) is conducive to vibrant discussions and even the quieter and less confident students can be drawn into a discussion. While every class is different and comprised of different personalities it is clear when we have achieved success by the end of the course by how vibrant the journal clubs and in class discussions evolve.

6.1.4.2 Feedback

Students are required to provide a course evaluation, which we take very seriously and use the information to improve the course each year. Some students provide extensive feedback with great granularity, while others provide higher-level feedback. We also conduct interviews with the course TAs who provide invaluable feedback. We also make efforts to engage students 1-2 years after they have completed the course; this feedback is the most valuable because the students have a greater perspective, understanding, and appreciation for what they learned after they have completed their coursework and are conducting full-time research in the laboratory. We often receive feedback regarding how useful the practical skills for using molecular graphics software and accessing databases are for conducting research in the laboratory and presenting at meetings. Given the complexity and scale of data we train students to clearly represent structural and biophysical data in a clear and straightforward manner.

Another interesting point of feedback is laboratory choices of students that take the courses. Often, the most dynamic and engaging lecturers are the most desirable for student rotations and thesis work. Thus, there is great incentive to perform well in class and give inspiring lectures for the faculty. Once in the laboratory students begin much more intensive training and education, applying their core knowledge to a real-world problem.

A final metric for feedback is evaluating the abilities of students relative to incoming postdoctoral trainees from other institutes. These trainees, specifically those who do not come from a structural biology laboratory, often have a more limited skillset than our first- and second-year

graduate students that have taken our courses. We often use the tutorials developed in our curriculum to introduce topics such as molecular graphics and computational modeling to bring these postdoctoral fellows up to speed.

6.1.4.3 Distance Learning

We have increased the number of lectures from the Florida campus and other institutions where we do not have representative faculty to adequately lecture on a topic. Recent guest lectures, virtual or in person, have included faculty from UCSF, University of Washington, and UCLA.

6.1.4.4 Course Improvements

While the fundamental principles of structural biology and biophysics have not changed the number of techniques, throughput of data acquisition, complexity of data, and scale of problems approached are in constant flux. These are areas of continual growth and change for the courses. We have renewed focus on databases and informatics as well as computational tools. We also make a concerted effort to encourage participation of young or new faculty in the courses, thereby infusing new ideas and encouraging a blend of perspectives. We provide direction for each new lecturer and encourage them to engage the students as much as possible and use the active whiteboard technology in every classroom to create a more dynamic and authentic lecture versus a sedentary slide deck common to academic seminars.

Based on the various feedback mechanisms the courses are continuously evaluated and improved on a yearly basis by course directors. As mentioned above, we have incorporated more practical skills and opportunities for students to actively discuss scientific papers.

6.1.5 Neuroscience Curriculum

The pedagogical goals of the Neuroscience Curriculum are to provide students with a strong background in: (1) the theoretical underpinnings of of neuroscience research; (2) contemporary techniques for experimentally addressing neuroscience questions; (3) the appropriate methods for data analysis and interpretation in neuroscience; (4) the translational limitations and impact of neuroscience research; (5) critical analysis of the current literature; (6) the communication of science; and (7) the writing, reviewing, and rebuttal process in scientific communications. Particular attention was paid to pedagogical methods that are implemented in each of our courses, the balance of those methods between courses, and the extent to which those experiences foster critical thinking, enhance verbal and written communication skills, and provide broad exposure to research methodologies and data analysis.

6.1.5.1 Current Course Offerings

The neuroscience track integrates approximately forty-five faculty members from both campuses (twenty-two from Florida and twenty-four from California). The use of Zoom Video Web Conferencing tools for journal clubs maximizes bicoastal integration and minimizes the unfair evaluation of students. Over 90 students have enrolled in the neuroscience courses in the last six years. Approximately 25% of the students are chemists, and 75% are biologists. The neuroscience courses cover two major areas of neuroscience: (1) cellular and molecular aspects of neuroscience that are essential to understand contemporary issues in terms of both theory and technique; and (2) the role of integrative functions in normal physiological and pathological states that are essential to understand brain and mental disorders and provide a strong translational background. These areas are covered by one introductory course, two intermediate courses, and two advanced courses that are described below.

The introductory course [Fundamentals of Neuroscience (NEURO410)] covers cellular and molecular mechanisms in neuroscience and is meant to facilitate introduction to neuroscience for students from other fields of research (chemistry, immunology, genetics) and strengthen the depth of understanding of cellular and molecular mechanisms for students with a neuroscience background.

The two intermediate courses cover integrative functions in neuroscience in both healthy and pathological states. Concepts of Learning and Memory (NEURO560) covers classic and modern concepts of learning and memory across all levels at which learning and memory are studied, including behavioral, anatomical, cellular, molecular, and genetic levels of analysis. Neurobiology of Disease (NEURO530), which will be offered for the first-time in winter 2019, will cover some of the important and tractable disorders of the central and peripheral nervous systems. It will expose students to the incidence, clinical symptomology, and pathophysiology of various disorders.

The two advanced courses cover an in-depth analysis of specific integrative functions and brain and mental disorders. Current Topics in Sensory Neuroscience (NEURO590) provides multifaceted training in sensory system neuroscience. It focuses on visiting speakers in the Dorris Neuroscience Center lecture series. Students read and discuss background material that pertain to

the speaker's topic, attend the seminar, and prepare a *News&Views* commentary on the topic. Neurobiology of Alcohol and Drug Addiction (NEURO550) covers the neural circuits and neuro-signaling mechanisms that contribute to addiction. Lectures cover various levels of interpretation, including neurodevelopment, neurogenesis, synaptic plasticity, neurocircuitry, neuroimaging, and behavioral analysis in both laboratory animals and humans.

6.1.5.2 Course Improvements

The Neuroscience committee, composed of all course directors from California and Florida, met several times to discuss the current progress of the Neuroscience track and address potential shortcomings and ways to address them. **Figure 17** represents a new schedule of neuroscience courses that was proposed. The new schedule represents input from Neuroscience faculty in Florida and California that was also gathered and discussed during the Internal Program Review meetings in Florida and attended by California faculty members using videoconferencing. Discussions were guided by the data analysis of the students who were enrolled in the Neuroscience track in the last fifteen years that identified the contribution of chemists and biologists to the enrollee pool. We also analyzed responses from anonymous surveys that were administered after each course that identified a need to increase the depth of topics that are addressed in some courses and provide additional classes for the Fundamentals of Neuroscience and the Neurobiology of Disease courses. Analysis of the survey highlighted the very high ratings (typically > 3.5/4) for most course evaluation criteria, with the exception of a low level of ratings (2.5/4-3.5/4) for "critical thinking," "presentation," and "writing skills." Course directors also received input from students and TAs from informal discussions between teaching assistants and students that confirmed the initial analysis. The Chair of the Neuroscience curriculum also contacted several former TAs and students to receive additional feedback. We found this to be a very effective way to receive continual feedback from students as the course progresses and upon completion of the class.

Figure 18 shows the number of courses offered from year to year. The variability in the odd years versus the even years is due to some of the courses being offered every other year. The color boxes also highlight the discipline diversity of the courses. To view the course metrics in more depth, click on the title of **Figure 18**.

6.1.6 Curriculum Taught by Florida Faculty

While the entire curriculum was being reviewed, the Florida Self-Study Committee was looking to respond to the feedback from the Florida students and the 2013 External Program Review by increasing the number of courses directed by Florida faculty. In collaboration with the Deans Committee, a goal of twelve courses to be directed and primarily taught by Florida faculty by the

Figure 17: Program Requirements and Standards of Performance

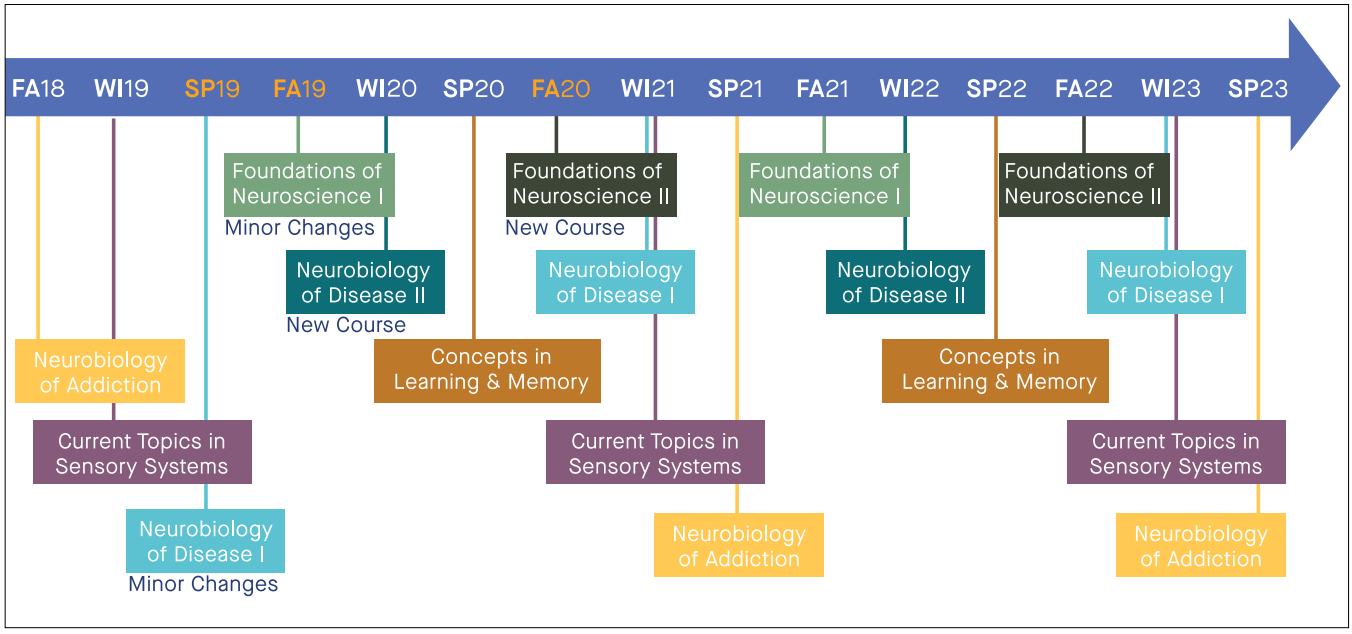
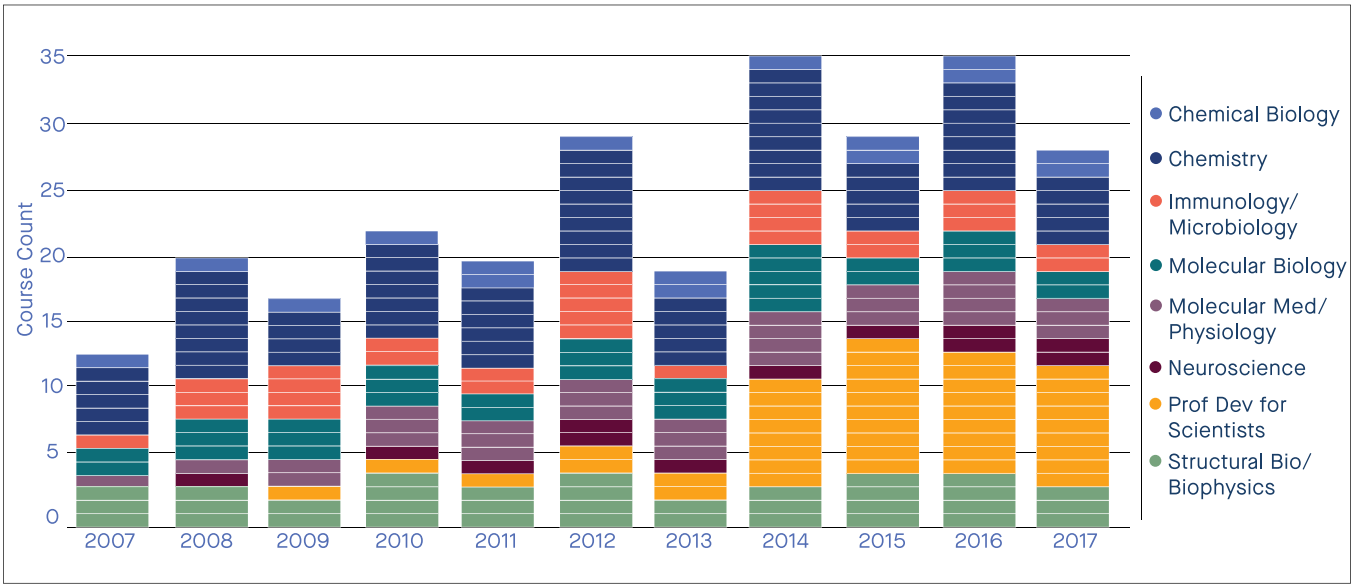


