

**College of Biological Sciences**

**University of California, Davis**

**Five Year Recruitment Plan**

**CBS 2020**

**“Science of Life, Science for Life”**

April 1, 2015

## The College of Biological Sciences: Present and Future

The College of Biological Sciences (CBS) is home to five departments, three centers and one organized research unit. On a campus that is almost 80% life sciences in focus, CBS is the home of fundamental biological research that spans the full hierarchy of natural organization from the sub-molecular, to cellular, organismal, population and entire ecosystems. In focusing on excellence in fundamental, mechanistic areas of biology, CBS faculty members are critical contributors to a wide range of applied areas of science both within and outside the college. In this regard, the college endeavors to engage in the “science of life as science for life”. CBS has leveraged its reputation for cutting-edge research in attracting 5,460 undergraduates across 9 majors, and over 400 graduate students. As a cornerstone in the education of all biological science students at UC Davis, CBS continues to recruit top scholars to maintain its leadership position nationally and internationally. Among 120 CBS faculty, many are decorated scholars/distinguished professors or members of esteemed academies. Their scholarship is supported by grants from NIH, NSF and other federal agencies as well as foundations including Gates, Howard Hughes Medical Institute, and Packard. In 2013-2014 CBS faculty members generated over \$14M in indirect cost returns from external funding awarded in support of their research. The high caliber of the CBS faculty allowed the college to attract and recruit outstanding new junior and senior faculty including a member of the National Academy of Sciences and a recently named Packard Fellow. Building on a decade of success since its 2005 inception, we look to 2020 aiming to meet the challenges of modern biological research and offering the best educational experiences to students, while continuing our commitment to excellence.

The CBS five year hiring plan builds on important recruitment activity since the faculty established the current vision in 2010, and nurtures the CBS strength in the core areas of biology while growing in some emerging disciplines. Recent recruitment has introduced greater diversity to faculty and staff, and begins to engage more LPSOEs to enhance instructional innovation and pedagogical impact while boosting our teach capacity. Our plan includes an aggressive inclusion of LPSOEs that will allow lecturers to ultimately make up about 10-15% of our college faculty. Doing so is necessary to make sure that ladder faculty can maintain the necessary balance of teaching and research to sustain world class scholarship in the college. Over the next five years we plan to solidify our strengths in basic biological discovery while building additional strengths in translational research so that acquired knowledge can be translated into solving key societal concerns. This is essential to our vision of CBS as the exemplar of New Biology (see below). Successful execution of the proposed hiring plan will reinforce its standing as one of the top biological sciences units at the national and international level.

### Looking Forward

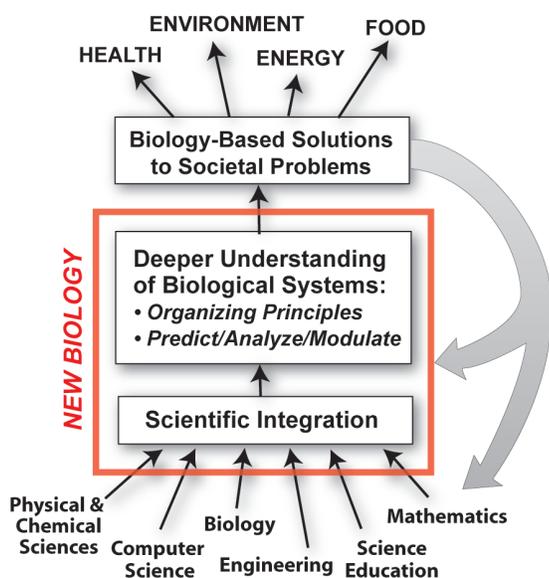
New hires over the last four years followed the 2011 Report of the CBS Vision Committee that focused on human, integrative, quantitative and systems biology areas. This underscored the mandate to accelerate existing research strengths, prioritize 21st century endeavors, and lead new campus-wide life sciences research networks. The new plan iterates this philosophy by proposing appointments that continue to advance essential areas of basic biological studies. These include **Human Biology and Health Sciences**, where we will build on existing strengths in neurobiology, physiology, chromosome biology, comparative and functional genomics, and other mechanistic programs at all levels of biological organization; **Biodiversity**, where we focus on comparative approaches across the biological hierarchies, mechanisms of population and community dynamics, and the highly integrative fields of ecosystem functioning; and **Physical Biosciences**, where we anticipate a major international push in understanding molecular mechanisms of harnessing natural biological innovations for human gain. In addition, our ambition is to build in the emerging and highly integrative areas of systems, synthetic biology, and computational biology. Growth in these research areas will spur related instructional programs, advanced computational infrastructure, and broad synergies with departments in other UC Davis colleges and schools.

