

**UIC College of Dentistry Fulfills Its Historic Research Destiny:
NIDCR U24 Grant to Make College Top Oral Healthcare Research Institution**

By William S. Bike

Research has a rich history at the University of Illinois at Chicago College of Dentistry. The College is where Dr. Isaac Schour discovered growth rings in teeth; where Dr. John B. Borden, inventor of the high-speed handpiece that is the basis for modern dentistry, was trained; where Drs. Thomas K. Barber and Earl W. Renfroe did the pathbreaking research that helped create the field of preventive orthodontics; where Dr. E. Lloyd Du Brul became the greatest dental anatomist of his time; and where Dr. Allan G. Brodie Sr. set the standard for orthodontics expertise through much of the 20th century.

Building on the stellar achievements of these giants of dental research was one of new Dean Bruce Graham's top goals for the College when he arrived in 2000. In fact, even before his official start date, he traveled to Chicago to attend that year's Clinic and Research Day to announce his Vision of top-five status for the College by 2010, with the College's "centers of research excellence that are interdisciplinary and focused on innovative research areas" one of three main components of that Vision.

By August 2000, Dean Graham began College-wide "town hall" meetings to talk about how to build the College's research infrastructure. In October 2001, with other dental school deans, associate deans for research, and officials from various universities he attended a summit held at the National Institute of Dental and Craniofacial Research (NIDCR) of the National Institutes of Health (NIH). Through the work done at the College meetings and at the NIDCR summit, the possibility of the College's obtaining an R24 grant from the NIDCR began to be considered. The R24 "is a planning grant that is a precursor to a U24 grant," said Dr. Christine Wu, who at the time was a Professor of Periodontics. The U24, for which there would be heavy competition, would provide funding to implement the R24 plan.

As part of his increased commitment to research, Dr. Graham created an Associate Dean for Research post, and appointed Dr. Wu to it in October 2002. Her first job would be to spearhead the effort to seek a R24 planning grant of \$100,000—and there was not much time, as the grant application was due in April 2003.

"We had no clue," Dr. Wu frankly admitted. "Considering where our school ranked, some thought attaining the R24 may not be possible. Some people came flat out and said, 'we're never going to get it.'"

Nonetheless, "everybody, and I mean everybody, got involved—faculty, students, and staff," Dr. Wu said. "It was a very difficult task—lots and lots of work. The most important thing is we had faculty support. We all were able to work toward a common goal."

With College-wide input, Dr. Wu, who was listed as Principal Investigator (PI) wrote the planning grant as to how the College would assess its resources, personnel, and research infrastructure, and how its research focus would be improved and enhanced through the funding provided by a U24 grant.

The one-year, \$100,000 R24 planning grant was received in August 2003.

Under the grant the College could develop an institutional Infrastructure Improvement Plan to strengthen the College's research programs through the creation of a critical mass of researchers in pre-selected areas and through improvements in the research support infrastructure, including research personnel and equipment.

With two other key personnel involved in the new effort, Drs. James Drummond, Professor, Department of Restorative Dentistry, and Phil Patston, Assistant Professor, Department of Oral Medicine and Diagnostic Sciences, the College "surveyed all the predocs, postgrads, postdocs, all the research personnel and faculty," Dr. Wu said. "The Dean went through all the space at the College to see what was available and what was occupied, and negotiated with University administration for their support." Dr. Graham got that support from R. Michael Tanner, Provost, and Dr. Eric A. Gislason, Vice Chancellor for Research.

"We assessed the research interests of all the faculty and funded PIs," Dr. Wu continued. "We did a SWOT (strengths, weaknesses, opportunity, and threats) analysis, and came up with the research focus that we could use for the application for the U24 grant."

That's where Dr. Philip Marucha, Head of Periodontics and Director of Graduate Studies, came in, serving as PI for the U24.

"The NIDCR realizes there are fewer than ten dental schools that are fully research oriented, and these schools account for close to 50% of research funding," Dr. Marucha explained. "The NIDCR wanted to be able to extend research into other places, thereby extending the research capacity in oral health. Another NIDCR goal is to support the development of oral health research technology infrastructure, which is lacking in many institutions doing oral health research. The NIH wants to see more interdisciplinary research. The way the NIH, through the NIDCR, has chosen to do this is through the U24."

Dr. Marucha and College personnel came up with a plan, he noted, “that would develop research interdisciplinary research in cancer care from an oral perspective, that would allow us to focus on the cancer patient and research issues all the way from prevention, to diagnosis, to the ultimate construction and reconstruction of the patient” as the College’s research focus: a Comprehensive Cancer Center.

Oral cancer is particularly devastating, Dr. Marucha said, “more so than nearly any kind of cancer because of the functional and esthetic destruction of a patient as a result of the cancer itself and the therapy that’s rendered afterwards. Rebuilding that patient and keeping him or her healthy through the course of treatment is a major challenge.”