Figure 18: Course Offerings from 2007-2017



end of the 2016-2017 academic year was set (CFR 2.7). A complete listing of courses offered by Scripps Research is provided on the website.

To increase the number of courses offered by Florida faculty, a Florida Curriculum Committee was established and tasked with the objective to improve the classroom experience of the Florida graduate students and ensure that they feel integral to the bicoastal Graduate Program. At the time, the committee was initiated, courses led or co-led by Florida faculty were largely confined to the chemistry and chemical biology tracks (**Figure 19**).

Thus, the specific aims of this committee were: (1) to increase the involvement of Florida faculty, particularly biology faculty, in bicoastal teaching; (2) to highlight and use the unique strengths of the Florida campus in translational research, such as small and large molecule drug discovery and development; and (3) to improve the range and quality of courses offered on both campuses. All three specific aims were achieved. The number of courses led or co-led by Florida faculty started out with one in 2008-2009, rose to four in 2013-2014, and ten in 2016-2017. These ten courses (out of a total of 39 bicoastal course offerings; ~26%) are proportional to the fraction of faculty (~28%) and graduate students (~21%) located on the Florida campus. Notably, whereas all courses offered in 2013-2014 were led or co-led by Florida chemistry faculty, approximately half of the courses offered in 2017-2018 are led or co-led by Florida biology faculty. In addition to Florida faculty leading or co-leading courses, other Florida faculty are lecturing in many courses led by faculty on either campus. As shown by the light purple color in **Figure 19 and Table 7,** recent additions to the course offerings include a Drug Discovery and Development course and a Drugs of Today course taught by pharma/biotech industry-experienced Florida faculty focused on translational research. Collectively, Florida faculty from all five departments and all major disciplines and sub-disciplines are now involved in bicoastal teaching. While having more course directors, co-directors, lecturers, and TAs onsite has improved the classroom experience of Florida graduate students, courses led or co-led by Florida faculty have California graduate students enrolled. This indicates that the newly-developed courses are well aligned and integrated in the overall curriculum.

Bicoastal teaching places substantial demands on using broadcasting technology and pedagogy. However, navigating actual and virtual classrooms side-by-side is a timely challenge that contributes to the graduate students' experience and expertise in contemporary communication. The Graduate Program is currently piloting new video conferencing platforms, such as Zoom, to further enhance the participation in bicoastal lectures and journal clubs which is described in **section 5.1.5 of this Component.**

6.2 Evaluation of Professional Skills Development Curriculum

Professional skills developed in the foundation and co-curricular courses include research-related skills (e.g.,

Table 7: Course Offerings Developed in 2014-2017

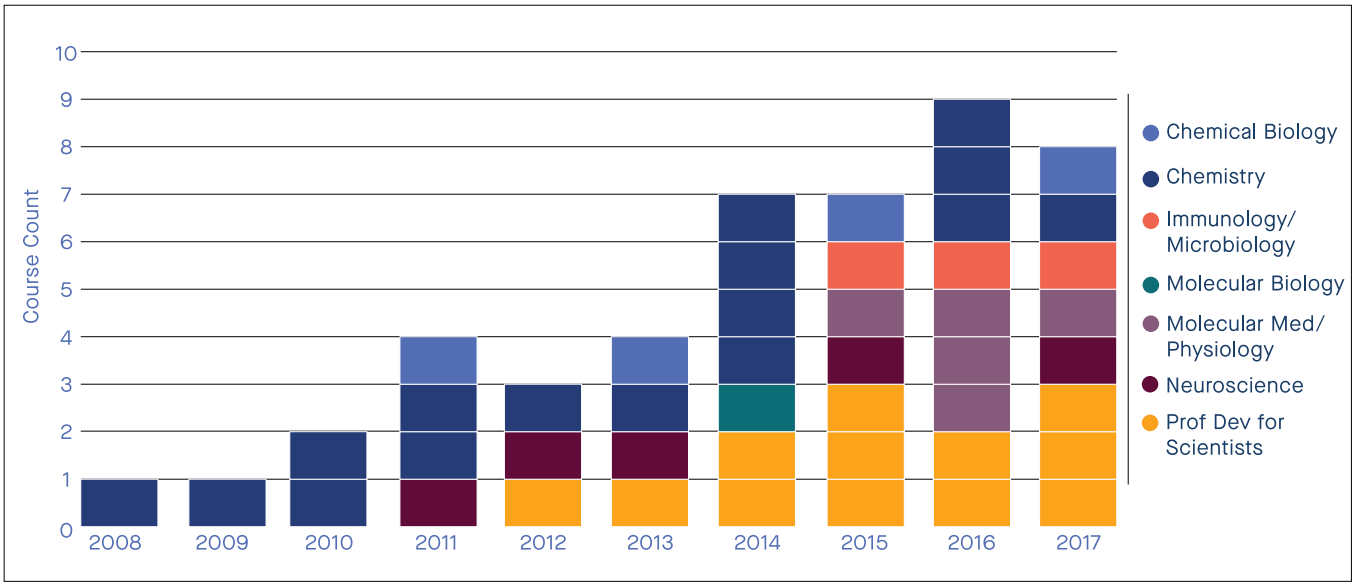
New Course Offerings Resulting from Curriculum Committee	Course Director / Instructor	Years Offered
Cancer Biology	Joe Kissil / Christoph Rader	2015, 2017
Chemical Biology II	Thomas Kodadek	2017
Drug Discovery and Development	Patricia McDonald	2017
Drugs of Today	Laura Bohn	2017
Natural Product Biosynthesis and Engineering	Ben Shen	2015, 2017
Neurobiology of Disease	Ron Davis / Baoji Xu	Not Yet Offered
Signal Transduction	Anutosh Chakraborty / Paul Robbins	2016

laboratory techniques, knowledge, data analysis, and scientific ethics), leadership, mentoring, networking, teamwork, writing, career development, critical thinking, oral communication, perseverance, goal setting, resilience, and more. These skills are developed in many of the professional development courses, as well as in the foundation courses, and many map to PLO's. For example, the Effective Scientific Communication, Fellowship Boot Camp, Introduction of Biostatistics, Effective Career Planning for PhDs, and Ethics in Science courses directly address oral presentation through in-class student presentations and exercises. All the professional development courses aim to develop scientists' critical thinking skills, and most allow students to apply the knowledge they have gained. It should also be noted that offering these courses also respond to national trends of incorporating professional development opportunities into graduate education. Four of the five aforementioned courses in this track are described in detail below.

6.2.1 Effective Scientific Communication Course

In the Effective Scientific Communication course, students learn effective strategies for presenting quantitative information in press and on the platform. Students read and analyze the data presentation in one assigned original research paper authored by the week's seminar speaker, attend the weekly seminar, and discuss the lecturer's display and presentation of the data. Students structure, construct, and present a standard 20-min platform talk based on the course's principles of effective scientific communication. The course covers

Figure 19: Course Offerings with Florida Course Directors from 2007-2017



scientific topics ranging from chemical synthesis to organismal biology.

The course pedagogy is Socratic due to the nature of the content. While interpretation of scientific results is often objective, style, and choice of data visualization method can be subjective. Generally, the class can agree whether a presentation was effective or not; they have more difficulty proposing uniform revisions that would improve the presentation. We address this issue by using the Socratic method; only through vigorous discussion and debate does the class classroom reach consensus. Still, there are didactic components, particularly in the early parts of the term. There are limited lectures on the concepts of "data ink" and "chartjunk" that teach the students to identify these components of quantitative graphics and use the concepts in the design of effective quantitative visuals. Students are often surprised to learn that given the open-ended task of revising a figure to improve data visualization, they often can arrive at common solutions to the major problems.

6.2.1.1 Evaluation

Outside of class quizzes, the major metric and assessment tool is the critique. Students give two presentations during the term: (1) one covering the week's paper in preparation for attending seminar, and (2) one covering their own research topics. After each, the student receives an oral presentation rubric form (aligning with general program learning outcome measurements) and an approximately five-page custom critique that the course director drafts. The critique pulls slides from their presentation and pairs with text describing aspects worth discussing as a class. Critiques mirror quantitative scores assigned in the rubric and the critiques are published. Everyone in the class can read and comment on the critiques. Thus, consensus opinion is a major component of evaluation.

6.2.1.2 Feedback

Feedback from the course is quite positive. The biggest criticism is that the course does not offer guidance on composition, which is outside the scope of the course.

The most obvious indications of success can be seen in the annual Graduate Student Symposium. Awards are given to the top two oral presentations, which are typically delivered by the most senior students. Last year, both top winners were students in the very first Effective Scientific Communication course.

6.2.2 Fellowship Boot Camp Course

This course prepares students to submit a proposal for the NSF Graduate Research Fellowship Program (GRFP) by providing guidance on basic composition, writing project management software tutorials, and proposal feedback in the form of a formal NSF-style panel review. It helps the student develop a graduate-level research project.

Writing a proposal for funding is a complex, non-linear task, involving many variables including the student's academic background and preparation as well as the specific research project, mentor, and laboratory. Thus, while generally applicable instructions and best practices are conveyed in a lecture format at the beginning of the class, this only represents a starting point for developing and writing proposals. Most of the class is instead focused on student skill development and writing of the proposal, participation in proposal review, followed by revision of proposals based on feedback from review.

During Panel Review, faculty members moderate student primary and secondary discussants. Students experience (many for the first time) blind peer review in the form of merit/impact statements from anonymized student and faculty reviews, though student and faculty reviews are indicated as such. Students respond to feedback and submit their GRFP applications to the NSF for funding consideration.