## Rising to Grand Challenges

Now more than ever, as mankind faces health, environment, food, and energy challenges of unprecedented magnitude, life sciences stands as *the central discipline* able to make vital contributions to tackle these challenges. Solving these problems will require deeper understanding of the basic mechanisms of life. Progress in basic biological mechanisms is needed whether we are fighting the impact of major diseases, harnessing the ability of organisms to turn sunlight into renewable energy and resources, developing strategies to use antibiotic drugs in ways that limit the ability of microbes to evolve resistance, or predicting the impacts of a changing climate. It is therefore our strategy to continue building strengths in these core areas, while targeting some of the most pressing societal challenges for added focus. Convergence of fundamental knowledge gained from different disciplines will offer a comprehensive backdrop against which unique formulas can be developed to address life's most pressing concerns.

## Harnessing Big Data

Modern biology brings with it large-scale high-throughput contemporary approaches, and the need to house and process unprecedented quantities of data. Indeed, today 'big data' forms the basis for powerful, progressive computational analyses, and translation of results to a wide range of scientific applications. New hires will bring advanced capabilities for generating, analyzing, and modeling such data. Hiring into disciplines that maximize data mining pushes the threshold for discoveries and promises new frontiers in pursuit of efficient production systems (synthetic biology), advanced modeling capabilities (computational biology) and integrated projections (systems biology). Breakthroughs in other specialties, like chromosomal biology, will enable CBS to make lasting contributions to campus-wide initiatives underway in the areas of food, energy, health and the environment. The National Academies' "New Biology" model captures this comprehensive, multi-disciplinary dynamic (Figure 1).



**Figure 1.** New Biology relies on integrating knowledge from many disciplines to derive deeper understanding of biological systems, allowing the development of biology-based solutions to societal problems, and enriching the individual scientific disciplines that contributed to the new insights. Source: *The National Academy of Sciences. Report in Brief – A new Biology for the 21<sup>st</sup> Century. (2009).* Retrieved from [http://dels.nas.edu/resources/static-assets/materials-based-on-reports/reports-in-brief/new\\_biology\\_final.pdf](http://dels.nas.edu/resources/static-assets/materials-based-on-reports/reports-in-brief/new_biology_final.pdf)

## **CBS is a Leader in Campus-wide Research Networks**

The greatest impacts of science have emerged from efforts that integrate across disciplines. CBS has been a campus leader in shaping research and teaching networks that capitalize on the full range of expertise on campus. Over 80% of our 120 faculty members have joint appointments in other campus units (55 with AES appointments, 15 with SOM appointments, and six with joint appointments in L&S or CAES). We are the only college on the campus with lead dean responsibility for 100% graduate groups, as opposed to department-based graduate programs. All of these graduate groups include participating faculty from departments outside CBS. In addition to serving our own students, our course offerings are essential for various majors in CAES (including nutrition, animal science, wildlife, fish and conservation biology), L&S (psychology and anthropology), and for all students in STEM disciplines within CAES, MPS and Engineering. Some of the most successful and exciting research groups on campus are housed within our centers and ORUs. The Center for Neuroscience, Center for Population Biology and Genome Center have all been tremendous successes that capture these synergies and have helped the campus place high in national and international rankings. CBS also houses the new Coastal & Marine Sciences Institute that brings campus research in marine systems under a single umbrella and offers our university's first cross-college undergraduate major. CBS has a strong relationship with some other campus units. These include the School of Medicine and some of its initiatives, including the Comprehensive Cancer Center and their focus on developing cancer genomics. Our hiring plan is designed to build our core strengths in areas of biology that are fundamental while still developing ties to all of these, and other campus initiatives.

