



Medical School Hotline

The Role of the New Cell and Molecular Biology Graduate Program in Medical Education

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Many of us have heard the news that the complete DNA sequence of several human chromosomes is now known. Local physicians may be acquainted or have collaborated with individual scientists working on single genes or families of genes, such as those causing colon cancer, thalassemia, neurodegenerative diseases, and immune disorders. They may also know that the Howard Hughes Medical Institute supports physicians seeking training in molecular biology through MD/Ph.D. programs. But they may not be aware of the fundamental role in the Human Genome Project that was played by the Wellcome Trust, the world's largest independent medical research charity. Such support from the medical profession here and abroad is stimulating the new field of molecular medicine, and is one of the reasons why the John A. Burns School of Medicine (JABSOM) has recently instituted a new graduate program in Cell and Molecular Biology.

Medical scientists have been involved fundamentally in the process of sequencing the human genome from the beginning and continue to lead the efforts to understand complex diseases like cancer, hypertension, mental illness, and aging. In the case of the Wellcome Trust, scientists working at the Sanger Centre outside of Cambridge (UK) are part of a larger international collaboration that involves assembling a complete rough draft of the entire human genome by February 2000. This working draft will provide information about the very basis of life, health, and disease for biomedical researchers around the world, and is almost a year ahead of schedule. This example illustrates how the medical profession is adjusting to and utilizing new information to transform certain fields and discover better means of disease prevention, diagnosis and treatment.

Another example is Malaria which has reemerged as a major health problem around the world, yet the understanding of disease pathogens and efficient vectors that transmit them would be crippled without information about hypervirulent Plasmodium strains and Polymerase Chain Reaction (PCR)-based tests to diagnose specific infections. In order to face malaria in the new century, public health, epidemiology, molecular genetics, pharmacology, biochemistry, and physiology need to be taught as a common package in a multidisciplinary setting and reinforced by real-life applications. This has not been possible in a traditional graduate education program that focused on narrow sub-fields of biological science, and kept students in the classroom. From the identification of killer *E. coli* to the control of GI infections in a neonatal nursery, molecular

biology has changed the art of infectious disease diagnosis.

The new Cell and Molecular Biology Program will help to teach basic scientists in a non-traditional format along with medical students, and we hope that it will stimulate education in both groups by bringing together students with a common goal: lifelong learning and discovery. Innovations like the Problem-Based Learning (PBL) format make it easier to discuss the ethical issues surrounding informed consent as well as the molecular basis for the particular disorder underlying a certain disease. A case in point: Oncogenes and tumor suppressors were considered unusual topics in medical education ten years ago until the mapping of specific mutations allowed medical practitioners to devise better patient care protocols. JABSOM's medical students are now taught that most cases of cystic fibrosis are caused by a single common mutation in the DNA sequence of a protein forming part of an ion channel. They learn that certain populations, owing to their unique history and place of origin, have elevated risks of diabetes, hypertension, blood disorders, and kidney disease. The students are also beginning to pay as much attention to a family pedigree as they are to a thorough physical exam, but it has been difficult to incorporate some of this new knowledge into an effective medical curriculum.

The goal of the Cell and Molecular Biology program is to produce a new generation of research scientists equipped with the tools to innovate, explore, and utilize biotechnology. Available are laboratories and research projects that are particularly strong in teaching students how to use model systems, such as the humble mouse or fruit fly, as a surrogate for a human. This simplifies a number of issues, ethical and practical in nature. It allows students to tinker with a gene, a protein, even a whole organ, and study what specific changes take place if a DNA or RNA sequence coding for an important candidate gene is removed, blocked, or altered. There are researchers on the faculty particularly interested in understanding how the structures of new drugs might be designed, based on knowledge of the place where a particular molecule must cross a cell membrane or bind to a particular cellular product. It is hoped that the new program will produce researchers equipped with these necessary skills.

Finally, many people are aware of the exciting new reports of genes that fundamentally alter life span, in some cases, doubling and tripling it. At least 4 different genes are known to affect the life-span of animals now, and many researchers speculate what consequences such information might have on human life, if found and manipulated in the human species. Such speculation is closer to scientific reality than the media hype surrounding human cloning. There is need for a new generation of scientists that can deal with the complex issues of gene manipulation for life enhancement and gene therapy, as well as assisted reproduction. In a traditional academic setting, such topics would be difficult to integrate. Knowledge that the genes controlling aging in animals are a consequence of their essential function in the growth and development of the embryo can only be put into an appropriate context by teachers and mentors who respect each others specific training.