The course aligns with other professional or transferable skills courses, Effective Scientific Communication and Effective Career Planning, by providing a directed training on composition and persuasive technical writing. The course also aligns with virtually every other "hard skills" didactic course by way of training students to write a proposal, next experiment or any other writing assignment which leverages the skills taught in Fellowship Boot Camp.

The course is interactive and largely discussion-based. The two formal class periods are conducted in a grant review panel format. Students read their assigned proposals, deliver a summary and critique of the strengths and weaknesses, and rank the proposal. Course directors also engage individual students out of class for coaching as needed. Since the proposal topic and level of skill varies significantly between students, course directors engage students on as-needed bases. The course is very personalized in this regard

6.2.2.1 Evaluation

Assessment is summative, evaluating the quality of the proposal pre- and post-peer review, response to

feedback, and overall final proposal response to the NSF intellectual merit and broader impacts review criteria. These assessments are based on the research proposal portion only, not the personal statement. The course has evolved this year in response to feedback that the course felt rushed in the past. Previously, the course began in mid-September and then students had one month to compose the two documents, read and review proposals from peers, receive feedback from panel review, and submit their application. In response, course directors changed the course to begin in mid-summer for rising second-year students. This year we used the extra time to conduct two panel reviews. The second panel was a resubmission panel where the students were able to demonstrate response to feedback and issue rebuttals where needed. The course is ongoing as of this writing, but student response to the new format has been positive.

6.2.3 Effective Career Planning for Ph.Ds. Course

The Effective Career Planning for Ph.Ds. course, directed by CPSO staff members, is intended to encourage proactive career planning by equipping students with the skills, resources, confidence, and self-assessment information necessary to make informed career choices both inside and beyond academia. Designed for 10-15 students and postdoctoral fellows, the course includes self-assessment exercises, a career panel, career-based research assignments and student presentations, suggestions for action and experimentation, and more. In the final class session of Effective Career Planning for Ph.Ds., students summarize what they've discovered throughout the course, outlining their progress and career plans via an Individual Development Plan (IDP) poster. The IDP poster serves as both a reflection of key takeaways from the course, as well as a "roadmap" to their next professional steps. The IDP poster session synthesizes each student's learning, and they receive in-person feedback from both peers and course instructors about their next steps and ideas for action. One student summarized, "I was a little bit disoriented about what were my career options apart from academia. This course helped me learn about different career paths. It also helped me realize what are my skills and strengths, and how those can be applied to develop a successful, healthy and happy career." One postdoc credited the course with clarifying her desire to pursue a career in veterinary medicine. She leveraged her scientific background to gain admission into a top veterinary program and is now happily pursuing her dream career.

6.2.3.1 Evaluation

Online evaluations are solicited from all students for the course. In addition to the standard questions appearing on the evaluation forms, the course director(s) can add custom questions. Course directors can also collect feedback from students in other ways. For instance, in this course, students complete short anonymous pre- and post-course questionnaires based around the course learning outcomes. For example, agreement with the statement "I can articulate and substantiate three career-related SMART goals" was assessed before and after the course. On average, the reported level of agreement increased on each survey item at the end of the course.

6.2.4 Introduction to Biostatistics Course

The Introduction to Biostatistics course focuses on developing the basic principles and concepts of biostatistical analysis. The course director covers the fundamentals of probability theory, distribution theory, parameter estimation techniques, hypothesis testing techniques and model building (including analysis of variance and various regression models). The lectures center on the application of various statistical procedures based on the concepts and theories behind them. In recent years, student interest in bioinformatics has grown, driving the creation of complementary classes such as "Computational Biology and Bioinformatics." Comments on evaluations also led to discussions of how to bring more examples into the course.

6.3 Evaluation of Skills Assessment Tools

In addition to reviewing the professional development courses, the Professional Skills Development Committee also evaluated tools such as an Individual Development Plan (IDP) that could align continuous feedback with professional skills development. The committee's mission was to apply the same thoughtful discussion applied in the foundation curriculum committees to the Institute's career and professional development-related courses and as part of a broad effort to improve overall program quality.

6.3.1 Awareness and Adoption of IDPs

The committee spent significant time discussing the merits of Individual Development Plans (IDPs) as effective instruments to deliver constructive feedback to students, and how to better integrate them into the Graduate Program (CFR 2.12).

To better educate faculty on the benefits of IDPs, CPSO launched a short IDP workshop in 2017 that aims to familiarize faculty with IDP resources, implementation ideas, and benefits. The workshop is co-presented by staff from the CPSO and Glen Nemerow, Ph.D., Faculty Mentor. Several dozen faculty members have participated in the workshop to date. The office plans to offer a similar one-hour IDP introduction workshop for trainees.

Additionally, the graduate student IDP is not a regular part of student committee meetings. The advisory forms mention IDPs through an optional prompt that connotes the student may be struggling: "An IDP is recommended: Yes/No." The consensus of the group was that IDPs help encourage conversations between mentors and mentees for students who are on track as well as for students who are struggling. Therefore, the committee recommended to the Graduate Program that the wording on the form be changed to something more neutral.

6.3.2 Streamlining the IDP

The previous IDP was based on an early FASEB model and was more than a dozen pages. Feedback from both students and faculty was that it was simply too long; the committee viewed this as a major hurdle for adoption, so a subcommittee formed to tackle the task of revamping the graduate student IDP. Operating from that imperative, the subcommittee reviewed several models and came up with a core two-page IDP with optional portions for students who desire additional planning suggestions and details. The new IDP is designed to be revisited annually and includes short- and long-term goal setting as well as supplemental sections based on stage in the graduate program, a skills assessment, and a list of other IDP resources. The new IDP can be viewed in **Appendix 6-2**.

6.4 Technology Enhancements

Based on student and faculty feedback over the last few years, an initiative was started to enhance the bicoastal conferencing technology. At the core of this critically important intercampus system is the bicoastal high-speed networking infrastructure. The network system has seen extensive upgrading in speed, reliability and flexibility during the last eighteen months. These upgrades include new user interfaces, Polycom video conferencing systems, addition of SMART Boards and other screens for better interaction and communication, and new projectors and screens. The conferencing systems were upgraded from high end standard definition systems to state-of-the-art high definition technology. In addition to the upgrades, three new video conferencing rooms were added to the Florida campus. The Institute invested approximately $350,000 in this project.

IT Services also purchased a new video capture system to record classes and make them available to students at a later time. In addition, IT obtained an enterprise license for Dropbox, a cloud storage, file sharing, and collaboration service, for both campuses has been fully deployed.

Plans for next year include upgrading our conferencing bridge and adding a new video capable room on the Florida campus, at a cost of roughly $100,000. (CFR 3.5, 4.6)

6.5 Institutional Research and Database Updates

Database platforms that capture, track, report, and reflect on the Graduate Program's indicators of student success continue to be enhanced, upgraded, and developed. To date, there are five. Three custom systems have been designed to collect data on admissions, students, faculty, courses, publications, alumni, and outreach and thus provide insight at the individual student level as well as in aggregate and longitudinally. All the systems talk to each other and allow for up-to-date information to be available to the business intelligence tool, Tableau. In addition, a new commercially available website, was developed to engage alumni in their professional and personal endeavors. It, too, will be connected to Scripps Research's custom systems and business intelligence tool as appropriate. Below is a brief update made to the five systems.

1) **Online Admissions System.** An Online Admissions System (OAS) was created to move the admissions process from paper to an online database in 2009. Since it was a first attempt to move such a complicated process online, it did not include all the critical application and review components. The first major overhaul to the system was initiated in 2014. The changes included: (1) the elimination of geographic preference question on the application. This no longer auto-assigned any application based on geographic preference; (2) add a new Faculty of Interest section based on faculty's last name; (3) a way to distinguish faculty of interest who also serve on the admissions committee; and (4) outline the expectations of the personal and research statements.
2) **Learning Management System.** Scripps Research is embarking on a review of Learning Management Systems (LMS) to enhance student learning, faculty/student interaction, and feedback

to students and allow for new methods for delivering course content using new pedagogical techniques that integrates with classroom learning and stretches the learning experience beyond the core classroom experience.

3) **Student Records Database.** When the Student Records Database (SRD) was developed, we focused on the student's lifecycle through the program. It contains fields for all the key components of the program, including coursework, rotations, thesis advisors, committee meetings, publications, and rubrics. Now that the system is working well, we want to build out the basic alumni section to include more information about the alumni's career path and publications. SRD will store multiple work locations, providing a chronological work history, and then categorize the work place based on the categories collaboratively determined by the Graduate Office and the CPSO. In addition, the faculty section of SRD will also be built to capture all the ways in which the faculty contribute their time and effort to the Graduate and Outreach Programs. This would include all the committee work, both student advisory committees as well as program committees (e.g., Admissions, Curriculum, Self-Study, etc.).
4) **Tableau.** As the Graduate Office is collecting more and more data on student learning and success, it is becoming more and more critical for the data to be available, complete, and in a format that could be used to inform decisions and budget plan. In an increasingly data-driven environment, the Graduate Office is spending a lot of time using spreadsheets to analyze data and create graphs and charts. A decision was made to purchase a business intelligence tool that would allow us to spend less time analyzing the data and more time using the data. After an exhaustive search, Tableau was selected and is connected to a live extract of the critical data from OAS, CRS, and SRD. Over the next two years, we will embark on a comprehensive data cleanup project.
5) **Online Alumni Community.** In late 2014, a new website project was initiated, charged with building an online platform to forge lasting connections between Scripps Research and the participants—former and current—of its education, training, and outreach programs. Similar in some respects to traditional university alumni groups, the new website was designed to focus on elements of distinct importance and value to Scripps Research's unique alumni population: professional development and career building resources; a place to foster scientific discussions and research collaborations; and a means of reconnecting with fellow laboratory members, past and present. A beta phase in late 2016 allowed Scripps Research to collect valuable feedback from a small test group of current and former graduate students, postdoctoral fellows, and undergraduate interns. Upon implementing changes and improvements, the full Scripps Research Alumni & Friends website was launched in mid-2017 and has been growing steadily. The major objectives at this early stage have been to bolster and update the database of contact information for Scripps Research alumni, and generate continuously updated, relevant content for members of the site. The website, which is managed jointly by Scripps Research's Office of Graduate Studies and Career and Postdoctoral Services Office, will serve as a valuable, up-to-date source of information about its trainees and students' career progression and professional accomplishments. (CFR 4.2)

6.6 Website Search Engine Optimization

Scripps Research's Graduate Program website is not currently configured in a way that allows it to be easily found by key audiences using search engines like Google and Bing. Web searches for graduate programs in Scripps Research areas of strength and expertise do not currently include Scripps Research in the results. Moreover, outdated information about Scripps Research's Graduate Program exists on various websites and may contribute to confusion about the program.

A well-planned and thoughtfully executed project that employs best practices in Search Engine Optimization, internet marketing, and social media outreach would make measurable improvement in both the information accuracy and awareness levels of Scripps Research's Graduate Program and key research areas on which a student could focus. Since the aforementioned problems can be divided into two critical initiatives, we proposed a two-fold solution that will be implemented over the next three years. The two initiatives are: (1) find and eliminate the remaining references to the discontinued Kellogg School name; and (2) improve Scripps Research's standing in search engine results by making changes to the content of our website as well as the back-end page code, creating new webpages and content, and

executing a link-building strategy. Great progress has been made on both initiatives. See **Appendix 6-3** for the Website Optimization and Social Media Working Group for detailed minutes.