One of the keys to highly successful research is the availability of facilities that house major instrumentation and technologies, or otherwise make possible specific research agendas. CBS is a major contributor to the administration and support of campus research facilities. These include the Light Microscope Facility, managed within our Department of Molecular and Cellular Biology, that makes cutting edge imaging available campus-wide. The Controlled Environment Facility, one of the largest of its kind on a university campus, manages and oversees the use of a wide range of controlled environment plant growth chambers that are crucial to plant research across campus. This facility, managed by our Department of Plant Biology in conjunction with OVCR, operates in parallel with the CBS Greenhouse Facility, which provides space and facilities for production of research plants used in research across the college and campus. The Bodega Marine Laboratory, housed administratively within the Coastal & Marine Sciences Institute, is the centerpiece of marine research facilities at UC Davis. It houses 10 campus faculty members and is one of the only marine labs in the world located in a major upwelling region. In addition, the Genome Center houses and administers critical service cores in next generation genome sequencing, bioinformatics and a regional center in metabolomics and proteomics. Our departments and centers provide the intellectual home for our research disciplines, but the physical facilities are crucial to the ongoing success of campus research.

## Five Year Hiring Plan Overview

CBS proposes to hire at least 40 new faculty members over the next five years. A combination of current financial challenges and space constraints lead us to propose that we hire at a modest rate in years 1 and 2 with five new recruitments per year during this period. This will be followed in years 3-5 by a more robust recruitment of 10 or more new faculty each year. Following a comprehensive internal analysis of the instructional, financial and intellectual impacts, we have a target of 10-15% LPSOE faculty in the college. To reach this balance across the college 12 to 20 of our hires will be LPSOEs and 28 to 46 will be regular faculty. To help nurture and leverage this elevated number of teaching faculty members, we plan to develop a Center for Innovative Teaching in Biology that will focus on developing and implementing creative and effective instructional practices and activities. Following several years with a focus on junior hires in our research faculty, we expect 30% of our ladder faculty hires to be at the Associate or Full Professor level to maintain the appropriate balance of junior and senior faculty. This investment in senior hires will allow us to move strategically into rapidly emerging areas of particular significance, while recruiting individuals who already have achieved top international recognition. Our analysis indicates that we can expect some 14 retirements during the five year period so this plan will produce a net growth of our college to approximately 136 to 160 faculty members of which 18 to 26 would be LPSOEs. Below we summarize hiring plans for the five CBS departments, two of our centers and the Coastal & Marine Sciences Institute (CMSI). Some of the hiring that is done over the next five years into our centers and CMSI will not be initiated within CBS and many of these hires will not have appointments in CBS departments. Nevertheless, we include their hiring plans to illustrate the strong synergy between our college hiring plan and the activities of these units with which we are closely allied.

## Space for Research Laboratories and Offices

The offices and laboratories of the 120 CBS faculty members are primarily located in three buildings on campus (Briggs, Life Sciences, and Storer Hall) with 10 faculty located at the Center for Neuroscience, five faculty at the Genome Center, three faculty stationed at the Bodega Marine Laboratory and one at the Center for Mind and Brain (for which CBS is not the lead dean). The recent SLOAC report concluded that CBS has an exceptionally efficient pattern of space use and that we are space constrained for growth. In fall of 2015 we will have space available for 5 new regular faculty in the three core buildings of the college. While we anticipate 14 retirements over the five year period of this plan we expect that we will recoup only about half that many research lab spaces as many faculty retire while still holding research grants or do not hold significant research space at the time of their retirement. Thus we estimate that we have space for a net of 12 new regular faculty. ***Our plan to hire 40 to 66 new faculty requires laboratory and office space for 16 to 42 research faculty and office space for the 12 to 20 LPSOEs. Assuming somewhat greater space needs for senior research faculty recruitments this gives us an urgent need for new space of about 22,000 to 50,000 ASF.***

We suggest that the simplest way to accommodate this critical growth is to move the Department of Entomology & Nematology into renovated space closer to other CAES departments (e.g. perhaps Wickson Hall and the old Viticulture & Enology building), thus consolidating that college. This department currently occupies approximately 30,000 ASF in the basement, first, and third floors of Briggs Hall, and 3,000 ASF in Storer Hall. This move would have the advantage of allowing CBS to grow within a building that is well designed to serve the research needs of our college and already houses the largest concentration of our faculty of any campus building. An additional advantage is that this move would maximize the proximity of research laboratories with collaborative potential, both for CBS and CAES.

