UC SAN DIEGO PROGRAM FOR CAREER DEVELOPMENT IN GLYCOSCIENCE

NHLBI TRAINING FELLOWSHIPS FOR PHYSICIAN-SCIENTISTS AND POST-DOCTORAL FELLOWS

This document provides a comprehensive overview of the UC San Diego Career Development Program in Glycoscience. The purpose of this program is to train the next generation of biomedical scientists for whom glycans play an integral role in their research. Selected scholars will commit to rigorous training in glycosciences over 2-3 years and carry out a research project involving glycoscience. The UC San Diego Program is coordinated by the UC San Diego Glycobiology Research and Training Center (*grtc.ucsd.edu)* and is part of a national consortium sponsored through a K12 grant from the National Heart, Lung, and Blood Institute at the National Institutes of Health. The Program includes mentored research, laboratory and didactic coursework, interaction with eminent scientists in the field, and participation in the national consortium. Candidates in the Program will be provided a stipend and opportunities to attend local and national meetings relevant to their work. Consideration will be made for increasing the number of underrepresented scholars.

TO APPLY

Scholars interested in participating in this K12 training program must have the following credentials:

- Be a citizen or permanent resident of the USA
- Possess an appropriate doctoral degree (MD, MD/PhD, or PhD) in biomedical, chemical, bioengineering or physical sciences
- Acceptance by an approved faculty mentor (see Table of Faculty Mentors)
- Strong letter of recommendation from Faculty Mentor
- For MDs who have not done PhD thesis work, evidence of motivation to pursue basic research and significant past research experience before or during medical school and residency training
- Interest and/or experience in one or more aspects of glycoscience
- Adequate space and resources provided by the Faculty Mentor (including available funding to support costs not provided by the grant)
- Long-term commitment of the Faculty Mentor to the candidate
- Commitment of the candidate and Faculty Mentor to participate in the activities of the program throughout the training period

Applicants must first contact an approved faculty mentor (see below) and be accepted into their research program. If the scholar meets the above selection criteria, the mentor and scholar should submit the following materials to *GycoK12@ucsd.edu*.

APPLICATION PACKAGE (SUBMITTED BY MENTOR AS A SINGLE PDF)

- Mentor's statement regarding candidate (1 page)
- Candidate's statement of interest in the program (1 page)
- Complete CV of candidate
- Recent NIH Biosketch of Mentor
- Current "Other Support" of Mentor

FACULTY MENTORS

Interested scholars should contact individual mentors to discuss the possibility of joining their research group.

FACULTY MENTOR	DEPARTMENT	RESEARCH INTEREST
Lars Bode lbode@ucsd.edu	Pediatrics	Human milk oligosaccharides and immunity
Michael Burkart mburkart@ucsd.edu	Chemistry & Biochemistry	Biosynthesis and glycosylation of natural products
Andrew Chisholm adchisholm	Neurobiology	Heparan sulfate and axon guidance
Adam Engler aengler@ucsd.edu	Bioengineering	Extracellular matrix and stem cell biology
Jeffrey Esko jesko@ucsd.edu	Cellular and Molecular Medicine	Glycosaminoglycan biology
Mark Fuster mfuster@ucsd.edu	Medicine	Heparan sulfate and lymphangiogenesis
Pascal Gagneux pgagneux@ucsd.edu	Pathology	Glycans in fertilization
Richard Gallo rgallo@ucsd.edu	Dermatology	Hyaluronan and skin immunity
Kamil Godula kgodula@ucsd.edu	Chemistry & Biochemistry	Glycomaterials and glycomics tool development
Philip Gordts pgordts@ucsd.edu	Medicine	Glycans in lipoprotein metabolism and diabetes
Tracy Handel thandel@ucsd.edu	Skaggs School of Pharmacy	Heparan sulfate and chemokines
Nate Lewis n4lewis@ucsd.edu	Pediatrics	Glycan bioinformatics and systems biology
Victor Nizet vnizet@ucsd.edu	Pediatrics	Glycans and infectious disease
Bernhard Palsson bpalsson@ucsd.edu	Bioengineering	Glycans and systems biology
Gentry Patrick gpatrick@ucsd.edu	Neurobiology	Glycans and synaptogenesis
Christina Sigurdson csigurdson@ucsd.edu	Pathology	Heparan sulfate and prions
Yitzhak Tor ytor@ucsd.edu	Chemistry and Biochemistry	Guanidinoglycosides and enzyme delivery
Ajit Varki a1varki@ucsd.edu	Medicine / Cellular and Molecular Medicine	Sialic acid biology and evolution
Alice Yu a1yu@ucsd.edu	Pediatrics	Glycosphingolipid-directed cancer therapy

PROGRAM ELEMENTS

SCHOLAR APPOINTMENT AND COMPENSATION

Scholars are appointed to the Program on a rolling basis. Stipends will be provided at the approved NIH postdoctoral salary rates in accordance with NIH policy, and consistent with the level of experience. Additional support for attending symposia, limited conference travel costs, and rotation to other consortium sites may also be available. The Program is designed to provide comprehensive training over a period of 2-3 years. The information below provides an overview of the training program. Each scholar's progress through the program will be assessed and adjustments made to accommodate any specific needs.