A comprehensive course on human aging must have contributions from molecular developmental biologists, psychiatrists, physiologists, nutritionists, population geneticists, and epidemiologists, and would greatly benefit by the input of an economist as well. JABSOM's faculty will now offer a new Cell and Molecular Biology program

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which will challenge the emerging demands in medical education. They recognize that new discoveries that lead to the accumulation of new facts are not enough. Those discoveries should lead to changes in the kind and quality of patient care that can be provided by a new generation of physicians.

The information age has forever altered the speed at which new knowledge in the biomedical sciences can be shared and evaluated. With our new program, we will be able to eagerly anticipate improved standards of medical care, rather than cope with or react to changes as they come about.

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DEPARTMENT OF HUMAN SERVICES NOTICE TO BIDDERS

The Department of Human Services, Vocational Rehabilitation and Services for the Blind Division, Disability Determination Branch, is soliciting proposals from internists, psychiatrists, orthopedists, physiatrists and psychologists to perform examinations on claimants who have applied for Social Security and Supplemental Security disability benefits. The examinations are to be performed at the office of the consultant. Services are needed statewide. Maximum payment for a single medical examination is \$149.76 inclusive of all taxes. Maximum payment for a personality assessment or intelligence assessment is \$149.76, inclusive of all taxes. Maximum payment for a complete psychological examination is \$299.52, inclusive of all taxes.

Applicants must be State licensed and not currently excluded, suspended, or otherwise barred from participation any Federal programs or State programs. A copy of the Request for Proposal which defines the general terms and conditions may be obtained by contacting Cynthia Lefever, Administrator, by telephone Monday-Friday between the hours of 9:00 am - 4:30 pm at (808) 944-8755 extension 224 from Oahu or at 1-800-362-1526 extension 224 from the neighbor islands.

Proposals must be received no later than 4:30 pm on March 23, 2000 at the Disability Determination Branch.

For Sale

FOR SALE.— PEDIATRIC EXAM TABLE (Train Design) and Welch Allyn Halogen Coaxial Diagnostic Set. Both nearly new. Please call 255-6678.

Practice For Sale

KALIHI.— PRACTICE FOR SALE IN KALIHI. Great location. Great potential. Reasonable price. Call Danelia at 671-3238.

Classified Notices

To place a classified notice call 536-7702.

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ALA MOANA BLDG.— PHYSICIANS WANTED to share space and support services. Interest in physical rehab. preferred. We have flexible rental arrangements starting at one half-day per week. Run your practice with no fixed overhead. Contact Dr. Speers, REHABILITATION ASSOCIATES, 955-7244.

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ANESTHESIOLOGIST.— SERVICE AVAILABLE, LOCUM TENENS, General Practice from March 1, 2000 to March 30, 2000. Anesthesiologist with 3 years US approved residency training seeks Full-Time or Part-Time position. Contact person, J Du Preez, Phone: +61 2 66581411 Australia. Call after 1600hrs Hawaiian time or e-mail: kosie@compuserve.com

Wanted

KAUAI.— SEEKING A BC/BE FAMILY PRACTICE PHYSICIAN for the Garden Island. Full-spectrum family practice including inpatient and urgent care work, OB optional. Reasonable call schedule. Kauai Medical Clinic is a 60-physician multispecialty medical group affiliated with Wilcox Health System's 185-bed community hospital. This outstanding opportunity offers excellent quality of life in a safe, beautiful, family oriented rural community. Competitive salary, benefits and relocation package. Send/fax CV to: M. Keyes-Saiki, Kauai Medical Clinic, 3-3420 Kuhio Highway, Suite B, Lihue, HI, 96766-1098. Fax (808) 246-1625. E-mail: mkeyes-saiki@wilcoxhealth.org

PRIMARY CARE PHYSICIAN.— F/T or P/T physician needed for primary care practice in Waipahu. Competitive salary. Great opportunity. Immediate opening. CALL OFELIA AT 671-3911.

PSYCHIATRIST.— Kaneohe residential Program for adolescents seeks consultant two half-days per month. Schedule, duties, compensation negotiable. Contact Administrator: RAINBOW HOUSE 239-2399.

Seeking Employment

INTERNIST.— Internist seeks opportunity in INTERNAL MEDICINE / PRIMARY CARE. Any Island. Excellent clinical skills and references. Extensive tropical medicine, critical care and geriatric experience. E-mail: brycemd@hotmail.com