Dana Graves, DDS, DMSc

This New Professor of Periodontics and Associate Dean for Translational Research is Bridging the Gap Between the Clinic and Laboratory

By Debbie Goldberg
When Dana Graves, DDS, DMSc, Penn Dental Medicine’s new Professor of Periodontics and Associate Dean for Translational Research, was working toward his master’s degree in Oral Biology at Harvard School of Dental Medicine, he was required to participate in research projects as part of the program.

That exposure changed the course of his career. He was so taken with the work going on in the laboratory that instead of becoming a full-time practicing periodontist, as he had planned, Dr. Graves took four years to complete a doctoral program in Oral Biology, while earning a certificate in periodontology. A 26-year career in academic dentistry, at Harvard, Boston University, and the University of Medicine and Dentistry of New Jersey, followed.

Now, one of Dr. Graves’ main goals at Penn Dental Medicine is to create a similar opportunity for students training in specialty programs and, perhaps, ignite that spark of interest in research that so moved him years ago.

“That’s what we want to happen here,” Dr. Graves says. “We want to open that door for students with curiosity.”

In a wide-ranging interview two months after he joined the Penn Dental Medicine faculty in July, Dr. Graves talked earnestly about his responsibilities, goals, and vision in the newly created position. Maximizing research opportunities, building stronger collaborations within Penn Dental Medicine and with other schools at the University of Pennsylvania, and continuing to devote time to his research on diabetes-related problems are among his top priorities.

Building on the Research Enterprise
A soft-spoken man who weighs his words carefully, Dr. Graves says his arrival at the West Philadelphia campus during the summer heat was the result of it being “the right place at the right time.” He earned his DDS from Columbia University in 1980, and his DMSc in Oral Biology and Certificate in Periodontology in 1984 from Harvard University, where his interest in research was ignited.

Before coming to Penn Dental Medicine, Dr. Graves was Professor and Chair of Periodontics at the University of Medicine and Dentistry of New Jersey, charged with building the periodontal department. From 1987 to 2008, he taught at Boston University’s School of Dental Medicine, most recently as Professor of Periodontology and Oral Biology, and was an attending periodontist at BU’s Dental Health Center. Earlier in his career, he taught at the University of Texas Health Center in San Antonio and at Harvard’s School of Dental Medicine. In addition to his on-campus roles, since 2006 he has been associate editor of the Journal of Dental Research, and for the last three years has served as Chair of a National Institutes of Health Review Panel.

When Penn Dental Medicine came calling, it appealed to him because of the reputation and quality both of the dental program and the University, and the opportunity it offered him to be part of and help build upon the School’s highly regarded research enterprise. In his role as Associate Dean for Translational Research, a newly created position, he will be working closely with Dr. Bruce Shenker, Associate Dean for Research, to enhance basic research opportunities that have clinical applicability. It is a role that Dr. Graves is well-suited for, given his own commitment to research.

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Tackling the Complications of Diabetes
Dr. Graves’ main area of interest in research involves diabetes, a disease that has implications for dental care, as it can impact oral and dermal wound healing, bone repair, and lead to a host of complications, including periodontal disease. Currently, he has five ongoing research projects and several more being developed.

One of these projects is a new collaboration with Penn Dental Medicine colleagues Joseph P. Fiorellini, DMD, DMSc, Professor and Chair of the Department of Periodontics, and Keisuke Wada, DDS, PhD, DMS, Instructor of Periodontics; Kathryn Uhrich, Ph.D., Professor and Dean of Math and Physical Sciences at Rutgers University, is also collaborating on the project.

This new project, which like the others is funded by the National Institutes of Health, is studying whether the slow release of anti-inflammatory polymers can enhance bone healing in diabetics. Both normal and diabetic animals will be tested to determine whether slow-release salicylate-based polymers alleviate inflammation and thus help in bone formation, a process that often is compromised in diabetics.