In brief, we have eliminated many references to Kellogg School on the World Wide Web. For the second initiative, we will tackle the website SEO project by research areas. With the help of faculty and students, we have developed a keyword research plan that addresses our specific needs as well as goals for the neuroscience faculty, students, and the program.

6.6.1 Student Achievement Website

As a result of the pressure on accreditors to show evidence that college and university graduates possess the desired knowledge and skills that employees seek, WSCUC commissioned a working group to determine how institutions should communicate student achievement to the public. After receiving the working group's final report, the Graduate Office developed an approach to meet the expectations of WSCUC while remaining true to the mission and values of Scripps Research. This included creating a webpage to provide up-to-date information demonstrating the learning outcomes and scientific achievements of Scripps Research graduate students during, or as a result of, their graduate studies. Here are the five guiding principles identified by the Student Achievement Working Group: (1) define the meaning of student achievement in relation to the institutional context; (2) describe the attributes/criteria of student achievement; (3) represent student achievement holistically; (4) demonstrate institutional responsiveness to student achievement results; and (5) present information for multiple audiences in clear and compelling formats.

In the first iteration of the site, we focused on quantitative data that highlights our students' success through the admissions process, coursework, co-curricular activities, publications, faculty involvement, and retention and graduation rates, fellowships and post-graduation outcomes. In addition to the easy-to-understand, graphs and tables, we have also placed the activities and data into context. The next iteration will include qualitative summaries, student profiles, and interactive data tables. (CFR 1.2, 4.1)



7

SUSTAINABILITY: Financial Viability and Preparing for the Changing Higher Education Environment

7.1 Financial Viability

This component articulates Scripps Research's recent financial history and our approach for maintaining and growing a portfolio of resources to fulfill our mission, all while continually adapting to changes within the higher education terrain. The goal is to document the realignment of resources and to show evidence of closing the loop for decision-making processes, positive campus culture, assessment of PLO's, and Program Review. There is no plan to reinvent the wheel but to utilize existing processes and workflow to effect change. The Institute anticipates maintaining financial stability over the next ten years through careful alignment of resources, prudent management of expenses, and growth of its revenue-base through innovative curricular programs, philanthropy, and grants and contracts.

7.1.1 Sustainability

The financial crisis of 2008 led to a drastic reduction in grant funding from the federal government (**Figure 20**). The Institute responded by implementing limited budget cuts and reducing costs. Toward this end, faculty recruitment was limited, and departmental administrative support was consolidated.

Since the last WSCUC visit in 2010, Scripps Research has maintained its financial viability. Total assets went from $865,626 in 2011 to $787,833 in 2017. The two most recent audited financial statements are in **Appendix 7-1** for California and **Appendix 7-2** for Florida. Despite funding of externally sponsored programs becoming more competitive, the Institute continues to successfully secure grants and contracts. In 2018, the Institute attracted large public and private funding. This includes: a $15 million grant from the NIH's Institute of Allergy and Infectious Diseases which will support the efforts of the Scripps Research-led Center for Viral Systems Biology to fight Ebola and Lassa viruses; a $3.3 million grant from NIH's Brain Initiative which will support the creation of a complete neural circuit in a mammalian brain; $34 million Clinical and Translational Science Award from NIH's National Center for Advancing Translational Sciences (NCATS) to advance medical research and clinical care through genomic and digital technologies; $2 million grant from NIH's National Institute on Alcohol Abuse and Alcoholism to study how an understudied brain region promotes alcohol drinking; $2.5 million grant from NIH's National Institute of Diabetes and Digestive and Kidney Diseases; $12 million from the Bill and Melinda Gates Foundation to improve flu and malaria vaccines; and $50

million lead gift to establish fellowships for students in the Graduate Program.

The annual budget planning process is designed to support the Institute's mission and to direct available resources to the highest academic and administrative priorities. Facing a continuing array of financial challenges, the Institute is launching an exploration of alternative budget models to ensure the most effective use of our limited resources.

The Graduate Program is a fully-funded program; it provides support for all graduate students in their first year in the program. This support includes tuition, medical benefits, and stipend. Starting in the second year, it is the responsibility of the faculty advisor to support the student's costs from grants or start-up funds. If the student receives a fellowship from a federal agency or research foundation, the student may be eligible for a stipend supplement. All students are encouraged to apply for fellowships and programs are in place to assist and support our students with the application process (e.g., Fellowship Boot Camp and Effective Scientific Communication courses).

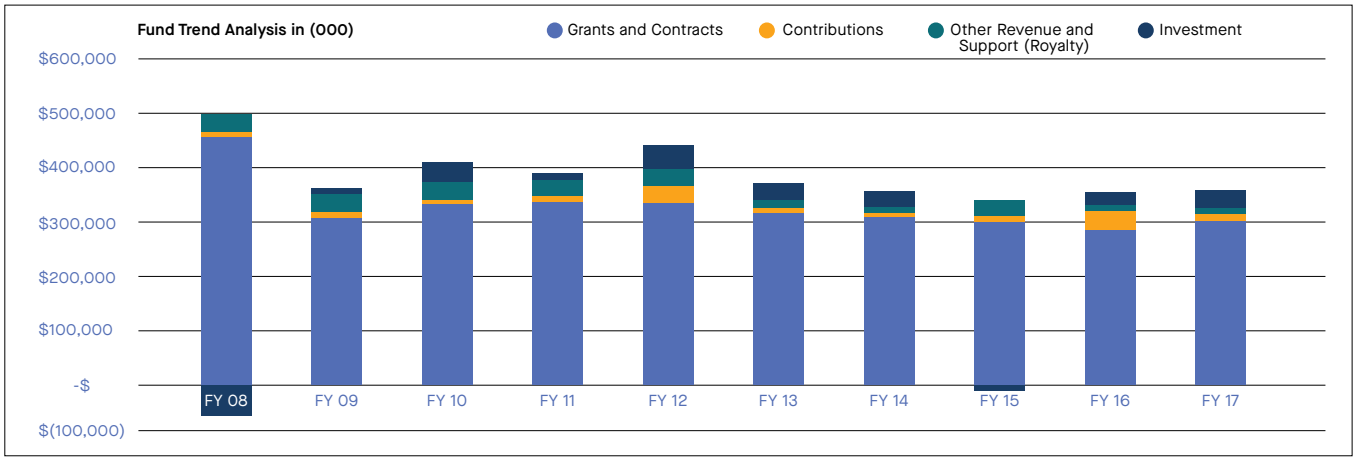
Tuition is set by the Executive Office and has not changed since the program began. The revenue from tuition does not cover the entire costs of the program and when it is necessary to reduce costs, the highest priority for spending has been ensuring the students receive their stipend and meeting course enrollment needs. Other expenses such as recruitment and social programs are seen as discretionary and are cut as needed. The rest of the program budget is covered by other sources (e.g., philanthropy, endowment). The cost of the program is approximately 2-4% of the total operating budget of the Institute. The budget of the bicoastal program is approximately $6M and a copy of the 2017-2018 budget is in **Appendix 7-3**.

7.1.2 Increasing Revenues

Scripps Research has engaged in a concerted effort to pursue additional revenue sources:

- On January 17, 2018, Scripps Research announced that the Skaggs family made a lead gift through their foundations toward Scripps Research's $100 million campaign to establish fellowships for students in the Graduate Program. The Skaggs family's gift will make it possible for individual supporters of the Graduate Program to donate $500,000 that will then be supplemented by an additional $500,000 from the ALSAM Foundation and the Skaggs Foundation for Research to create a $1 million endowment for an individual named student fellowship. When fully endowed, the Skaggs endowments will provide > $5 million per year in income to support graduate students. Importantly, the Skaggs fellowships will eliminate $1.5 – $2.0 million from the current institutional support of the graduate program budget (tuition/stipend/fringe of 33 first-year students).
- The Office of Technology Development (OTD) advances several major translational research and technology commercialization initiatives at Scripps Research. The OTD and Calibr are dedicated to identifying and advancing new therapeutic strategies, with major initiatives focused on a particular stage of development or dedicated to a particular area of unmet need. The Gates Global Health initiative represents a significant partnership with the Bill and Melinda Gates Foundation (BMGF) that supports an integrated drug discovery platform dedicated to addressing diseases with a major

Figure 20: Revenue Trends from 2008-2017



impact in developing countries. Strategic Alliances include focused collaborations with other foundations and organizations with innovative new technologies to further enable cutting-edge drug discovery. PRIMER supports taking advanced assets through IND-enabling studies and early clinical development. Collectively, these initiatives enable bench-to-bedside discovery and new medicines for diverse unmet medical needs.

7.2 Changing Higher Education Environment

In its 2017 Trends Report, The Chronicle of Higher Education outlined ten key shifts facing higher education. Four of the ten: assessment of admissions policies designed to advance diversity; safety net for hungry and even homeless students; rights of the accused in Title IX cases; and sexual harassment within the academic profession are of particular relevance to Scripps Research. Below we unpack how we are dealing with these issues.

7.2.1 Admissions Policies

Scripps Research is committed to promoting diversity at all levels and to providing equal opportunities for pursuit of scientific inquiry. The Institute recognizes that a broad representation of perspectives and experiences strengthens our pursuit of excellence in science and education. A primary goal for the Admissions Committee over the last several years has been to focus on the recruitment of underrepresented minorities (URM), improve the female-to-male ratio, and increase the number of foreign nationals who completed their undergraduate training from a school abroad. Impressively, our efforts have significantly improved the number of URM admitted into the Graduate Program from 4% in the 2013 class to 19% in the 2018 class, and 46% of the enrolled students in the 2018 class in comparison to 15% in the 2010 class.

We see similar improvements in our foreign national enrollment where 28% of our incoming students in 2010 were non-US citizens and now boast 37% foreign nationals in 2018. Given the return on investment, we will continue to improve the demographics of our student population so that it is representative of the cities and states in which the campuses are located.

Several recruitment and marketing initiatives have been evaluated through the Program Review process. The following three have been utilized successfully to recruit underserved and underrepresented students on a bicoastal basis:

1. The Graduate Office sends thank you letters to faculty who provided recommendation letters for admitted students from the previous admissions cycle. This was done to encourage the recommending faculty to continue to recommend the Scripps Research Graduate Program when other good candidates from their institutions are ready to apply to graduate school.
2. Graduate Office staff and graduate students attend conferences to raise awareness of the program. These recruiting efforts are undertaken by staff from both campuses, emphasizing the bicoastal nature of our single Graduate Program.
    a) Annual Biomedical Research Conference for Minority Students (ABRCMS);
    b) NIH Graduate and Professional School Graduate School Fair;
    c) Society for the Advancement of Chicanos and Native Americans in Science (SACNAS);
    d) National Organization of Black Chemists and Chemical Engineers (NOBCChE);
    e) American Association of Advancement in Science (AAAS);
    f) American Chemical Society (ACS);
    g) Society for Neuroscience (SFN); and
    h) Southeastern Regional Meeting of the American Chemical Society (SERMACS).
3. Faculty are encouraged to send follow-up emails to their summer undergraduate interns and encourage them to apply to Scripps Research's Graduate Program.