## **Financial Considerations**

The financing of CBS growth will require funds from several sources. Our start-up packages for new regular faculty are about \$1M, an amount that is needed to maintain our ability to recruit the top scientists. As the campus creates efficient shared research infrastructure it is possible that start-up costs for new hires may be substantially reduced. But in the meantime, it is likely we will have to plan for start-up packages of at least \$1M to be competitive with peer institutions. We assemble start-ups with a combination of provost block funds, indirect cost returns from contract and grant expenditures, and departmental contributions that are mostly from ICR. In the current campus budget formula our ability to fund our share of start-ups has become limited because revenue growth is not keeping pace with the rate of increase in ongoing costs. Thus, we have developed a strategy for funding future hires that takes advantage of two new revenue sources. Our plan for growing the faculty includes reaching 10-15% LPSOEs who will bring new expertise and creativity to our teaching mission. These faculty members will facilitate expansion of new course offerings and creation of new courses that in combination increase our revenue from tuition. To realize the benefits of increased tuition dollars we have searches for LPSOEs in three CBS departments in the current year, and plan to hire five LPSOEs out of 10 total faculty in years 1-2 of this five year plan. The newly hired LPSOEs are being deployed such that the most impacted components of our college curriculum can be addressed. In addition, we plan to continue increasing our development efforts. In the past four years CBS has seen a doubling in the annual funds raised through donations to the college. We will make fund-raising a key consideration during the anticipated recruitment of a new college dean in 2015-2016.

Due to the lag expected in realizing the financial benefits of an increased LPSOE population, and in recruiting a new dean to lead college fund raising efforts, our ability to finance faculty recruitments will be most constrained in years 1 and 2 of the proposed five year hiring plan. As noted above, we have proposed a more modest rate of recruitment in these years and have emphasized LPSOEs. Clearly the college will need financial assistance from central campus to maintain our ability to attract the very best candidates such as those recruited over the past four years.

While we have existing space in the college to hire five new regular faculty, this space will be exhausted by the end of year 2 of our plan. Thus, for CBS the availability of both laboratory and office space looms as a major obstacle to the successful execution of our proposed five year plan. CBS will need substantial additional laboratory and office space to hire in years 3-5. We have a renovation plan for two large blocks of space on the first and second floors of Briggs Hall that would bring this research space up to modern standards and simultaneously make the laboratories more space efficient, allowing a net increase of four faculty laboratories. This strategy could proceed if swing space was found to temporarily house faculty, and funds were made available to support appropriate renovations.

## **Expected Outcomes of the CBS Five Year Hiring Plan**

The CBS five year hiring plan has major consequences for undergraduate education, graduate education and research at UC Davis. One of the greatest impacts will be in undergraduate education. In 2020, CBS will have about 136 to 160 faculty members, of which 18 to 26 will be LPSOEs. With the addition of the latter instruction-focused faculty members and the development of a Center for Innovative Teaching, CBS will be poised to become a leader in the development of effective, innovative teaching methods in biology. Existing faculty are well positioned to work with and learn from new colleagues with expertise in pedagogy and major strengths in instruction. The integration of this cadre of skilled and creative teachers has the potential to cause a wide range of changes to the undergraduate instruction and curriculum in our college. This will include the use of a greater diversity of classroom formats and techniques, some of which emphasize student interaction, active problem

solving, and student communication skills. We also anticipate developing increasingly effective and complete forms of assessment for our courses as there is a growing feeling that relying on student evaluations as the primary means of evaluating courses and instructors is rather limited. As the college grows we will be able to broaden our course offerings. In particular, we anticipate growth in quantitative courses across the college and the development of a human biology major.

Graduate education is an area of passionate faculty involvement and the addition of substantial numbers of new faculty members engaged in cutting-edge research will have a major impact on our ability to provide outstanding training at the graduate level. Many of the new faculty will represent new disciplinary strengths for the college. We expect that as the number of systems biologists, synthetic biologists and computational biologists grows in CBS and across the campus, new interdisciplinary graduate groups will be formed to train the next generation of students and scientists in these areas in particular.

