molecular oral microbiology

Tribute

Susan Kinder Haake, Professor in Periodontics and Oral Biology, UCLA, Los Angeles, a leading researcher on the role of oral bacteria in human health, and Editorial Board member for *Molecular Oral Microbiology*, died of pancreatic cancer on May 1, 2012. She was 58.

After graduating from the Tufts School of Dental Medicine in 1979, Dr. Haake went on to pursue periodontal specialty training at the University of Connecticut, and her scholarship in fastidious anaerobic bacteria contributed to her completion of an M.S. degree in Dental Science in 1985. Susan moved to the University of Texas Health Science Center in San Antonio, and earned her Ph.D. in 1993, working under Professor Stanley Holt. In her studies, she made a series of key discoveries about inter-bacterial adherence that underlie current concepts on the role *Fusobacterium nucleatum* plays in the formation of dental plaque.

In 1991, Dr. Haake joined the UCLA School of Dentistry faculty and pursued postdoctoral work with Professor Virginia Miller. After establishing her own laboratory, Dr. Haake discovered a family of unique endogenous plasmids that she developed into the first shuttle vectors, and other molecular tools, for genetic manipulation of *F. nucleatum*. Susan used these tools to inactivate a series of genes encoding large fusobacterial outer membrane proteins, in collaboration with Drs Renate Lux and Wenyuan Shi, and Chris Kaplan, a graduate student at the time. This was the first successful genetic manipulation of *F. nucleatum* and led to the characterization of proteins Aim1, Fap2 and RadD, which contribute to the ability of *F. nucleatum* to induce apoptosis. In line with Dr. Haake's longstanding interest in inter-bacterial adherence, the RadD protein was also identified as a *F. nucleatum* inter-bacterial adhesin.

Reflecting her broad perspective as both a microbiologist and periodontologist, Dr. Haake more recently collaborated with Dr. Huiying Li, at the David Geffen School of Medicine at UCLA, to study the periodontal microbiome. Complementing the NIH's five-year Human Microbiome Project, Dr. Haake's research explored whether changes in the human microbiome are associated with changes in health. Until relatively recently, periodontitis has been linked to a group of approximately 20 sub-gingival pathogens, but it is clear that many more species may contribute to the disease. Dr. Haake proposed to examine the subgingival microbiota of periodontitis before and after treatment to identify functional metagenomic signatures (DNA regulatory motifs, pathogenic elements, and functional pathways or interactions) of the microbial communities. She believed that the microbiota of chronic periodontitis must possess genes, regulatory elements, and functional pathways that contribute to the development of periodontitis, and that these would distinguish the metagenomic communities from those of a healthy individual. The identification of metagenomic signatures that indicate the development of periodontitis could lead to new strategies for the diagnosis, prevention and treatment of the disease.

A second study involved defining the microbial community and the metagenomic signatures that distinguish the subgingival microbiome associated with chronic periodontitis in type 2 diabetics from that of non-diabetics. Even though diabetics are twice as likely to suffer from periodontitis, there had not been a comprehensive analysis of the microbiome associated with this disease in diabetic patients. She hoped that the findings would address a fundamental gap in knowledge of the periodontal microbiome in diabetics with periodontitis and lead to further studies for the development of innovative clinical approaches to diagnosing, preventing and managing this disease.

Dr. Haake's numerous awards included the National Institutes of Health – National Institute of Dental Research Physician-Scientist Award for 1987-1992; the Robert B. Wolcott Award of the Omicron Kappa Upsilon Dental Honor Society for distinguished service to the dental profession in 2004; and diplomate status from the American Board of Periodontology in 2007. In recognition of her outstanding teaching and mentoring in periodontics, she received the American Academy of Periodontology's Educator Award in 2008 and 2012. She was named Chair of the Oral, Dental and Craniofacial Sciences Study Section at NIH's Center for Scientific Review and was appointed Member-At-Large of the Dentistry and Oral Health Sciences Section of the American Association for the Advancement of Science.

Susan was a long-standing editorial board member of the *Journal of Dental Research*, as well as serving on the Editorial Board of *Molecular Oral Microbiology*. Dr. Haake is survived by her husband, David Haake; children, Christine and Erik; two sisters and two brothers.

Wenyuan Shi
UCLA School of Dentistry, Los Angeles, CA, USA

Tax-deductible donations may be sent to the UCLA Foundation/Dr. Susan Kinder Haake Clinician-Scientist Fund. To make a donation or for more information, please contact: UCLA School of Dentistry, c/o Mallory Gompert, 10833 Le Conte Ave., 53-038 CHS, Box 951668, Los Angeles, CA 90095-1668, USA. Tel. 310-206-0215.