Diabetes-related inflammation also has a significant impact on the periodontium by enhancing bone resorption and limiting the repair of damaged structures, explains Dr. Graves. In another project, he is using specific inhibitors to examine how the cytokine tumor necrosis factor (TNF) affects the periodontium, thus possibly leading to ways to ameliorate these impacts of diabetes.

His other ongoing research involves host bacteria interactions, investigating different mechanisms through which oral bacteria may stimulate cytokine production and gingival epithelial cells. And in development is a research project with Claire Mitchell, PhD, Associate Professor of Anatomy and Cell Biology at Penn Dental Medicine, and Sayon Roy, PhD, Professor of Medicine and Ophthalmology at Boston University, to study diabetic retinopathy, an inflammatory problem that involves issues similar to those in periodontics.

An Important Role in Dental Research and Education
Outside the laboratory, one of his main responsibilities as Associate Dean for Translationa Research “is to better integrate the basic and clinical sciences and develop programs that have a common agenda and shared resources,” Dr. Graves says. “There has been a long and rich history at this school of excellent clinical research, and one of my jobs is to promote this excellence.”

To this end, he is spearheading a new initiative to encourage master’s students in clinical departments to participate in substantive research activities with the dental school’s basic science laboratories. Students in some clinical specialties — those with two-year certificate programs, such as endodontics and orthodontics — will now receive a stipend to pursue a Master of Science in Oral Biology and spend an extra year at Penn Dental Medicine doing research, resulting in a three-year commitment in which they will earn both their specialty certificate and master’s.

“My goal is to have students work on important externally-funded research,” Dr. Graves says. “And I’m hoping if students are given the opportunity to do this, a light will turn on, and they will consider going into academic dentistry. We need Penn Dental Medicine graduates to play an important role in dental research and education.”

This initiative benefits all involved, Dr. Graves says. Students will be assigned a research mentor and participate in high-level, funded projects that will expose them to a significant research experience. The researchers will benefit from an additional influx of talented young scholars working in the labs, and the clinical departments will benefit from an increased level of scholarly activities.

And, he says, Penn Dental Medicine will benefit from the fact that more research — particularly in the clinical areas — is being done, resulting in more scholarly output and opportunities to present findings at meetings, all of which will add to the already strong reputation of the University’s dental program.

“The clinical departments are enthusiastic” about this effort, Dr. Graves says, and will be considering whether to make the added research component a requirement of their
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postdoctoral programs, as it was for him. Currently, three postdoctoral students are opting for the added year to focus on research, and Dr. Graves expects that more will come on board each year.

Forging Partnerships Across the Campus

Since coming to Penn Dental Medicine, Dr. Graves is working on another initiative to encourage closer, collaborative ties with other schools at Penn. “We want to raise the level of scholarly activities in the dental school by partnering with other schools that have unique strengths,” he says.

Discussions have been held with the schools of Nursing and Engineering and Applied Science, both of which he says are natural partners for Penn Dental Medicine, particularly in the areas of research, teaching, and shared faculty recruitment. This effort has become a high priority under Dean Denis Kinane, and Dr. Graves is welcoming the opportunity to work with his colleagues to help move this initiative forward.

“The nursing school has substantial strengths in epidemiology, behavioral research and delivery of care,” the latter especially to underserved populations, he notes. “These are all areas of great importance for dentistry.”

Likewise, the engineering program brings tremendous expertise in simulation models, development of biomaterials, and CAD/CAM (computer-aided design/computer-aided manufacturing) technology, areas that offer great promise for collaboration, says Dr. Graves, who envisions joint projects that could result in innovative products and materials being created that could be used to make new strides in the field of dentistry.

Among his other responsibilities, Dr. Graves also is involved in helping to recruit new faculty and participate in the search process for faculty and leadership positions. Currently, he is heading a new search committee to recruit a Chair for Oral and Maxillofacial Surgery.

Wearing a number of different hats in this new position — facilitating research, fostering University collaborations, recruiting faculty, and doing hands-on research — Dr. Graves readily admits that he works long hours to fit it all in, but he is excited by the opportunities. “It’s a tall order,” he says, “but I hope to make a positive impact and that these efforts lead to something tangible.”

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