Research in CBS will emerge with increased strength in the diverse and fundamental areas of biology found throughout the college and with new strengths in key areas that lie at the interface of some existing areas. Among the areas that will see notable growth will be *organism-environment interactions* where synergistic hires are expected in three of our departments (Evolution & Ecology; Neurobiology, Physiology & Behavior; Plant Biology) and *systems, synthetic, and computation biology* where the vast capacity of modern high-throughput genotyping and phenotyping demand large computational approaches to understanding the interactions of a multitude of system components. We expect hires in all five departments to build strengths in this rapidly emerging area. As strengths in this area continue to develop the campus can expect an increasing need for bioinformatic capabilities, high performance computing and the diverse technologies used to genotype and phenotype organisms. Finally, CBS will be a major contributor to growth in the crucial research areas represented by our centers: neuroscience, genomics, and coastal & marine sciences. Our college will continue to strengthen and develop its position as the nexus for integrative biological research at one of the largest university campuses for biological research in the world.

## **Executive Summaries – Five Year Hiring Plans**

### **CBS Departments, Centers and ORUs**

#### **Department of Evolution and Ecology**

The Department of Evolution and Ecology's mission focuses on the fundamental ecological and evolutionary processes that govern biodiversity, from scales that begin at the genome, move to the whole organism, populations, communities and up to global ecosystems. For more than 30 years, UC Davis has ranked at or near the very top of national and global research in evolution and ecology. EVE faculty members are represented prominently in campus leadership, including the current Vice Chancellor for Research (Harris Lewin) and the Vice Provost for Academic Personnel (Maureen Stanton). Three of our faculty are elected members of the National Academy of Sciences: Harris Lewin, Johanna Schmitt, and Thomas Schoener. Additionally, many EVE faculty members have been recognized across campus for excellence in teaching and service.

Our 5-year plan aims to preserve our core strengths, compromised by several recent retirements in behavior and plant evolution, as well as to develop emerging interdisciplinary areas in ecological genomics, eco-evo informatics across large spatial scales, and microbial ecology and evolution. Each of these areas firmly links EVE to research themes in other units on campus while furthering our commitment to foundational evolutionary and ecological processes. Coordinating within and outside our department, we will recruit the most innovative and diverse faculty talent, allowing EVE to retain its current stature as a top program in ecology and evolutionary biology.

#### **Department of Molecular and Cellular Biology**

The Department of Molecular and Cellular Biology is engaged in exploring the fundamental mechanisms underlying life on earth at all levels of biological organization ranging from molecules to organelles, cells, and organisms. MCB faculty are integrally involved in undergraduate education, leading three vibrant majors with increasing enrollment and broad relevance to training the future American biomedical research workforce. The department also administers and provides for the upper-division Biological Sciences core courses BIS 101-105 and plays a lead role in graduate student education and training. Finally, the Department contributes to research excellence across the campus by leading several core research facilities, including the cutting edge MCB Light Microscope Imaging Facility and the MCB Cryo Electron Microscopy Facility.

Recognizing and embracing the synergistic relationship that exists between excellence in teaching and research, we seek to hire outstanding ladder-rank faculty with the vision of (1) complementing and building on our research excellence; and (2) reflecting emerging areas of modern biology with strong societal, educational, and scientific impact. Four specific areas of growth have been identified: (1) biochemistry and structural biology, (2) cell and developmental biology, (3) genetics and genomics, (4) and photo-synthetic biology. Taking into account anticipated faculty retirements and expected 2020 student growth, MCB requires an average of two ladder faculty hires per year for the next five years. In addition, the department plans to hire a total of five Lecturer PSOE teaching faculty that will facilitate the development of our undergraduate curricula, including our MCB majors as well as the BIS 100 series, and to maintain our excellence in teaching.

