# News from the National Institute of General Medical Sciences (NIGMS)[1]

## AN UPDATE ON NEW SCIENTIFIC INITIATIVES AND FUNDING OPPORTUNITIES AT NIGMS

About two-and-a-half years ago, this column described grant solicitations that were open at NIGMS. Recently, there have been inquiries regarding what new initiatives for research funding are available, both as Program Announcements (PAs) and as Requests for Applications (RFAs). The new scientific initiatives at NIGMS are listed below. In general, they highlight many opportunities for multidisciplinary research and reflect a trend toward more trans-NIH activities. They also demonstrate an effort to use all available mechanisms creatively, including regular research grants (R01s), the high risk-high impact pilot project mechanism (R21), supplements to ongoing active research grants, and some large, complex mechanisms (e.g., R24—an interdisciplinary research group, U01—a cooperative agreement). This column is not an exhaustive listing. Readers are directed to read the current, comprehensive listing on the NIGMS web site at http://www.nih.gov/nigms/funding/pa

NIGMS remains the "basic science institute" of NIH and is still committed to funding primarily investigator-initiated, non-disease targeted research grant applications. Investigators are always encouraged to submit their own research projects. However, there are reasons to stimulate research in particular scientific areas and to communicate NIH's interests to potential applicants in these specific fields. The initiatives are usually developed following an NIH-sponsored scientific meeting or workshop, and they are guided by the recommendations of leaders in the fields. Please consult with the listed NIGMS staff members to learn more about the announcements described below and to obtain updates on NIGMS' present and future activities in these areas.

## PHARMACOGENETIC RESEARCH NETWORK AND DATABASE, RFA GM-99-004

The purpose is to establish a series of multidisciplinary, collaborative research groups composed of investigators interested in studying how genetic variation contributes to interindividual differences in drug responses and in collecting comprehensive, integrative information about specific proteins and genes. A database group will also be established and will be responsible for the design and implementation of a pharmacogenetic database. The questions formulated and addressed by the research groups should be constructed so as to yield information that can be stored and used in a database format. The pharmacogenetic database is expected to become an information resource of maximum utility to the entire research community and should stimulate future hypothesis-driven research. The contact person at NIGMS is Rochelle M. Long, Ph.D. Telephone: (301) 594-1826; e-mail: longr@nigms.nih.gov

## RESEARCH ON TISSUE ENGINEERING, PA-99-024

The purpose is to stimulate and foster a wide range of basic and translational studies to: (1) develop optimal materials/designs for biological matrices/scaffolds; (2) better understand how such matrices/scaffolds interact with cells and their surrounding tissues; (3) develop better animal models to study tissue repair; and (4) validate and standardize the criteria for the successful repair/replacement of tissues and organs. The contact person at NIGMS is Michael E. Rogers, Ph.D. Telephone: (301) 594-3827; e-mail: rogersm@nigms.nih.gov

## MECHANISMS UNDERLYING INDIVIDUAL VARIATIONS IN DRUG RESPONSES, PA-99-016

The purpose is to stimulate research into identifying the critical candidate proteins and/or genes that play essential roles in determining individual variations in drug responses. The study of pharmacogenetic/ pharmacogenomic variation presents opportunities to a wide range of researchers, working at levels ranging from the most molecular to the most clinical, in the fields of pharmacology, genetics, genomics, medicine, and epidemiology. The contact person at NIGMS is Rochelle M. Long, Ph.D. Telephone: (301)594-1826; e-mail: longr@nigms.nih.gov

## BIOENGINEERING RESEARCH GRANTS (BRG), PAR-99-009/BIOENGINEERING RESEARCH PARTNERSHIPS (BRP), PAS-99-010

The purpose is to support basic bioengineering research whose outcomes are likely to advance health or health-related research within the mission of the NIH. A BRG is an R01-style proposal for support of basic bioengineering design-directed or hypothesis-driven research in an important medical or biological research area. A BRP is a multidisciplinary research team applying an integrative, systems approach to developing knowledge and/or methods to prevent, detect, diagnose, and treat disease and understand health and behavior, and must include bioengineering expertise in combination with basic and/or clinical investigators. BRP applications differ from BRG applications in that they will support a group of partners who work together applying an integrative, multidisciplinary, systems approach to a significant area of basic bioengineering research. The contact person at NIGMS is Warren C. Jones, Ph.D. Telephone: (301) 594-5938; e-mail: jonesw@nigms.nih.gov