7.2.2 Hungry and Homeless Students

In collaboration with the Graduate Student Councils, the Graduate Office evaluates the training and research environment provided in Scripps Research's Graduate Program. Annually we evaluate the student by requesting information about stipend level annually. Using an anonymous survey, we ask student about their living expenses including housing, utilities, groceries, gas, car insurance and other monthly expenses. The most recent survey is in **Appendix 7-4**. The survey revealed that 33% of respondents (100 students) thought that the current stipend did not provide enough financial support for living expenses.

7.2.3 Title IX Policy

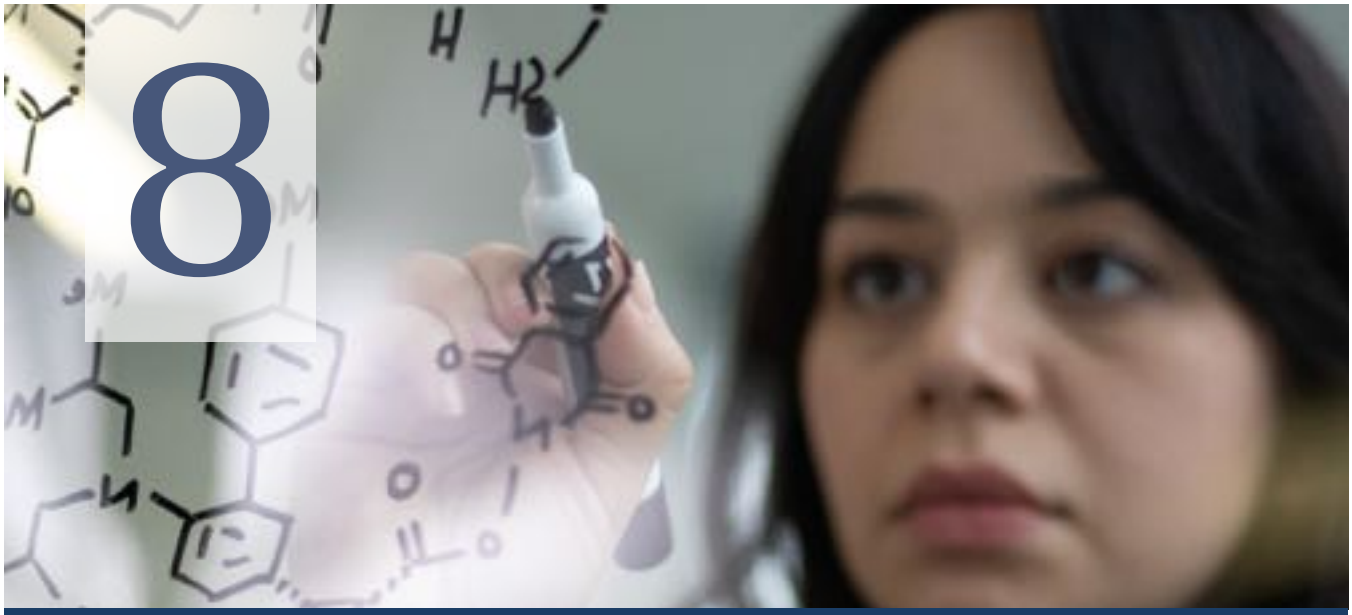
To ensure a safe, welcoming, and non-discriminatory educational and work environment for every member of the Scripps Research community, the Institute has established a Gender-Based and Sexual Misconduct Policy in compliance with Title IX law. This comprehensive policy (**Appendix 7-5**) prohibits all forms of gender-based or sexual misconduct, including but not limited to sexual harassment, sexual assault, unwanted persistent sexual contact, domestic violence, intimate partner violence, and stalking.

In accordance with Title IX regulations, Scripps Research has designated Karen Haggenmiller on the California campus and Christine Ng-A-Fook on the Florida campus as Title IX Coordinators. These individuals are charged with monitoring compliance with the regulations; overseeing the Institute's investigation and response to reports of misconduct or discrimination; and serving as a resource for individuals who experience gender-based or sexual misconduct or discrimination.

The Title IX webpages on the Institute's website provides detailed information about the policy and what to do if you, or someone with whom you work, experience sexual misconduct, harassment, or discrimination. Of particular interest to someone who has experienced unwelcome behavior is information about confidential resources and support, as well as formal mechanisms for reporting incidents. Details about Scripps Research's procedure for responding to reported incidents and enacting interim interventions to stop the unwanted behavior is also available online.

7.3 Conclusion

Scripps Research is in a good position to achieve its Strategic Plan and education and research accomplishments through sound financial stewardship and processes of inquiry. By investigating new opportunities for conserving and increasing resources, Scripps Research's future is bright. Through shared governance between the Executive Office and the faculty, solutions for dealing with research and educational needs will be realized.



8

Institution-Specific Theme(s) (Optional)

Scripps Research elected not to explore an option institution-specific theme for this report.



9

CONCLUSION: Reflection and Plans for Improvement

In this concluding component, the institution assesses the impact of the self-study, reflects on what it has learned during the self-study, and discusses what it plans to do next.

The Graduate Program has come a long way since the first students entered the program in 1989. It has fully embraced the accreditation process, using it to improve the program and inculcate the faculty. In addition, many of the Graduate Program activities are being integrated between the two campuses, including student recruiting, admissions, courses, oversight of the program, research rotations, student committee meetings, and use of rubrics in assessing student performance at committee meetings and thesis defense.

Moving forward, we have identified the following objectives for future growth and development of the Scripps Research Graduate Program across the two campuses.

9.1 Meeting Student Needs

We will continue to monitor the needs of our students (academic, emotional, mentoring, social, career development, etc.) and implement new programs to meet these needs. The deans have regular meetings with graduate students to discuss issues concerning the Graduate Program, student life, and career development. The graduate students also have town hall meetings to discuss issues. These meetings provide an excellent mechanism for the Graduate Program to receive input from our students about what we are doing well, what we need to do better, and what new initiatives we might undertake to further enhance the program. Concerning mentoring, career development and social activities, the student body already participates in many of the trainee development activities outlined in Component 5 as well as this Component of the report. The Deans and the Director of Graduate Studies have charged the Graduate Student Council to identify additional areas of student need. See **Appendix 9-1** for recent agendas and work products. (CFR 2.11, 4.7)

9.2 Increase Fellowship Funds

America's strongest universities and colleges have large endowments, enabling them to reach increasingly higher levels of academic excellence. Endowments can support fellowships, department chairs, faculty hires, and academic programs. Scripps Research will strive to increase the amount of fellowship funds available to support graduate students, which will ensure these

students have opportunities to perform research in the laboratories of assistant professors who have not yet obtained major funding for their research programs. The goal is to have 100 new fellowships by end of 2027. (CFR 3.4)

9.3 Experiential Learning Opportunities

Co-curricular training experiences are a key component of graduate education at Scripps Research. Through collaborations with engaged faculty, campus networks, and other local San Diego research institutions, CPSO supplements the training graduate students and postdoctoral fellows receive in the laboratory by promoting a culture of informed, proactive, and strategic career planning.

Many of the workshops offered through the CPSO stress early and effective planning, and the recognition and transferability of key skills acquired through their training at Scripps Research. These skills are covered in workshops such as Introduction to Networking, which emphasizes the importance of developing and delivering a cohesive elevator pitch, and Convey Your Science with Posters, which discusses tips designed to optimize poster presentations at conferences. Recent CPSO offerings include: Academic Job Search 101; Academic Laboratory Management and Leadership Symposia; Ace the Interview; American English Pronunciation; Careers Beyond Academia; Convey Your Science with Posters; Effective Career Planning for PhDs; Effective Scientific Writing; Getting from Job Ad to Interview; Introduction to Networking; Meet the Alumni Chats; Negotiating Your Job Offers; Scientific Proposal Writing; Social Media for Scientists; Transition to Industry; and Videotaped Practice Interviews. Others are planned, including a Strengths-based leadership program for student and postdoctoral leaders.

In 2017, CPSO piloted a new career exploration program, Exploring Careers with Experiential Learning (ExCEL), for trainees to visit employers and gain real-world experience working on representative projects. Goals of the program include: providing trainees with real world, representative cases/problems to solve; connecting companies to talented Scripps Research junior scientists; increasing trainee knowledge about a specific career path and company culture; increasing trainee confidence and optimism regarding their career plans; and changing trainee behavior toward their career exploration and job search. ExCEL experiences have included medical science liaison (Teva Pharmaceuticals), patent agent (Ionis Pharmaceuticals), management consultant (1798 Consultants), and product marketing/market research (Sciencia Consulting). The feedback has been positive from both students and faculty; the model works well as a low-cost, low-risk experiential opportunity that does not take substantial time away from the laboratory.

The Professional Skills Development Committee discussed opportunities for integrating experiential learning into the curriculum. Offering ways for students to explore career options through optional, hands-on experience is a trending topic in STEM graduate and postdoctoral training, with various grant-supported models emerging in recent years. Both student and faculty committee members supported the model. Current efforts are underway to assess feasibility for grant support of expanded "mini internship" programs.

Because of the vibrant local biotechnology community in San Diego, setting up ExCEL opportunities is easier for the California campus than it is for Florida. The committee discussed the possibility of Florida graduate students traveling to participate in similar activities or other ways to entice more industry employers to visit the Florida campus. These discussions are ongoing and possible funding streams are being explored.

9.4 Alumni Engagement

In its very short history, Scripps Research is amassing an unparalleled alumni network that extends throughout the world. Our graduates are leaders in an exceptionally broad range of organizations, particularly at universities and biotechnology and pharmaceutical companies. Scripps Research is interested in facilitating clubs and associations around the world that could provide a wide range of professional, educational, and social programs within their communities, reinforcing Scripps Research's mission to emphasize the creation of knowledge and educate the next generation of scientists. The alumni website will serve as a valuable, up-to-date source of information about its trainees and students' career progression and professional accomplishments. (CFR 2.6, 4.5, 4.7)

9.5 Bicoastal Integration

The Graduate Program is committed to continuing efforts to integrate all aspects of the program bicoastally. The activities of the Graduate Office on the Florida and California campuses are closely integrated. Monthly meetings have been scheduled to further facilitate communication and coordination of Graduate Program activities between the two campuses; however, more work needs to be done to be a more effective and efficient team. (CFR 1.5, 3.4-3.5)

9.6 Faculty Development

It is imperative that the Graduate and Outreach Programs adopt an active learning approach to curriculum delivery in the classroom as one of several steps in modernizing and enhancing the effectiveness of teaching at Scripps Research. We propose to design active learning approaches tailored to our educational goals and provide support and workshops to both research and teaching faculty to facilitate their implementation. (CFR 3.3) Effective transmittal of course material and lectures in a bicoastal manner is effective, but a continuing challenge to ensure consistency. We propose to design a workshop where faculty can experience lectures from "the other campus" and use this to refine the presentation of their courses.