## **Department of Microbiology and Molecular Genetics**

The MMG 2020 Academic Plan envisions expansion of the department of Microbiology & Molecular Genetics (MMG) from the current 18 (17.5 FTE) research faculty plus one continuing lecturer, to 25 research faculty and five teaching faculty. This expansion will empower MMG to achieve the following goals:

- (i) Facilitate implementation of the new Microbiology major curriculum that emphasizes microbiology's relationship to human biology and society, and quantitative approaches through hands on research. The curriculum is designed to efficiently absorb growth in student numbers, accelerate time-to-degree, and provide contemporary and effective programs of instruction.
- (ii) Develop an *MMG Center for Innovative Teaching in Biology (CITiB)*. Underpinning the new Microbiology major are plans for a consolidated teaching hub that will train and mentor faculty, postdocs and graduate students in novel approaches to classroom instruction.
- (iii) Build on the exemplary composition of our faculty (44% women, 28% from underrepresented groups) to reflect and embrace our increasingly diverse student body
- (iv) Develop four *Clusters of Research Excellence* that aim to bolster synergy both within faculty cohorts and between clusters and other campus units to maximize research potential and contributions to convergent transdisciplinary initiatives.
- (v) Integrate our research and teaching efforts with other departments and colleges, to build strengths in human, integrative, quantitative, systems and translational biology.

*In toto*, MMG 2020 will furnish vital expansion of the MMG research and teaching portfolio, to create critical new knowledge and solutions for the continued health and success of California and inspire new generations of students, professionals and leaders.

## **Department of Neurobiology, Physiology and Behavior**

NPB's mission is to extend knowledge of the vital functions common to all animals and convey this knowledge to students. Since 2008/9, NPB experienced a net loss of five faculty and two Lecturer SOEs, while the number of our majors has grown from 1100 to >1600; increasing our faculty:major ratio from 27:1 in 2008/9 to 53:1. NPB is the most popular CBS major and shoulders the responsibility for training a large number of students interested in pre-health and the integrative organismal biology of animals, including humans. To maintain our high quality, "new biology" centered, funded research potential, we request ten hires within NPB. We also request five LPSOE to best serve our increasing number of undergraduate majors and those from other majors to reduce our faculty:major ratio.

Five hires will be in the field of behavior, providing a core of faculty that can investigate how environmental change influences behavioral / physiological adaptation mechanisms. These hires will bridge NPB to other departments across campus. Five additional hires will investigate physiological homeostatic mechanisms, including those associated with development, injury, aging, and exercise. Researchers working in computational analysis, including big data initiatives, will be particularly attractive. Hires housed at the Center for Neuroscience will complement the current faculty. In particular, CNS faculty engaged in both computational and translational research, bringing bench science to the bedside, will provide synergy between physiologists and neuroscientists. Hires in all three areas will support a human biology major/program and provide needed expertise for our undergraduate teaching commitments.

## **Department of Plant Biology**

To meet the immediate needs and emerging challenges of research and educational activities, PLB will recruit 11 new faculty members in two broad areas: Synthetic, Systems, and Computational Biology and Organismal and Environmental Interactions. This growth is required in order for the department to remain as a world-leader in plant biology, and to help create solutions to societal problems related to food, feed, fiber, bioenergy, the environment, and health.

**Synthetic, Systems and Computational Biology:** In addition to fulfilling research activities, these new hires will enable launching of a new CBS major - Systems and Synthetic Biology (SSB). PLB will hire two faculty members with synthetic/metabolic engineering emphasis and a plant biochemist and a structural biologist to interface with synthetic biologists. Since the emergence of “Big Data” provides tremendous resources to gain insights into complex biological processes, PLB will hire one systems biologist and one computational biologist. **Organismal and Environmental Interactions:** Understanding plant responses to environmental challenges at the organismal/population level is required to engineer plants that thrive in under field conditions. PLB will hire two faculty members in the integrative plant physiology area and one faculty in the field of comparative and evolutionary genomics field. PLB will recruit a chromosomal biologist to study genome and epigenome interactions, and an ethnobotanist to explore the use of plants for medicine, food, and biomaterials. The new faculty members will establish visionary programs and interface with other CBS departments, CAES, and College of Engineering. PLB will recruit four LPSOEs to develop novel curricula for our existing teaching activities and the new SSB major.

