



Graduate Education in Medical Science (GEMS) Training Program

Program Phases

Program opportunities for students at all stages

The UCSF Graduate Education in Medical Sciences Training Program (GEMS) offers activities grouped into three phases intended to attract students at different stages of their Ph.D. study and different levels of commitment to education in medical sciences. These stages with activities are illustrated in the panel below.

1. Activities to enhance interest of entering and more senior graduate students in the opportunities and excitement of pursuing interactive investigations with clinical researchers.
2. Activities to increase the knowledge base and relevant skills that will enable GEMS students to pursue Ph.D. theses and careers at the interface of basic and clinical science.
3. Activities that will provide enhanced training leading to a Certificate or Masters in Translational Research with focus on a student's specific area of interest.
4. Support for MIG student Ph.D. thesis research components that involve collaborative research with a clinical scientist.

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GEMS Activities

Year	Fall	Winter	Spring	Summer
0		Inform prospective students of MIG during interview days	Invite matriculated students to apply to MIG	
Phase 1				
1				Immunology core course in late summer option for MIG. May also be taken at end of first year.
1	Staggered 1x/mo. seminars & 1x/mo. research presentations	Staggered 1x/mo. seminars & 1x/mo. research presentations	Introduction to Human Biology and Medicine mini-course. Other optional translational mini-courses	Clinical-translational rotation option for MIG students
Phase 2				
2	Join thesis lab; pairing with K12 co-mentor for MIG			Designing Clinical Research course for MIG students
2	Continued participation in MIG seminars & research presentations Discipline specific advanced course. Meetings with co-mentor			
3	Attend national meeting. Continued participation in MIG research presentations. Meetings with co-mentor.			
3	Prepare and defend clinical or translational research proposal, completing requirements for certificant or masters			
Phase 3				
3 or 4	Prepare & submit IRB, if necessary. \$support to students to do this. Initiate collaborative clinical research project			
3 or 4	Attend national meeting. Continued participation in MIG research presentations. Meetings with co-mentor.			
4 or 5	Attend national meeting. Continued participation in MIG research presentations. Meetings with co-mentor.			
4 or 5	\$support for student to pursue IRB-approved research project			

Graduate Education in Medical Science (GEMS) Training Program

Curriculum

What You Will Learn:

Introduction to Human Biology and Medicine May 10-June 4, 2010 (part of PIBS-BMS-BMI-PSPG-Bioengineering Minicourses

May 10-14: *Blood as a tissue. Intro to cellular elements: RBCs, WBCs, Platelets*

- 1. Red blood cells. CLINIC: Sick cell anemia**
- 2. White blood cells. CLINIC: Chronic granulomatous disease**
- 3. Blood Vessels.**
- 4. Hemostasis. CLINIC. Throbotic thrombocytopenic purpura**
- 5. Hematopoiesis. CLINIC: Chonic Myelocytic Leukemia**

May 17-21: *The Circulatory System*

- 6. Overview of circulatory anatomy & function.**
- 7. Cardiac action. CLINIC: Acute coronary syndromes & Myocardial infarction**
- 8. Pulmonary Circulation. CLINIC: Venous thrombosis & pulmonary embolism**
- 9, The Kidney & its role in Circulatory Volume Regulation. CLINIC: Heart failure, edema & diuretics**
- 10. Hemodialysis. Clinic. Patient demonstration in the device.**

May 24-28: *Energy Intake and Metabolism*

- 11. Overview of GI tract**
- 12. The Hepatobiliary System. CLINIC: Viral Hepatitis**
- 13. The Endocrine Pancreas. CLINIC: Diabetic ketoacidosis**
- 14. Obesity & the metabolic syndrome. CLINIC: Morbid Obesity & bariatric surgery**

May 31-June 4: *Devices and Therapeutics*

- 15. Development & testing of cardiac devices**
- 16. Case study: Angioplasty devices & intracoronary stents**
- 17. Engineering proteins & antibodies for therapeutic use.**
- 18. Student teams: Review evidence that TNF is an important mediator in RA & IBD; Review strategies for TNA inhibition; Discuss the protein engineering of the commercialized products; Evaluate drug licensing trials;**

Summarize existing licensed & off-label clinical uses; Evaluate the post-marketing data on their toxicities

UCSF Symposia in Molecular Medicine

*Rheumatoid Arthritis: Human Biology,
molecular pathogenesis & novel therapies*

A Patient with Rheumatoid Arthritis: Case Presentation

Jonathan Graf MD
Assistant Professor of Medicine, UCSF

The Immunopathogenesis of RA

John Imboden, MD
Alice Betts Endowed Chair for Research in Arthritis
Professor of Medicine, UCSF

The Genetics of RA Susceptibility

Lindsey Criswell, MD, MPH
Professor of Medicine, UCSF

New Therapeutic Targets in RA

Andrew Chan MD, PhD
Senior Vice President: Immunology and Antibody Engineering
Genentech
Associate Professor of Clinical Medicine, UCSF

Thursday, February 25 - 2:00-5:00 p.m.
Genentech Hall Auditorium



Inaugural Event sponsored by the UCSF
Graduate Education in Medical Science
(GEMS) Training Program

<http://physio.ucsf.edu/GEMS>

GEMS is a UCSF-HHMI partnership to integrate
medicine into graduate student education.



Program Leadership:

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Program Evaluation

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