9.7 Gender Variations

Associate Dean Wendy Havran is conducting an evaluation of program outcomes based on gender. There has been a perception that Scripps Research female students have less successful career outcomes. Data are being collected for all 1066 students associated with the program since inception for critical evaluation of student success rates. Three metrics of success will be evaluated: 1) performance (grades, rubrics, time to qualifying exam, publications); 2) retention (time to Ph.D. degree, terminal master's degree, non-completion without degree); and 3) post-graduate outcomes (academic research/teaching, industry research, scientific communication, education professional, additional degree program, non-scientific employment). In addition to analysis of outcomes solely based on gender, data will be further analyzed to determine if there are differential outcomes for international versus domestic students and chemistry versus biology students. Critical evaluation of these data will determine if male and female students have different rates of success and guide plans for intervention, should differences be found. (CFR 2.5, 2.10).

Supporting Documents

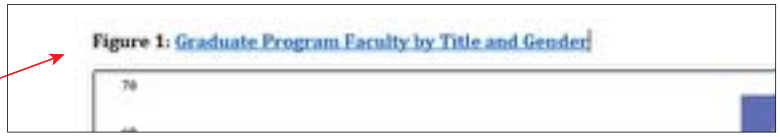
To increase the readability and access to supporting data and documents, the report includes three indexes that are hyperlinked to the relevant location in the report. The three indexes are:

1. Tables and Figures
2. Criteria for Review
3. Glossary of Terms

Navigating Tableau Online

Navigating to the Scripps Research Tableau Public chart repository allows the reader to explore data in more depth and select filter options such as demographic grouping (gender, URM, citizenship, research area); campus (CA, FL, All); academic year (2007-2017), etc. The following provides additional directions for navigating to the Scripps Research Tableau Public chart repository.

1. Left-click on a figure or table title that has a link to a Tableau chart



2. The chart will open in Tableau Public



Depending on the type of chart, there may be some filters (for instance, the student cohort charts have options to view different demographic groups).

List of Tables

Table 1: Scripps Faculty by Gender and URM 9
Table 2: Average Rotations from 2007-2017 26
Table 3: External Fellowships Secured by Graduate Students 31
Table 4: Retention Rates for all Students: Cohorts 1997-2017 36
Table 5: Retention, Graduation and Time-To-Degree for all Students: Cohorts 1997-2017 37
Table 6: Course Groupings for Evaluation Purposes 43
Table 7: Course Offerings Developed in 2014-2017 49

List of Figures

Figure 1: Graduate Program Faculty by Title and Gender 9
Figure 2: Total Enrolled Students from 2007-2017 11
Figure 3: Enrolled Students by Class from 2007-2017 12
Figure 4: Total Enrolled Students by Ethnicity 13
Figure 5: Writing Teams 15
Figure 6: Students' Degree-Related Papers per Cohort from 2007-2017 21
Figure 7: Current Positions of Alumni 23
Figure 8: Alumni Position by Graduation Year 2007-2017 24
Figure 9: Five-Step Process of Program Review 24
Figure 10: Five Program Requirements 26
Figure 11: Committee Meeting Timeline 27
Figure 12: Year of Meeting Type 28
Figure 13: Rubric Ratings by Meeting Type 29
Figure 14: Schematic Overview Showing Different Stages of the Graduate Admissions Process 33
Figure 15: Admissions Statistics: Applied, Admitted, and Enrolled Applicants from 2011-2016 35
Figure 16: Usage of CAPs Services by Title 40
Figure 17: Program Requirements and Standards of Performance 47
Figure 18: Course Offerings from 2007-2017 48
Figure 19: Course Offerings with Florida Course Directors from 2007-2017 49
Figure 20: Revenue Trends from 2008-2017 56

List of Criteria for Review

Standard 1: Institutional Purpose and Ensuring Educational Objectives

CFR 1.1 Statement of Purpose

Clear Mission 16

CFR 1.2 Educational Objectives Widely Recognized

Program Learning Outcomes Flow from Mission 16
Retention Equitable across Demographic Groups 35
Strong Time to Degree 35
Student Achievement Website 54

CFR 1.3 Commitment to Academic Freedom

Academic Freedom Philosophy 16

CFR 1.4 Commitment to Diversity

Faculty Diversity and External Benchmarks 9
Student Gender Diversity 11
Recruitment of Diverse Students 14
Recruitment of Diverse Faculty 16

CFR 1.5 Education is Primary Purpose

Commitment Since 1989 5
Alignment of Bicoastal Graduate Office 61

CFR 1.6 Truthfully Represents Academic Goals, Programs and Costs to Students and Public

Transparency of Evidence 16

CFR 1.7 Exhibits Integrity and Transparency in Operations

Transparency of Evidence 16

CFR 1.8 Honest and Open Communications with Accrediting Commission

2011 WASC Commission Action Letter 12
2011 WASC Commission Action Letter 14

Standard 2: Educational Objectives through Core Functions

CRF 2.1 Programs Appropriate in Content, Standards of Performance, Rigor, Degree Awarded, Delivery

Program Learning Outcomes Tied to Mission 10
Highly Qualified Faculty 17
Rigorous Final Thesis Work 27

CFR 2.2 Student Achievement for Degree Awarded Clearly Defined

Program Learning Outcomes Defined by Faculty 17
Meaning of Degree 20
Rigorous Final Thesis Work 27
Admissions Metrics – Admit and Yield 34

CFR 2.2a Undergraduate Programs – Not Applicable

CFR 2.2b Graduate Programs State Clear Objectives that are More Advanced than Undergrad

Rigorous Final Thesis Work 27

CFR 2.3 Student Learning Outcomes and Standards of Performance Clearly Stated
Program Learning Outcomes Tied to Mission 10

CFR 2.4 Student Learning Outcomes Developed by Faculty and Widely Shared
Committee Structure for Ensuring Learning Outcomes Achieved 10
Program Learning Outcomes Defined by Faculty 17
Teaching and Mentoring Philosophy 17

CFR 2.5 Academic Programs Meet High Standards of Performance and Involved Students in Learning
Evaluation of Faculty Gender Variations 62

CFR 2.6 Graduates Consistently Achieve Stated Learning Outcomes
Teaching and Mentoring Philosophy 17
Students' Career Progression and Professional Accomplishments 61

CFR 2.7 Ongoing Systematic Program Review
2013 External Program Review 10
Ongoing Program Review 13
Annual Bicoastal Program Review 13
Cycle of Program Review 13
Institutionalizing Quality Assurance 18
Integrity Monitored Thru Program Review 23
Indicators of Student Success 27
Full Review of all Courses 48

CFR 2.8 Define, Value and Promote Expectations for Research, Scholarship and Creative Activity
List of Scientific Discoveries 6
Expectations of Scripps Research Graduate Program Faculty 8
Worldwide Impact of Scripps Research Scientific Discoveries 17

CFR 2.9 Promote Linkages of Scholarship, Teaching, Assessment, Student Learning and Service
Expectations of Scripps Research Graduate Program Faculty 8
Scientific Scholarship and Teaching and Learning 17

CFR 2.10 Demonstrate Students' Timely Progress Towards Degree Completion
Partnerships with Student Councils 17
Student Support Services 36
Physical and Mental Well-Being 38
Impact of Faculty Gender Variation on Students 62

CFR 2.11 Co-Curricular Programs Offered that Align with Academic Goals
Workshops on Academic and Career Related Needs for Students 17
Student Support Services 36
Physical and Mental Well-Being 38
International Student Support 39
Continuous Improvement of Student Support - Academic, Emotional & Career 60

CFR 2.12 All Students Understand Requirements of Program with Timely Advising
Graduate Office Monitoring of Student Progression 10
Engaging Students in Their Development, Learning and Success is a Strategic Priority 13
Feedback to Student from Chair of Advisory Committee 26

Feedback through the Rubrics 27
Extra Guidance As Needed 27
Graduate Office Provide Works with Student Goal Setting and Plans 28
Candidacy Meeting Feedback 29
Individual Development Plans 51

CFR 2.13 Support Services Provided – Tutoring, Career Counseling, Disability Support
Student Support Services 36
Physical and Mental Well-Being 38

CFR 2.14 Support for Transfer Students
Transfer Student Advising 35

Standard 3: Developing and Applying Resources and Organizational Structure to Ensure Quality and Sustainability

CFR 3.1 Committed Faculty and Staff of High Integrity and Qualifications
Strong Faculty Participation 8
Faculty Diversity and External Benchmarks 9
Junior Faculty Recruitment 16
Prestigious Faculty Honors 17
Faculty Communication with Institutional Leadership 17

CFR 3.2 Faculty and Staff Recruitment and Evaluation Aligned with Educational Objectives
Expectations of Scripps Research Graduate Program Faculty 8
Recruiting and Hiring Diverse Faculty 17

CFR 3.3 Sufficient Faculty Support Activities for Improving Teaching, Learning and Assessment
Expectations of Scripps Research Graduate Program Faculty 8
Faculty Development 17
Faculty Teaching Effectiveness 62

CFR 3.4 Institution is Financially Stable with Supporting Independent Audit for Long-Term Viability
Diversity of Revenue Sources 17
Increase Student Fellowships 61
Bicoastal Integration of Graduate Offices 61

CFR 3.5 Information Technology Sufficient and Aligned with Student Learning Outcomes
Upgrades to the Financial Management System 17
Upgrades to the Bicoastal Broadcasting Technology 52
Bicoastal Integration of Graduate Offices 61

CFR 3.6 Institution Leadership Accountable, High Performing, and Leads with Integrity
Prestigious Scripps Research President/CEO 8
Faculty Planning Committee 17

CFR 3.7 Decision Making Processes are Clear and Consistent with Purpose
Charters for the Committees of the Board 7
Faculty Planning Committee 17

CFR 3.8 Full-Time CEO, CFO and other High-Quality Leaders
President/CEO 8
CFO and Institutional Leadership 8

CFR 3.9 Independent Governing Board for Legal and Fiduciary Oversight
Charters for the Committees of the Board 7

CFR 3.10 Faculty Exercise Academic Leadership to Ensure Academic Quality and Educational Purpose
Faculty Planning Committee 17

Standard 4: Creating an Organization Committed to Quality Assurance, Institutional Learning and Improvement

CFR 4.1 Quality Assurance Processes in Academic and Non-Academic Areas
Guidelines for What Makes a Good Thesis 14
Institutionalizing Quality Assurance 18
Action Plans 24
Student Achievement Website 53

CFR 4.2 Institutional Research Capacity Consistent with Purpose
Institutionalizing Quality Assurance 18
Action Plans 24
Scripps Research Alumni & Friends Website 53

CFR 4.3 Leadership Committed to Improvement Based on Results of Inquiry and Evidence
Commitment to Improving the Scripps Research Graduate Education 18
Process for Mastering Program Learning Outcomes 25
Expectations Associated with an Exceptional Thesis 30

CFR 4.4 Engagement in Ongoing Inquiry into Teaching and Learning
Program Review Results 18
Evaluation of Entire Curriculum 42

CFR 4.5 Stakeholders Involved in Assessment
Research Training Self-Study Committee 28
Thesis Defended to Faculty Committee & Public 30
Alumni Network 61

