

Discovery Science at the University of North Carolina  
at Chapel Hill (UNC-CH) in Chapel Hill, NC

The University of North Carolina at Chapel Hill has a proud history of transformational discovery science and discovery-driven research in many areas, including physics and astronomy, mathematics, chemistry, biology, and biochemistry. We aim to continue this tradition and take discovery science to the next level with the Discovery Science Fund, which includes a menu of options of funds to support affiliated individuals conducting discovery-driven research.

**PURPOSE AND FOCUS:** This fund supports high-risk, discovery-driven research for people, partnerships, and teams at all career stages as well as advanced instrumentation and infrastructure in order to pursue fundamental scientific questions.

**WHO IS ELIGIBLE:** Depending on the initiative, graduate students, postdoctoral scholars, and faculty of all ranks.

**APPLICATION AND REVIEW:** The fund will be overseen by UNC-Chapel Hill research leadership. Review infrastructures have already been set up for existing initiatives. New review structures will be designed as new initiatives are established.

**TYPE OF SUPPORT:** Many initiatives and funding opportunities exist, and others are being planned. Please contact Associate Vice Chancellor for Research, Dr. Eliana Perrin (eliana\_perrin@med.unc.edu), Associate Vice Chancellor for Corporate and Foundation Relations and Talent Management Mr. Mark Meares (mark\_meares@unc.edu), or Associate Director for Corporate and Foundation Relations Ms. Kavita Hall (kavita.kapur@unc.edu).

Basic research is critical to our future, yet funding for such scholarship is rare and dwindling. The University of North Carolina at Chapel Hill (UNC-Chapel Hill) Office of the Vice Chancellor for Research (OVCR), with full support of the Chancellor and Provost, is committed to making funding available to support such research with the following mechanisms: 1) tapping into existing research infrastructure with support of the efforts described below; 2) working in partnership with Corporate and Foundation

Relations at UNC-Chapel Hill and also major gift officers across campus to cultivate individuals for this effort—all to raise further funds at an opportune time of the launching of our university-wide capital campaign; and, 3) working with the Science Philanthropy Alliance as an active and committed partner.

UNC-Chapel Hill is already investing in its very best faculty through a competitive seed grant program administered by the Office of Research Development and open to faculty across the university. This past year the seed grants, called University Research Council (URC) grants, were redesigned to focus on the specific needs of junior faculty. Last year 45 awards were made totaling ~\$190K. The university is actively seeking to increase this amount. While these awards are not limited to discovery or basic science, many are issued for work in these areas since seed money in other fields is easier to come by.

Another investment by the UNC-Chapel Hill Office of the Vice Chancellor for Research is research funds to support faculty (rank unspecified) conducting “radically” interdisciplinary research. This new grant program, called FIRE (Fostering Interdisciplinary Research Explorations) had its pilot in 2015 and will be continued in 2016. In 2015, of 29 applications requesting \$725,000, two were awarded totaling \$50,000. The university is actively seeking to increase the funds available for this award.

UNC-Chapel Hill has also invested support in the development of a broad research program in fundamental science, called CoSMS (Institute for Cosmology, Subatomic Matter, and Symmetries). CoSMS is a collaborative of UNC-Chapel Hill (host), Duke University, North Carolina State University, the Triangle Universities Nuclear Laboratory (TUNL), and Oak Ridge National Laboratory (ORNL), as well as the UNC Morehead Planetarium and Science Center, the North Carolina Museum of Natural Sciences in Raleigh, and the Museum of Life and Sciences in Durham. The mission of CoSMS is to “unite scientists to advance the understanding of the universe using state-of-the-art technology, modern mathematical theory, and advanced high-performance computing.” CoSMS builds on a strong tradition of fundamental physics and astronomy at UNC and the associated institutions. CoSMS is engaged in active fundraising to support many interdisciplinary efforts for faculty (such as Institute Distinguished Professorships), graduate scholars (such as Institute Prize Graduate Fellowships),

postdoctoral scholars (such as Institute Prize Postdoctoral Fellowships), and infrastructure (such as colloquia and seminars, telescope access, and instrument designers). CoSMS has reached out to individual donors and is working closely with Corporate and Foundation Relations to achieve its fundraising goals.

UNC-Chapel Hill has also developed a joint research program known as the Integrative Program for Biological and Genome Sciences (iBGS). iBGS promotes curiosity-driven work about the cellular and molecular basis of disease using model organisms with a focus on non-mammalian organisms (e.g. flies, worms, frogs, zebrafish, and newly developed model organisms). It works towards a mechanistic understanding of basic biological processes, thereby generating the discoveries that fuel the translational research pipeline—particularly at the discovery end. Operating at the interface between the UNC-Chapel Hill School of Medicine (SoM) and the College of Arts and Sciences (CAS), the iBGS program is uniquely well situated to support and promote the integration of fundamental new discoveries with etiological and therapeutic efforts by clinician-scientists to combat human disease. iBGS expands the pioneering work done by the Program for Molecular Biology and Biotechnology over the last 30 years and fosters the collaborative “no walls” culture that is universally valued across the biological (CAS) and biomedical (SoM) research enterprise.

