

College of Biological Sciences
FY20 COMPACT



College of
Biological Sciences
UNIVERSITY OF MINNESOTA

STRATEGIC PRIORITIES

1. Increasing financial and logistical support for graduate students and post-doctoral researchers.

Strong graduate programs and graduate student support are essential for maintaining our research excellence and for producing the next generation of problem solvers. Since an increasing number of our graduate students and postdocs are pursuing careers outside of academia, we are continuing to grow professional development opportunities that better prepare these young scientists for careers in the private sector, government and non-governmental organizations, as well as in academia.

- We continue to devote resources to our graduate student/postdoc professional development Emerge BioScience Program in the amount of \$11,000 for FY19.
- We invested \$355,000 of our balances to cover graduate student (non-TA) cost increases, spurred by three phenomena: increased costs of stipends due to market increases, more highly active research faculty, and exceptional applicants for our programs.

2. Catalyzing research through recruitment, retention, and recognition of field-shaping faculty.

CBS will advance current strategies to showcase distinguished research and faculty by nominating faculty for prestigious awards, strengthening faculty mentoring at all levels, and increasing recognition and communication of faculty achievements. In FY19, the University had a record-setting year in competing for external research funding. CBS' rate of increase was nearly double the University's. Eight percent of CBS faculty are members of the American Academy of Arts and Sciences - a higher proportion than in any other UMN college - and we have two Howard Hughes Medical Institute Investigators – the only HHMI Investigators in UMN history. Additionally, CBS houses 7 of the 21 University of Minnesota faculty members named Highly Cited Researchers by Clarivate Analytics (2018).

- In September 2018, we invested in a new Head of the Biology Teaching and Learning department. This transition will be accompanied by three new tenure-track positions. Recruiting will begin Fall 2019.
- CBS appointed a new head of the Genetics, Cell Biology, and Development department in January 2019. This transition will be accompanied by two new tenure-track faculty positions (plus three additional positions provided by the Medical School). Recruiting will begin Fall 2019.
- Our most outdated buildings, the BioSciences Center, Snyder Hall and Gortner Lab (all on the St. Paul Campus) continue to require renovation. We invested \$3.5M over the last four years toward upgrading research spaces in these buildings, on top of the \$4M we invested in a major renovation of faculty research space (aided by a loan) in the BioSciences building. We continue to invest heavily in our field stations to promote and strengthen the research activities that they support.

3. Continuing to grow our undergraduate enrollments while maintaining excellence of our programs.

This involves ensuring that sufficient, high-quality research and teaching infrastructure, including state-of-the-art laboratory space, is in place and that we address bottlenecks that could negatively impact quality.

Renovations to create Active Learning Laboratories in the Biological Sciences Center will be completed by May 2019. This new space will allow us to teach more students using cutting-edge pedagogies in which students conduct authentic research in their Foundations of Biology lab courses. Additionally, CBS significantly increased the number of four-year scholarships available for incoming freshmen and is continuing these efforts as part of our campaign. In FY18 we awarded 84 four-year scholarships, well on our way to achieve our campaign goal of 100.

- The HHMI grant on Pathways to Student Success (\$1.2M) implemented three core initiatives targeting elevated retention and graduation rates, persistence in the sciences and transformational instructional methods. The grant is coming to an end, and resources are needed to ensure continued sustainability of key initiatives: peer mentoring, faculty training in inclusive excellence, and assessment of student retention and success factors. CBS invested \$200,000 in matching funds to the HHMI grant, and will need to absorb one FTE and associated costs to continue these valuable programs that will benefit the entire University.
- The NSF grant on Integrated Science Education for Discovery in Introductory Biology (In-SciED-In) (\$1.9M) developed inquiry-based labs for almost all of the non-majors biology courses and revamped the Foundations of Biology lab courses to provide students with rigorous, authentic research experiences. The grant is coming to an end and resources are needed to ensure continued sustainability of key initiatives, including analysis of types of research experiences contributing to high-level learning of scientific process skills. CBS invested over \$100,000 in getting this highly successful program off the ground and will require recurring resources to continue this program.
- Part of our strategic planning to increase enrollments while maintaining excellence involves increasing support for Graduate Teaching Assistants (GTAs). Until now, CBS used balances to pay the additional cost of GTAs, up to \$350,000 for each year FY18 and FY19. We studied how to both reduce costs as well as define need in this space, and determined that a major investment is required to fund the gap.

4. Increasing diversity at all levels.

Whereas the diversity of CBS' undergraduate population is greater than the University average, there is room for improvement in attracting and supporting underrepresented groups of students. We provide faculty and staff training on inclusive teaching and advising practices and are responding to graduate student requests for the same. Through our Dean's Scholars Program and other initiatives, we are building leadership skills and offering peer mentoring to enhance student success. Increasing faculty diversity is also high on our list of priorities and most difficult for us to improve. We are continuously strengthening our faculty search process with a focus on diversity.