## Genome Center

The mission of the Genome Center is to increase the international leadership of UC Davis in diverse areas of biology through providing state-of-the-art technology and training to biology researchers across campus on an at-cost, as-needed basis. This is achieved through five service cores as well as coordination and intellectual leadership of research groups focused on diverse applications of large-scale biology. It is currently comprised of nine bioinformatics and eight wet-lab, technology-driven faculty co-located in GBSF plus seven faculty located elsewhere. It acts as an incubator for new research opportunities and serves as the genomics antenna for campus. The challenge for the Genome Center and campus as a whole is how to stay current in the very rapidly changing technological and “big data” environment. Two positions are currently under recruitment: a human geneticist and a bioinformatician.

The Genome Center faculty have identified several areas that should be strengthened over the next five years in order to keep the campus at the cutting edge of biological research. These are: **human genetics**, particularly genetics of human-pathogen interactions, human population genomics, translational human genomics, and systems biomedicine; **bioinformatics**, particularly machine learning for mining genomic data, large molecular machines, and large scale data visualization for network biology; **synthetic biology**, particularly genome and pathway engineering; and **systems biology**, particularly modulation of natural products and single cell genomics. These should be recruited in partnerships with departments spread across multiple schools and colleges. Once we have completed these recruitments we will have for the most part completed the portfolio of positions originally envisaged for the Genome Center. Nine of these 25 faculty are, or will be, in CBS.

## **Center for Neuroscience**

Our short and long term goals at the Center for Neuroscience are to further advance our contributions to the rapidly expanding knowledge of the structure and function of the nervous system. In doing so we also seek to provide the basic building blocks for the level of understanding that is needed in order more effectively treat and ultimately cure common brain disorders. We pursue this knowledge across all scales, from molecular and cellular to systems, cognitive and computational perspectives as well as translational research conducted in animal models of disease mechanisms. Research at the Center for Neuroscience is increasingly integrative reflecting the application of methods that span the traditional boundaries of the field. Our approach reflects strengths in several research themes including plasticity, learning and memory, neural development, sensory systems and attention and cognitive control.

To pursue this goal we are planning to continue growth at the Center, supported by the resources of the current Director's package and by future FTE's through the 2020 Initiative and other mechanisms. Unlike the rest of CBS, the CNS has significant wet and dry lab space available to accommodate additional hiring. We propose to hire 5 new faculty at the rate of 1 per year over the next 5 years. Our hiring goals are aligned with the strategic vision of CBS. Our traditional hiring partner in the College is NPB and while their plan involves more restrained growth in neuroscience than physiology we will continue to partner with them when our interests align. We will also remain open to recruiting with other departments in the College. We plan to hire in Integrative Neuroscience, Computational Neuroscience, Cellular and Molecular & Systems Neuroscience, and Translational Neuroscience.

## **Coastal & Marine Sciences Institute**

In July of 2013, UC Davis established the Coastal and Marine Sciences Institute (CMSI) to (1) coordinate and promote the diverse research activities of the marine science & policy community at UC Davis; (2) educate future scientists and leaders who will make coastal sustainability a priority and reality; and (3) foster innovative partnerships for discovering, understanding, and communicating science for effective stewardship of ocean and coastal environments in California and beyond. Our **vision** is to be a world-leading interdisciplinary research and educational institute, focusing on the economic, ecological, and social challenges of rapidly changing and increasingly crowded coastal and ocean environments.

CMSI's progress to date has also brought into focus pressing needs in faculty hiring if we are to realize the full potential of our mission and vision. We propose 8 vital hires in coastal marine science and policy, geared towards achieving our goal of having the leading interdisciplinary educational and research program in coastal marine science and policy, as well as our new graduate group in Coastal Marine Science.

All of the 8 proposed positions have multiple potential departmental homes, and several could reside at either the main campus or Bodega Marine Laboratory (or both). We would search for the first two positions in Natural Resource Economics and Policy and Marine Microbial Ecology/Geochemistry in 2015-2016, with the remaining 6 positions to be filled in years 3-5. These would be in the areas of Coastal Sedimentary Processes, Quantitative Resource Biology, Marine Biophysical Modeling, Marine Environmental "Omics", Sustainable Mariculture, and Big Data: Genes to Seascapes.