The central mission of iBGS is to support research into the mechanisms by which molecules and cells coordinate organism development and function using model systems and genomics approaches. iBGS will foster quantitative and genomic approaches for the study of development, ranging from the biochemical function of individual molecular machines performing fundamental cellular processes to the physiology of whole organisms. The strategy will be “functional genomics,” broadly defined as basic research into genome structure and function as well as the molecular mechanisms by which the RNA and proteins encoded in the genome direct cell, organ and whole organism functions.

Finally, the Department of Biology at UNC-Chapel Hill supports a world-class program in fundamental science focused on cell biology. The mission of this collaborative consortium is to generate new knowledge about how cells develop and function in tissues and organisms, using cutting-edge technology to probe and image cells, and

state-of-the-art modeling to provide a conceptual framework. The research scales from studies of individual molecules within cells to whole animal studies. Cell biology in UNC-Chapel Hill Biology has a strong tradition and world-renowned research programs that investigate basic cellular processes, and it also integrates with other cell biologists at UNC-Chapel Hill, Duke, and throughout the country. UNC-Chapel Hill Biology is engaged in providing state-of-the-art technology, and we have recently obtained NSF funding for a super-resolution imaging system to view molecules within cells, NIH funding for a high-end confocal microscope for cell imaging, and we are constructing a light-sheet system to image whole organisms. UNC-Chapel Hill Biology has reached out to individual donors and is working closely with the Arts and Sciences Foundation to achieve its fundraising goals.

For more detail about all of these specific opportunities, see below:

#### University Research Council Seed Grant

Previously our grants have been awarded at up to \$7,500 each (total funding pool approximately \$190,000 with budgetary requests for more funds for 2015-2016) to fund junior faculty with innovative ideas. However, in the future, with the discovery science fund, we hope to provide four seed grants in the basic sciences at \$50,000-75,000 each. For the URC grants, review panels derived of senior faculty representing specific disciplines review all eligible proposals and make priority ordered decisions.

Fostering Interdisciplinary Research Explorations (FIRE) Seed Grants have been offered at \$25,000 each (two awarded yearly) to fund two or more faculty of open rank (tend to attract mid- and senior-level faculty) who come from different disciplines. The Office of Research Development culls the applications down to eight. Then a research advisory group comprised of eight exceptionally talented researchers throughout the institution reviews those proposals and decides. In the future, with the Discovery Science Fund, we hope to award four proposals at \$50,000 each. For additional information about URCs or FIRE Grants, please contact Associate Vice Chancellor Eliana Perrin at [eliana\\_perrin@med.unc.edu](mailto:eliana_perrin@med.unc.edu).

CoSMS (Institute for Cosmology, Subatomic Matter, and Symmetries) is seeking support for its planned program of international workshops, distinguished visitors, and

graduate fellowships. The Institute has both internal review strategies through its interdisciplinary and multi-institutional-based faculty as well as external oversight via its scientific advisory board. For additional information about CoSMS funding opportunities, please contact Professor John Wilkerson at [jfw@unc.edu](mailto:jfw@unc.edu) or CoSMS' research assistant, Jeannie Cox at [jeanniec@unc.edu](mailto:jeanniec@unc.edu).

iGBS is seeking support for its planned program of curiosity-driven research about the cellular and molecular basis of disease using model organisms. While the program currently supports 18 tenured or tenure-track faculty, further faculty support, recruitment, and retention are needed to support continued research and joint appointments. In addition, resources are needed to support new postdoctoral fellows while they apply for independent funding, and for programmatic activities not easily supported by extramural funds, including symposia, equipment upgrades, core facilities, and seed money for new, cutting edge research projects in individual labs. Please contact Professor Bob Duronio ([durochio@med.unc.edu](mailto:durochio@med.unc.edu)) for additional information.

The Department of Biology's world class collaborative consortium on cell biology is engaged in active fundraising to support interdisciplinary efforts that include Distinguished Professorships and an Excellence Fund for faculty, both research and travel support for graduate students, and undergraduate research experiences. Please contact Distinguished Professor Vicki Bautch for more details ([bautch@unc.edu](mailto:bautch@unc.edu)).

It is through the URCs, FIRE grants, CoSMS, IGBS, and the consortium on cell biology initiatives that we have directed most of our institutional funds for discovery-driven research, but we look forward to a bright future since such research will also be a key facet of our upcoming \$4 billion dollar capital campaign.