## STRUCTURAL BIOLOGY OF MEMBRANE PROTEINS, PA-99-004

The purpose is to encourage basic research on the structures of membrane proteins at (or near) atomic resolution. Considerable research is on-going in the area of membrane protein structure and function, particularly with respect to sequences, topology, and the effects of mutations; however, much of this work is somewhat speculative in that the interpretations depend upon the very limited number of structures that have actually been solved by direct biophysical measurements. Despite several recent landmark solutions of membrane protein structures,

[1] The URL for the NIGMS home page is: *http://www.nih.gov/nigms/* Future topics for this column: please make your suggestions.



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there remains a significant gap between the understanding of membrane proteins and that of their soluble counterparts. The contact person at NIGMS is Peter C. Preusch, Ph.D. Telephone: (301) 594-5938; e-mail: preuschp@nigms.nih.gov

## NEW DIRECTIONS IN PAIN RESEARCH, PA-98-102

The purpose is to study mechanisms underlying the analgesic response to pain, and to advance the development of novel pain interventions, treatments and management strategies, as well as to stimulate a wide range of basic, translational and patient-oriented clinical studies. Applications are particularly encouraged to study pain throughout the lifespan from the perspectives of molecular genetics, transcriptional controls, signal transduction, including cellular/molecular mechanisms, innovative imaging technologies, plasticity, and hormonal and/or gender influences. The pain experience should be examined at all levels of analysis, from the gene, molecule, cell, tissue, and organ, to the individual, family, and community, with the ultimate goal of developing new insights into pain intervention, treatment, and management. The contact person at NIGMS is Alison E. Cole, Ph.D. Telephone: (301) 594-1826; e-mail: colea@nigms.nih.gov

## GENETIC ARCHITECTURE OF COMPLEX PHENOTYPES, PA-98-078/GENETIC BASIS OF COMPLEX BEHAVIORS, PA-98-097

The purpose is to support new studies on the architecture of complex phenotypes, including research on human and model systems as well as research using theoretical approaches. The studies are expected to expand our understanding of the roles of genetic and environmental variation and their interactions in causing phenotypic variation in populations; increase the quantity and quality of population-based data; lead to the development of mathematical and statistical tools for analyzing measured genotype data; lead to improvements in study design; and create biologically relevant models for understanding the origins, roles and implications of genetic variation in causing variation in phenotypes. In the second announcement, this concept is applied to rigorous programs of neuroscience research that will elucidate the genetic basis of complex behaviors, including memory, activity level, harm avoidance, reward dependence, emotionality, contextual fear conditioning, sensorimotor gating, drug seeking, pain perception and reactivity, and analgesic response. The contact person at NIGMS is Irene E. Eckstrand, Ph.D. Telephone: (301) 594-0943; e-mail: irene__eckstrand@nih.gov

## QUANTITATIVE APPROACHES TO THE ANALYSIS OF COMPLEX BIOLOGICAL SYSTEMS, PA-98-077

The purpose is to develop quantitative approaches to describe, analyze, and predict the behavior of complex biological systems, especially those requiring the integration of potentially large amounts of molecular, biochemical, cell biological, and physiological data. Such studies, adapted to the analysis of complex systems in humans, will ultimately have an impact on the treatment of human disorders and disease. These projects are expected to require the participation of individuals with diverse expertise and therefore to be of a collaborative and cross-disciplinary nature. Applicants are strongly encouraged to consider research areas in which systems approaches are likely to make significant contributions. These include NIGMS-supported basic studies in genetics, biochemistry, neuroscience, cell biology, and developmental biology that typically utilize non-human model systems, as well as basic studies in pharmacology, physiology, metabolic engineering, anesthesiology, inflammation, burn, and trauma. The contact person at NIGMS is James Anderson, Ph.D. Telephone: (301) 594-0943; e-mail: andersoa@nigms.nih.gov

