doing gene expression, protein profiling and metabolite profiling," says Eric Neumann, vice president for bioinformatics, "we then analyze all the components to see how they fit together." The aim is to identify the relevant pathways that are affected in disease and to see how they change in response to treatment. According to Neumann, the company has now validated the approach in a mammalian system and will be moving to human studies.

SurroMed uses a similar strategy, yet Schulman does not describe it yet as systems biology. "Systems biology means knowing all the pathways and how they interact so that you know everything about how a cell functions, but we are a long way from it," he says. SurroMed's major focus of activity is autoimmune and cardiovascular disease, and the company is using a number of platforms, including proteomics, microarrays for gene and protein expression, and metabolome analysis, to gather information that is then integrated using a "unique set of bioinformatics tools," says Schulman. "Ultimately we want to model the entire cardiovascular system and say 'what happens when I do this or that'." It is hoped that such models could simulate the effects of a drug before testing it in humans.

Laura Bonetta, Bethesda

Nature Medicine/UCSD/Salk conference rewards physician-scientists

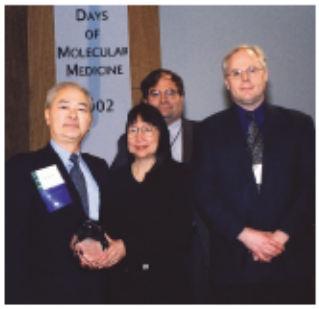
If it were not for the mentorship of Donald Seldin, physician Helen Hobbs would never have pursued a scientific career. This is what the University of Texas, Southwestern Medical Center professor told attendees at last month's *Days of Molecular Medicine*: Heart and Brain Signaling Pathways in Complex Human Diseases conference in La Jolla. The meeting was co-sponsored by the UCSD Institute of Molecular Medicine, the Salk Institute and *Nature Medicine*.

Certainly, the biomedical research community would have been poorer without Hobb's contribution to the understanding of genetic defenses against cholesterol accumulation. She was one of over 60 physician scientists speaking at the meeting, which sought to link the fields of heart and brain research (see page 305). Seldin, also at UT Southwestern, was in attendance to present this year's UCSD-Salk Mentorship award to Stuart Kornfeld and Philip Majerus of Washington University School of Medicine. Seldin was last year's award recipient.

Donald Seldin and Stuart Kornfeld

The importance of mentorship was one of the key issues raised at a special forum dedicated to discussing the drop in the number of physician-scientists in the US. While the number of MDs has risen to 707,032 over the past 15 years, only 2% of this total are physician-scientists compared with 3.9% back in 1983 (*FASEB Journal* 14, 221; 2000).

As proof of the value of dual knowledge of medicine and science, Ajit Varki, director of glycobiology research at UCSD, pointed out that at least 60% of all Nobel Prize winners in Physiology or Medicine are physicians. The great majority of these people did not receive a formal PhD but have had extensive research training, so called 'late bloomers.'



Eli Lilly scientists

Attendees saw further evidence of the contribution that physician-scientists can make to biomedical research with Kiran Musunuru's presentation. Musunuru is currently in the 5th year of an MD/PhD program at Rockefeller University, and he impressed the audience of preeminent investigators with his biochemical, structural and genetic identification of RNA ligands to the K-homology motif of Nova antigens. These antigens are implicated in the neurodegenerative disease, paraneoplastic opsoclonus-myoclonus-ataxia. The presentation marked Musunuru out as a future star in biomedicine.

One reason for the decline in the number of physician-scientists is financial pressure. Late bloomers have larger debt than their colleagues who qualify as MD/PhDs through the medical-scientist training program MSTP (medical-scientist training program). MSTP tuition is covered, and students receive stipends of around $20,000 per year. But help is at hand. Conferee Elizabeth Nabel, Scientific Director of Clinical Research at the National Heart, Lund and Blood Institute, spoke about the National Institutes of Health (NIH) loan repayment scheme that begins this year. The initiative provides repayment of up to $35,000 for 3 years of the educational debt of health professionals who agree to conduct patient-oriented research. However, only 250 such grants are available across the NIH.

By contrast, virtually no reciprocal programs operate to encourage science students who want to solve problems in human health to learn more about clinical research. One exception is the Medical Engineering Medical Physics PhD program at the Massachusetts Institute of Technology that provides medical and clinical training to 20-25 engineers and physicists each year.

Two other awards were made at the UCSD/Salk/*Nature Medicine* conference. August Watanabe, executive vice president of Science and Technology at Eli Lilly & Co received the Translational Medicine Award on behalf of his company for its development of the first targeted recombinant protein therapy for sepsis—an engineered version of Activated Protein C. The drug, called Xigris, was approved for use in the US in November 2001. Low levels of protein C are strongly associated with an increased risk of death from gram positive, gram negative, fungal, parasitic and mixed infections that characterize sepsis.


Sally Stansfield

And Sally Stansfield received the Service Award on behalf of the Bill and Melinda Gates Foundation, which has committed over $1 billion to vaccine development and public health initiatives worldwide. Last year's recipient, Christopher Reeve, sent a video message of congratulations to Stansfield.

Karen Birmingham, San Diego.