CFR 4.6 Reflection and Planning of Strategic Position Based on Data and Evidence
Strategic Plan 13
Assessment of Student Learning Thru the Advisory Committee Meetings 14
Process for Mastering Program Learning Outcomes 25
Evaluation of Entire Curriculum 42
Upgrades to the Bicoastal Broadcasting Technology 52

CFR 4.7 Forward Thinking and Ready for Changing Landscape in Higher Education and Institution
Responding to Higher Education Changes 18
Diverse Career Path 22
Continuous Improvement of Student Support - Academic, Emotional & Career 60
Students' Career Progression and Professional Accomplishments 61

List of Appendices

Appendix 1-1: Bylaws 7
Appendix 1-2: Committee of the Board 7
Appendix 1-3: Scripps Research Organization Chart 8
Appendix 1-4: Faculty Handbook Guide 8
Appendix 1-5: Strategic Plan 2015-2025 ..... 9, 13
Appendix 1-6: Graduate Program Organizational Chart 10
Appendix 1-7: Gradate Program Committee Members 10
Appendix 1-8: WSCUC Educational Effectiveness Review Commission Feedback 3.7.2011 12
Appendix 1-9: Interim Report 3.1.2014 12
Appendix 1-10: WSCUC Interim Report Commission Feedback 12
Appendix 1-11: External Program Review Florida Report 11.3.2017 13
Appendix 1-12 External Program Review Peer Feedback for Florida 12.1.2017 13
Appendix 1-13 External Program Review Full Program (CA/FL) Report 12.1.2017 13
Appendix 1-14 External Program Review Peer Feedback for Full Program (CA/FL) 1.3.2018 14
Appendix 2-1: Inventory of Educational Effectiveness 18
Appendix 3-1: Career Taxonomy Guidance 22
Appendix 4-1: Curriculum Mapping Master with Requirements 25
Appendix 4-2: Graduate Program Rubrics 27
Appendix 4-3: Guide to Thesis Production 30
Appendix 5-1: 2018 US News & World Report 32
Appendix 5-2: Interview Weekend Schedule 34
Appendix 5-3: Career and Postdoctoral Services Office Annual Reports 2013-17 38
Appendix 5-4: International Services Office Annual Reports 2016-2017 39
Appendix 5-5: Student Groups and Clubs 39
Appendix 5-6: Counseling & Psychological Services Annual Summary 2016-2017 40
Appendix 6-1: Chemical Biology and Fundamental Biology Curriculum Review Reports 42
Appendix 6-2: New Graduate Student IDP 52
Appendix 6-3: Search Engine Optimization (SEO) Project Documentation 54
Appendix 7-1: Scripps Research (CA/FL) Financial Statements and Independent Auditor's Report 55
Appendix 7-2: Scripps Florida Financial Statements, Independent Auditor's Report & Compliance Report 55
Appendix 7-3: Graduate Program Budget FY 2017-2018 56
Appendix 7-4: Student Climate Survey 57
Appendix 7-5: Title IX Policy 58
Appendix 9-1: Graduate Student Council 60

Glossary of Terms

A

Active Student or Ph.D. Received – Rubrics
Only students who obtained a Ph.D. degree or are still active are included in the rubric analysis.

Academic Year – Faculty
The "Select Academic Year" filter allows selection of faculty that were active during specific time periods. For instance, selecting "2002 - 2003 (as of 7.31.2003)" will show only faculty who were active as of 7.31.2003. Reflects title as of date pulled because historical title is not tracked.

Academic Year
Academic Year is defined by the window of August 1 to July 31 and is labeled with the earlier year in the academic cycle. For example, academic year 8.1.2010 to 7.31.2011 is labeled 2010.

Academic Year: Faculty 1989-Present (All)
Captures all faculty members that have been active at Scripps Research as some point during the Program's history. Reflects title as of date pulled because historical title is not tracked.

Academic Year: Faculty Currently Active (as of date pulled)
Captures faculty members active as of the date data are pulled. Tableau workbooks should be connected to live data, so "Currently Active" will pull the faculty members that are active as of the time of viewing.

Admissions Research Interest
During the application process, prospective students are asked to identify their research interests from a list of 12 research areas including: biochemistry, cellular biology, chemical biology, chemistry, computational biology, genetics, immunology, microbiology, molecular biology, molecular medicine, neuroscience, structural biology.

Admissions Year
Admissions Year is determined by the application cycle during which an application is received. Applicants are placed into an application year based on the date the application is submitted.

Admit Rate
Admit rate is the percentage of students admitted who applied. (Applicants Admitted) / (Applicants Who Applied)

Admitted
Admitted indicates that a prospective student applied to the Scripps Graduate program and Scripps Research admitted the student.

Advisory Student Committee Meetings
The Advisory Committee meeting is a student's first meeting with her faculty advisory group. The Advisory Committee meeting serves as an opportunity for students to meet with their committee members and begin to formulate a feasible thesis project.

Alumni Research Interests
Research areas associated with alumni from when they were Scripps Research graduate students include the 8 research areas of: biology, biophysics, chemical biology, chemistry, MCSC, immunology, microbiology, custom.

American Indian or Alaska Native – Ethnicity
A person having origins in any of the original peoples of North and South America (including Central America) and who maintains tribal affiliation or community attachment.

Analysis – Explicit Critical Thinking Learning Outcome
Analysis and interpretation of data and research results are explicit learning outcomes associated with the core program learning outcome of critical thinking.

Analysis by Identifying/Selecting Methodologies – Explicit for Research Learning Outcome
Effective experimental strategies, controls, collaborations, analysis, interpretations, and understanding of emerging problems are explicit learning outcomes associated with the core program learning outcome of analysis in identifying and selecting methodologies for research.

Applicant
All applicants are on a Ph.D. track during admissions, so it is unnecessary to filter out students by their degree type.

Applied
Applied indicates that a prospective student has submitted an application to the Scripps Research Graduate Program.

Asian – Ethnicity
A person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent, including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam.

B

Black or African American – Ethnicity
A person having origins in any of the black racial groups of Africa.

Box Plots – Course Evaluations
Box plots summarize the distribution of data points. The box represents the Inter Quartile Range (IQR), with the bottom of the box marking the 25th-percentile, the top of the box marking the 75th-percentile., and the middle of the box representing the median value. The outer whiskers indicate the range of data points that are not considered outliers. Any points below the lower whisker or above the upper whisker are considered outliers.

C

CA and FL Campus – Courses
Represents course directors from both campuses who co-direct a course.

Calendar Year
Calendar Year is defined by the time period from January 1st thru December 31st and is labeled with earlier part of the year. For example, 1.1.2010 thru 12.31.2010 is displayed as 2010.

Candidacy – Student Committee Meetings
The Candidacy meeting is a two-part (oral and written) exam that is intended to determine if the student has acquired sufficient knowledge in the area of study to warrant admission into candidacy for the Ph.D. degree and to survey the student's ability to undertake dissertation research.

Class Year
Clear year defines the incoming enrolled class of students from the admissions cycle who start together. Class Year groups the incoming students into a class. To account for early and late arrivals, the timeframe to group students into a class is May 1 to April 30. A class year is labeled with the earlier year in the time range. For example, 4.30.2011 is labeled 2010.

CLO Number
CLO Number is the number that indicates the order of a specific course learning outcome.

Cohort Year
Cohort Year aligns with Class Year but take any transfer years into account by (see Program Year at Enrollment entry for details on how transfer years are determined). For example, a student who enters 5.1.2010 and has completed two full years at another program is in cohort 2008.

Committee Score – Admissions
The scale for Committee Scores ranges from 1 to 4 and assigns lower numeric values to applicants having a stronger fit for the Scripps Research Graduate Program.

Communications of New/Expanded Science Knowledge - Explicit for Research Learning Outcome
Communicating effectively with others and utilizing new and expanded science knowledge are explicit learning outcome associated with the core program learning outcome of research skills.

Content – Explicit for Oral Presentation Learning Outcome
Significance justified, represents field, references others' work, original and appropriate for audience are explicit learning outcomes associated with the core program learning outcome of oral presentations content.

Course Evaluation Question Type
The course evaluation questions are completed at the end of every course and include the five assessment categories of: (1) course content and structure; (2) teaching; (3) grading and feedback; (4) the four-core PLO's (research, writing, oral presentation, & critical thinking), and (5) the specific custom course learning outcomes.

Course Learning Outcomes
Course learning outcomes are specifically aligned to the teaching content of each course. Course learning outcomes are written by the course director with input from course lecturers and Graduate Office personnel.

Course Director
A course director is the primary faculty member who oversees a given course and is responsible for the full design, directing and evaluation of the course. Other faculty may lecture for a course and provide input to the course director.

Course Evaluation Score Scale
4 - Strongly Agree, 3 = Agree, 2 = Disagree, 1 = Strongly Disagree

Course Research Area
Courses are grouped around 10 research areas including: chemical biology, chemistry, immunology/microbiology, laboratory research & thesis, MCSC, molecular biology, molecular medicine/physiology, neuro-science, professional development for scientists, structural biology/biophysics.

Credits
Credits indicates the number of credits associated with a course. Three credits are the standard number of credits per course. Some boot camp courses, ethics, online tutorials, short courses and research experiences (rotations & thesis laboratories) may be offered for 0,1,2,6,9 and12 credits.

Criteria Grouping – Rubrics
A criteria grouping represents the category of like questions asked in a rubric.

D

Data Representation –Explicit for Writing Learning Outcome
Effective data format and clear and logical data presentation are explicit learning outcomes associated with the core program learning outcome of data actual or conceptual in writing.

Delivery – Explicit for Oral Presentation Learning Outcome
Comfortable approach, alignment with audience, clear and concise, and ability to respond to questions are explicit learning outcomes associated with the core program learning outcome of delivery of oral presentation skills.

Design: Generate Research Ideas –Explicit for Research Learning Outcome
Development of research project, methods approach, creativity, and knowledge of research field are explicit learning outcomes associated with the core program learning outcome of designing research.

Design: Multidisciplinary Perspective –Explicit for Research Learning Outcome
Considering multi-disciplinary perspectives when designing research approach, methods, techniques, analysis and communications approach are explicit learning outcomes associated with the core program learning outcome of developing research skills.

E

Enrolled
Enrolled indicates that a prospective student applied to the Scripps Research Graduate Program, Scripps Research admitted the student and the student chose to ***enroll*** at Scripps Research for their Ph.D. program.

Enrollee Count – Courses
Captures students who have enrolled in a course and have Scripps Research ID.

Ethics – Explicit for Writing Learning Outcome
Data accurately presented, and citations thoroughly presented are explicit learning outcomes associated with the core program learning outcome of ethics in writing.

Experimental Strategies – Explicit for Critical Thinking Learning Outcome
Strong research design and experimental strategies are explicit learning outcomes associated with the core program learning outcome of critical thinking skills.

Explicit - Learning Outcomes
Explicit learning outcomes further delineates the specific learning associated with each of the four PLO's (research, writing, oral presentation and critical thinking).

F

Faculty Academic Year
Faculty status is determined by checking whether a faculty member was active on the final day of a given academic year (7.31). For example, a faculty member is considered active for Academic Year 2010 if he or she is active on 7.31.2011 (the last day of the 2010 Academic Year).