CORE PROGRAM ACTIVITIES

- Individual Development Plan
  Each scholar will formalize an Individual Development Plan (IDP) in collaboration with their Faculty Mentors to define their professional/career objective(s). The IDP will be reviewed annually to revise goals as needed and ensure the scholar's research and education plan are on track.
- Ongoing Mentored Research Project
  Under the direction of the Faculty Mentor, the Scholar will work on a research project in the Mentor's laboratory.
- Achievement of scientific literacy and competence in glycoscience
  Scholars will participate in hands-on and didactic course work. Optional courses in career development skills are also provided.
- Networking and Communication
  Scholars will have the opportunity to interact with eminent scientists in the field and to exchange information with other scholars through local meetings and national conferences.

YEAR 1 ACTIVITIES

- Active research in mentor's laboratory
- Introduction to Glycoscience (CHEM 142 / CHEM 242) (Required)
  The primary aim of Introduction to Glycoscience is to provide an overview of fundamental facts, concepts, and methods in glycoscience.
- Glycoscience Bootcamp (Required)
  Glycoscience bootcamp is a two-week summer workshop providing scholars with hands-on training in glycan analytical techniques, balancing the presentation of theory with practical demonstrations and scholar participation.
- Scientific Ethics and Survival Skills in Academia (COGSCI/NEUROSCI/PATH/SOM 241/ANTHRO271) (Required)
  Topics include research misconduct, data management, bias and conflicts of interest, animal subjects, human subjects, stem cell research, publication, peer review, collaboration, authorship, mentoring, social responsibility, asking questions, and whistle blowing, writing of papers and proposals, oral communication for educators and scientists, career advancement, and time management.

- Current Literature in Glycobiology (MED 246 / BIOM 246 / CMM 246) (Required)
  Journal Club provides a forum for informal discussion of current papers in glycobiology research.
- Glycoscience Workshop (Required)
  Glycoscience Workshop is a monthly informal meeting for program scholars and their mentors to share information about their projects and various skills related to glycoscience.
- San Diego Glycobiology Symposium
  The San Diego Glycobiology Symposium is an annual conference which brings together researchers throughout California to exchange information about the latest advances in the field. Next Generation Seminar (NextGen) is held the day before the main conference for students, fellows, and postdocs only and provides a mechanism for scholars to discuss their research in a non-intimidating environment. Scholars will participate in the symposium, will present their work during the poster session and may submit an abstract to be considered for a 10-minute presentation during NextGen.

YEAR 2 ACTIVITIES

- Advanced Glycobiology (CHEM 142 / CHEM 242) (Required)
  Advanced Glycobiology consists of Socratic style discussions of papers and relevant chapters from Essentials of Glycobiology (3rd edition) with the objective of exploring the structure, metabolism, and function of glycans in biological systems.
- Current Literature in Glycobiology (MED 246 / BIOM 246 / CMM 246) (Required)
- Glycoscience Workshop (Required)
- San Diego Glycobiology Symposium
- Career Development or Elective Course (see Optional Elements below)

YEAR 3 ACTIVITIES

- Clinical Correlations (Required)
  Clinical Correlations provides a venue for scholars to read, critique and present topics in glycoscience related to clinical medicine.
- Current Literature in Glycobiology (MED 246 / BIOM 246 / CMM 246) (Required)
- Glycoscience Workshop (Required)
- San Diego Glycobiology Symposium
- Career Development or Elective Course (see Optional Elements below)

OPTIONAL ELEMENTS

The following list is not intended to be comprehensive, rather includes elements that may be included in a particular scholar's curriculum, depending on their level, research needs, and to ensure a well-rounded scientist.

Rotation Program

UC San Diego offers a broad spectrum of training and educational opportunities in glycoscience. However, if specific training needed by a scholar is not available at UC San Diego, a rotation to one of the other consortium sites may be arranged.

Molecular Biology of the Cardiovascular System (MED238 / BE238)

This course is a broad survey of the molecular biology of the cardiovascular system, covering the development of the heart, cardiac conduction system, and vasculature, and the relevance of these to understanding and treating cardiovascular disease.

Pathogens and Host Defense: Immunology (BIOM253)

This course covers nine topics relevant to understanding contemporary immunity, primarily focused on acquired immunity.

Mouse Models for Human Disease (BIOM227 / PATH223)

This course provides an overview of the use of mouse models in biomedical research.

Practical Histopathology in Mouse Models of Human Disease: Guides to Phenotyping the Genetically Altered Mouse (MED234)

The course is designed to guide the analysis of genetically altered mice.

Professional Development for Graduate and Doctoral Students (BIOM221 / PHAR22)

This course is intended to better prepare Scholars for what lies ahead. Impetus for this course came from the Ten Rules series in Professional Development (www.ploscollections.org).

Careers in Biomedical Sciences (BIOM234 / PHAR234)