- CBS advocated for the University to join the University of California Partnership for Faculty Diversity. This year CBS is accepting applications for the President's Postdoctoral Fellows Program in two of our departments (BMBB and EEB). Pending qualified applicants, these postdoctoral fellows are expected to continue as tenure-track faculty once their postdocs are completed. We anticipate directing \$150,000 of our current resources to on-board two postdocs.
- For our graduate programs, we leveraged provostal support and initiated financial incentives to help programs attract diverse talent. We continue to redirect \$40,000 of graduate support to students who are from underrepresented groups.

5. Building and enhancing research collaborations across the College of Biological Sciences sub-disciplines and between CBS and other public and private partners.

Today's science is a team effort, and finding solutions to the complex challenges that we face requires the effective integration of diverse and complementary perspectives and technologies. Through the Biotechnology Institute and MnDRIVE initiatives, interdisciplinary research and industry partnerships continue to expand.

- CBS provides critical financial support to shared research infrastructure and initiatives and multi-collegiate events that foster research collaborations. For example, Cedar Creek Ecosystem Science Reserve is globally recognized for its long-term ecological research and attracts scientists from across the University and internationally. This year, Itasca Biological Station and Laboratories established a new seed grant program, Seed-to-Roots, to support place-based science that is open to all UMN faculty. In addition, CBS supports the following interdisciplinary facilities, providing over \$4M of annual support and/or space:
 - Biotechnology Institute
 - MnDRIVE
 - Center for Mass Spectrometry and Proteomics
 - University Imaging Centers
 - University of Minnesota Genomics Center
 - Developmental Biology Center
 - Center for Genome Engineering
 - Microbial and Plant Genomics Institute
 - Center for Plant Precision Genomics
 - University of Minnesota Lion Center

CBS distributes more than \$150,000 annually to support interdisciplinary collaborations, events, and symposia, including:

- Norwegian Centennial Chair Collaboration
- Journal of Young Investigators
- Moos Lecture Series
- Conferences organized by American Society for Virology; Institute for Molecular Virology; iCOMOS; International Society for Behavioral Ecology; and others
- The Biotechnology Resource Center (BRC), which is part of UMN's Biotechnology Institute, provides corporate clients with state-of-the-art microbial fermentation facilities to aid their production and R&D efforts on a fee-for-service basis. Largely due to space limitations, the BRC cannot keep up with demand. We are working to expand the BRC through the addition of a new building and better microbial production space. The expansion will include broadening its scope to further contribute to the mission of the University and CBS. This initiative aligns with the St. Paul Campus Framework Plan. CBS anticipates investing approximately \$150,000 on pre-design for this new priority.
- CBS continues to invest over \$260,000 annually in the Grand Challenges in Biology Postdoc Program designed to jumpstart new collaborations within CBS and between the College and other units in areas related to Grand Challenges themes. To date, this highly competitive program has funded 10 postdocs pursuing research that spans disciplines and brings together labs from different departments within and beyond the College.

- Takeda Pharmaceuticals is implementing a large-scale workforce project and seeking educational supplementation from CBS related to good manufacturing practices that adhere to FDA guidelines. The in-person teaching modules will be used to support Takeda Corporation's workforce training. These courses will be developed into additional industry partnerships, and will be modified for graduate and undergraduate level course offerings. CBS has committed to renovating to provide suitable lab space, and will invest \$100,000 as matching funds to this endeavor.

6. Expanding our outreach and community engagement efforts.

CBS spent the last several years ramping up outreach and community engagement efforts at our field stations, conservatory, and through other initiatives (i.e., Petri Dish Biology Themed Conversation Series; Market Science Community Engagement Program; InSciEd Out STEM Pipeline Program). While our progress has been notable, there is a pressing need for greater sustainability and coordination of the College's outreach and engagement efforts.

- We redirected additional resources and found donors to support all of these endeavors: \$12,000 toward Petri Dish, \$80,000 toward Market Science, and \$2,500 toward SciSpark.
- Plans are in development to create a CBS Science Communication Exchange that would act as a platform for increasing impact across our public engagement and science communication efforts by identifying opportunities and affinities across campus, delivering education and training, and providing creative services to researchers in ways that emphasize interdisciplinary collaboration.

7. Making progress toward our CBS campaign goals.

- As of February 20, 2019 we raised \$3M this fiscal year, achieving 100% of our \$3M fiscal year goal early, and are still fundraising.
- We raised \$17.6M toward our overall campaign goal of \$21M (84% of goal with about two years to go).