G

GPA
GPA scores are on a 4.0 scale. Scores that do not align with the 4.0 scale (e.g., 10-point scale) are ignored in the calculation of metrics.

Grad Program Affiliation
This faculty title category includes the titles: assistant professor adjunct, associate professor adjunct, professional scientific collaborator, professor adjunct, and professor emeritus.

Graduate End Year %
Graduation rates (indicated by % Graduate End Year) are calculated by considering the number of students who had the ***ability*** to graduate in a specific Program Year against the number of students who ***actually*** graduated by that year: (# students who graduated by Yr. X) / (# students who had chance to graduate by Yr. X).

Graduation Year
Graduation Year is defined by the timeframe of August 1 to July 31. Graduation year is labeled with the first year in the time range. For example, 8.1.2010 to 7.31.2011 is labeled 2010.

H

Hispanic or Latino – Ethnicity
A person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin, regardless of race.

I

Insightful –Explicit for Critical Thinking Learning Outcome
Addresses new perspectives and brings originality are explicit learning outcomes associated with the core program learning outcome of critical thinking skills.

Interview Score – Admissions
The scale for Interview Scores ranges from 1 to 4 and assigns lower numeric values to applicants having a stronger fit for the Scripps Research Graduate Program.

L

Laboratory Research & Thesis Course Credits
Course credits for Laboratory Research & Thesis may vary from 3 to 12 credits. When more than one section of the course exists during the same quarter, the maximum number of credits is reflected in the metric.

Laboratory Technique Skills –Explicit for Research Learning Outcome
Technical skills and notebook records are explicit learning outcomes associated with the core program learning outcome of developing research skills.

Lecturer
A lecturer is responsible for conveying one or more topics through lectures. A lecturer may also be a course director and may or may not be a member of the Graduate Program faculty. Lecturers have been chosen for their high level of knowledge on a topic.

M

Mechanics – Explicit for Writing Learning Outcome
Sentence structure, grammar, punctuation, formatting, and concise writing are explicit learning outcomes associated with the core program learning outcome of mechanics of writing.

Mid-Atlantic – Geographical Origin
Consists of the following states: MD, PA, NJ, DE, NY.

Midwest – Geographical Origin
Consists of the following states: ND, SD, NE, KS, MO, IA, MN, WI, IL, IN, MI, OH.

N

Native Hawaiian or Other Pacific Islander – Ethnicity
A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.

New England – Geographical Origin
Consists of the following states: VT, NH, MA, CT, ME.

Non-Scripps Research External Faculty – Courses
Represents course lecturers and external faculty with a specialized knowledge that is generally not available among the Scripps Research faculty. These faculty are not on the Scripps Research faculty. Primarily represents UCSD ethics professor.

Non-tenured – Faculty
Non-tenured positions do not create any right or entitlement to a future appointment. Non-tenured faculty may receive a series of appointments, each of a definite term, that, when taken together, are no more than eleven years.

Non-US Citizen – Demographic Grouping
Non-US Citizens are either permanent residents (e.g., refugee, asylee, green card holder) in the United States or are on a temporary visa.

O

Oral Presentation Rubric
The oral presentation rubric includes the three criteria groupings of content, organization, and delivery. These criteria groupings are further delineated into specific areas of focused learning that are rated on a scale of 1-Emerging, 2-Developing, 3-Proficient, and 4-Insightful.

Organization – Explicit for Oral Presentation Learning Outcome
Clear and logical, effective slides, hypothesis accurately stated, time managed, and topics well balanced are explicit learning outcomes associated with the core program learning outcome of organization of oral presentation skills.

Original Research Proposal Committee Meetings
The Original Research Proposal (ORP) Examination serves as a demonstration of the student's ability to apply the skills and knowledge acquired during the student's Ph.D. work on a research topic outside of the student's area of study.

Other – Grading
Grades are not applicable to certain courses (e.g., laboratory and research) so the grading type is classified as Other.

Other – Course Director Title
Course Directors with a title of Other include the following positions: VP Business Development, President/CEO, Sr. Staff Scientist, VP Business Development.

Other – Lecturer Position Title
Lecturers with a title of Other include the following positions: VP Business Development, President/CEO, Sr. Staff Scientist, VP Business Development, Dir of STSI EVP, Institute Investigator, Scientific Director, Scripps Fellow, Sr. Dir Shared Services, Dir Tech Development.

P

Ph.D. Received – Alumni Employment
Students who obtained a Ph.D. or MD/Ph.D. degree are included in the alumni employment analysis.

Proficiency (3 levels) – Learning Outcomes
Expected Level of Learning: Introduce, Reinforce, Master.

Program – Learning Outcomes
The four Core Learning Outcomes include: Research, Writing, Oral Presentation and Critical Thinking.

Program Year – Years
Program Year is used for point-in-time calculations by looking at a specific year during a student's career, relative to his or her Cohort Year. For example, analysis of Program Year = 2 for a student with Cohort Year 2010 will look at the student's activity during the 2012 year.

Program Year at Enrollment – Years
Program Year at Enrollment defines any years that a student has completed at another institution. These are mainly used to calculate Cohort Year.

Proposal Writing Rubric
A separate proposal writing rubric was used during academic years 2009-2014, specifically 8.1.2009 through 7.31.2015. The separate proposal writing rubric was only used at the Original Research Proposal (ORP) meetings and included the criteria groupings of originality, significance, organization, scholarship, and style and mechanics. On 8.1.2015, the key criteria groupings of the proposal writing rubric were merged into the existing writing rubric. The proposal writing criteria groupings of ***originality*** and ***significance*** were added to the writing rubric and are assessed during the ORP meeting.

R

Research Rubric
The research rubric includes the five criteria groupings of design, technical skills, analysis, communications, and work habits. These criteria groupings are further delineated into specific areas of focused learning that are rated on a scale of 1-Emerging, 2-Developing, 3-Proficient, and 4-Insightful.

Research and Online Courses
Courses labeled Research and Online are courses that are not held in a traditional classroom. These include courses that are conducted virtually (i.e., online) or courses that involve laboratory work or independent research.

Research Field – Explicit for Critical Thinking Learning Outcome
In-depth knowledge of research field is an explicit learning outcome associated with the core program learning outcome of critical thinking.

Retain End Year %
Retention rates (indicated by % retain end year) are calculated by considering the number of students who had the ability to reach a specific program year against the number of students who were actually retained through that year: (# students who were retained through yr. x)/ (# students who had chance to reach yr. x).

Retention Rates by Demographic Grouping
Demographic groupings (URM, Gender, Citizen) comprise mixed cohort years, so students have not all had time to reach the same point in their graduate career. For instance, for 2017, cohort 2008 will be factored into retention/graduation rate calculations for years 1-8. However, this 2008 cohort has not reached its 10th year. Thus, retention could reflect 100% for those students who have not reached the 10th year.

S

Scholarly Approach – Explicit for Writing Learning Outcome
Clear hypothesis, evidence for assertions, objective interpretations of findings, and accurate representation of literature are explicit learning outcomes associated with the core program learning outcome of scholarly approach to writing.

South – Geographical Origin
Consists of the following states: AR, LA, MS, TN, AL, KY, SC, GA, FL, WV, VA, NC.

Southwest – Geographical Origin
Consists of the following states: AZ, NM, TX, OK.

Student Research Interests
Research interests associated with students include the following 17 research areas: biochemistry, biology, biophysics/ structural biology, cell biology, chemical biology, chemistry, computational biology, custom, genetics/genomics, immunology, MCSC, microbiology, molecular biology, molecular medicine, neuroscience, other.

T

Tenured – Faculty
Tenured positions are appointments for an indefinite period during which Scripps Research guarantees retention of rank and its privileges, subject to certain unusual circumstances.

Thesis Defense – Student Committee Meetings
The final requirements for the doctoral degree are the preparation of a written thesis and an oral defense of the thesis.

Thesis Update – Student Committee Meetings
The Thesis Update Meeting provides an opportunity to discuss the progress of the student's thesis project including experiments (successful and unsuccessful), changes in project direction, and any broader issues.

Time to Degree
Time to degree is the average number of years it took a specific cohort to graduate, where only students who obtained a degree are considered.

Title: Adjunct Faculty
This faculty member's primary appointment is outside Scripps Research, but the faculty member is still connected to grants and/or has space at Scripps Research.

Title: Assistant Professor
The rank of Assistant Professor is an entry level appointment made for a specified term and does not carry tenure.

Title: Associate Professor (with tenure)
The rank of Associate Professor is an intermediate appointment and carries tenure.

Title: Associate Professor (without tenure)
The rank of Associate Professor (without tenure) is an intermediate appointment that is made for a specified term and does not carry tenure.

Title: Department Chair
This faculty title is administrative and is responsible for the planning, administrative services and coordination of personnel, space and equipment for the conduct of the Department. A Department Chair must also be a full tenured professor.

Title: Emeritus
This faculty member is retired or semi-retired and generally retains an honorary position with Scripps Research

Title: Of Subject Faculty
Faculty of Subject are not on the tenure track but may hold a position as a Professor of Subject, Associate Professor of Subject or Assistant Professor of Subject based on expertise in their scientific field.

Title: Professor – Faculty
The rank of Professor is the highest appointment and carries tenure.

Transfer-Out Ph.Ds., Left with MA or MS
Students who transferred-out with a Scripps Research advisor and who remain on an uninterrupted path to pursue their Ph.D. or students who graduated with a terminal MA or MS are not considered in the calculation of retention or graduation rates.

U

Unknown – Ethnicity
A person whose ethnicity encompasses two or more of the aforementioned groups. Note that in Admissions, students may elect to not disclose their ethnicity, and in this case, they will also be classified as Unknown. SRD requires ethnicity selection.

URM – Demographic Grouping
Underrepresented Minority (URM) includes Hispanic/Latino, Black/African American, and Native Hawaiian/Pacific Islander. Only US Citizens are included as URMs. A student whose ethnicity is URM but is not a US Citizen will be classified as Non-US Citizen (Temp. Visa).

US Citizen – Demographic Grouping
Student has US Citizenship.

W

West – Geographical Origin
Consists of the following states: WA, OR, CA, NV, ID, MT, WY, UT, CO, AK, and HI.

White – Ethnicity
A person having origins in any of the original peoples of Europe, the Middle East, or North Africa.

Work Habits – Explicit for Research Learning Outcome
Focus, commitment, time management, and persistence are explicit learning outcomes associated with the core program learning outcome of research.

Writing Rubric
The writing rubric includes the five criteria groupings of organization, scholarly approach, data, mechanics, and ethics. The criteria groupings for originality and significance are present at the end of the writing rubric and are only assessed during Original Research Proposal (ORP) meetings. The criteria groupings are further delineated into specific areas of focused learning

that are rated on a scale of 1-Emerging, 2-Developing, 3-Proficient, and 4-Insightful.

Y

Years Active – Faculty
In Tableau, years when faculty are active is determined by taking a snapshot of active faculty on the last day of a given academic year. For example, when looking at the academic year 2005 to 20016, only faculty who were active on the day 7.31.2006 (the last day of academic year 2005 - 2006) will be considered active.

Yield Rate
Percent of students who enrolled in the program: (Enrolled Students)/(Applicants Admitted).