## ZEBRAFISH AS AN ANIMAL MODEL FOR DEVELOPMENT AND DISEASE RESEARCH, PA-98-074

The purpose is to promote the zebrafish as an animal model for the study of development and disease. As a vertebrate, the zebrafish, *Danio rerio*, is more closely related to humans than are yeast, worms, or flies. The zebrafish has a number of valuable features as a model organism for the study of vertebrate development. The goals are to encourage new and innovative research and approaches using the zebrafish to identify the genes and elucidate the molecular and genetic mechanisms responsible for normal development and defective development in disease. The contact person at NIGMS is Judith H. Greenberg, Ph.D. Telephone: (301) 594-0943; e-mail: greenbej@nigms.nih.gov

## RESEARCH ON MICROBIAL BIOFILMS, PA-98-070

The purpose is to conduct studies on microbial biofilms leading to improved strategies to diagnose, prevent and treat biofilm-associated infectious diseases. Collaborative projects, both domestic and international, are encouraged that bring together investigators studying biofilms in diverse scientific disciplines, including microbiology, immunology, biochemistry, clinical medicine, pathology, bioengineering, materials science, imaging technology, and mathematical modeling. The contact person at NIGMS is Scott D. Somers, Ph.D. Telephone: (301) 594-5560; e-mail: somerss@nigms.nih.gov

In addition to the new grant initiatives highlighted above, there are several research supplement programs (SUPPLEMENTS FOR THE STUDY OF COMPLEX BIOLOGICAL SYSTEMS, PA-98-024; and SUPPLEMENTS FOR THE DETERMINATION OF HIGH RESOLUTION STRUCTURES) and personnel-oriented supplements programs (SUPPLEMENTS FOR UNDERREPRESENTED MINORITIES AND INDIVIDUALS WITH DISABILITITES, and SUPPLEMENTS TO PROMOTE REENTRY INTO BIOMEDICAL AND BEHAVIORAL RESEARCH CAREERS, PA-97-088) that are available to current recipients of NIGMS grants only. There is also an interest in courses and workshops in very specific areas (SHORT COURSES ON MATHEMATICAL AND STATISTICAL TOOLS FOR THE STUDY OF COMPLEX PHENOTYPES AND COMPLEX SYSTEMS, PA-98-083).

Some initiatives are designed specifically to provide enhanced opportunities for students, post-doctorals, and faculty at institutions with primarily underrepresented minority-enrollment (INITIATIVES FOR MINORITY STUDENTS: BRIDGES TO THE BACCALAUREATE DEGREE, RFA GM-99-001 and BRIDGES TO THE DOCTORAL DEGREE, RFA GM-99-002; INSTITUTIONAL RESEARCH AND ACADEMIC

CAREER DEVELOPMENT AWARD, PAR-98-085; MBRS RESEARCH INITIATIVE FOR SCIENTIFIC ENHANCEMENT [RISE], PAR-97-067; and MBRS SUPPORT OF CONTINUOUS RESEARCH EXCELLENCE [SCORE], PAR-97-068). There is also an initiative designed for underrepresented minority student development at majority-enrollment institutions (INITIATIVE FOR MINORITY STUDENT DEVELOPMENT, PAR-97-013).

The web site also has a link to an NIH-wide announcement of interest to the small business community (SMALL BUSINESS INNOVATION RESEARCH [SBIR] PROGRAM), as well as links to other, additional policies and topics of specific interest to some investigators (e.g., new investigators, program project grants, career development grants, and individual and institutional training grants). Readers are urged to check the NIGMS web site regularly.

Rochelle M. Long, Ph.D.[2]
*Chief, Pharmacological and Physiological Sciences (PPS) Branch*
*Division of Pharmacology, Physiology and Biological Chemistry (PPBC)*
*NIGMS, NIH*

[2] Send comments on this column to: longr@nigms.nih.gov