The SWOT analysis had shown the College’s and University’s already existing strengths in cancer biology, tissue regeneration, access to a diverse population, position in a comprehensive medical center, and support of its existing Cancer Center. The College’s weaknesses—lack of collaborations among College researchers, gaps in translational or clinical research, need for access and training in new technologies, and absence of a well-conceived and comprehensive training program (such as a College PhD program) could be helped by U24 funding.

Even before word came whether the College would get the U24 or not, the College began increasing its focus on oral cancer. It reorganized its Department of Oral Medicine and Diagnostic Sciences under new Head Dr. Joel Epstein, an specialist in cancers of the head, neck, and oral cavity and complications of cancer therapy. With strong support from UIC’s Cancer Center and Departments of Pathology and Bioengineering, it began developing links with the University of Chicago, Northwestern and Loyola Universities, and the Great Lakes Military Research Group concerning oral cancer.

The U24 application, like that of the R24, “was truly a College effort,” Dr. Wu said. “Different faculty wrote different parts. They all contributed, and I can’t emphasize enough how much we’ve got to thank them for this.” Dr. Marucha served as the PI, developed many of the new programs in the proposal, and headed planning and implementation strategies, and Dr. Wu’s office did data collection and analysis and coordination. Dr. Shannon Dawdy, Visiting Project Coordinator, helped put it all together. “Without Shannon, it wouldn’t have gone out the way it did,” Dr. Wu asserted. “She gave it her all.”

On Sept. 8, Dean Graham announced that the NIDCR had informed the College that the U24 proposal, “Transforming Research at UIC College of Dentistry,” would be funded to the tune of \$2 million over two years, plus indirect costs, to build the research infrastructure through a program entitled “Interdisciplinary Research in Cancer from an Oral Perspective” (IRCOP).

“The NIDCR role will be both funding and guidance,” Dr. Marucha explained.

The research foci of IRCOP will be epidemiology and behavioral science, tissue engineering and biomimetics, cancer biology, microbiology and immunology, pathology, and wound healing.

“Bringing individuals from all those fields together is the goal, so we can develop a program that does research in each of these areas yet links together, ultimately resulting in the treatment of patients with all these aspects in context,” Dr. Marucha said. “Let’s look at the whole patient and try to treat him or her in a more interdisciplinary fashion.”

The aims of the IRCOP program are to increase research capacity at the College by recruiting, mentoring, and training investigators; develop and strengthen collaborations in the Chicago area between the College, other colleges at UIC, and other institutions; develop opportunities for the integration of novel technologies into research programs; increase recruitment and training of research scientists; and translate research findings into treatments that can be used by practitioners to the benefit of patients, particularly those who are underserved.

“We want to create a critical mass of researchers, a mixture of junior and senior faculty for both cutting-edge research right now and to build for the future,” Dr. Marucha said. “That will give us the potential for even more research funding from various sources.”

Up to eight new research faculty may be recruited including oral pathologists, oral cancer biologists, tissue engineers, a clinical researcher, and a wound healing researcher.

“We’ll increase the productivity of current and new faculty through mentoring programs, faculty training in clinical research, and recruitment and training of new scientists at the predoctoral and postdoctoral levels,” Dr. Marucha said. “We’ll also have programs for acquiring state-of-the-art research supplies and equipment and for faculty training in new technologies and new equipment.”

Intra- and inter-institutional links will be continued and added through “seminars and symposia including technology links that will include videoconferencing and webcasting of seminars, and group meetings that will be focused in interdisciplinary topical areas,” Dr. Marucha said.

Promises that Dean Graham received from the Office of the Provost supplement the U24 grant even further. The Provost will provide \$30,000 of recurring salary support for some of the new hires for the Comprehensive Cancer Center, and start-up funds of \$1.4 million. Provost Tanner’s office also will provide research infrastructure funds that will match those recovered from indirect costs associated with the U24 of up to \$1.1 million, and similar funds to match those recovered from indirect costs associated with grants that the new hires are able to obtain.

The U24 and Provost’s funds complement the efforts that the College already has undertaken to improve its research standing. “Research funding has more than doubled compared to 2001,” Dr. Wu said, noting that the College has moved from ranking 16th in NIH funding to 14th. “Meeting with deans and administrators of other dental schools, we have received many compliments,” Dr. Wu revealed. “People know we are up-and-coming, and they think really highly of us. The reviewer of our U24 grant said a lot of good things about our school, and the NIDCR was very impressed with our proposal. We got an outstanding score.”

In the future, the College plans to apply for National Center for Research Resources/NIH funding through the Extramural Research Facilities Improvement Program for renovation of research laboratories.

“With the funding of the U24 grant, the most difficult and exciting part begins-- implementation,” says PI, Dr. Marucha. “I am really thrilled with this opportunity, with all of these new programs to put into action. We will be very busy over the next two years. Bringing together both new and established investigators in the College and on the UIC campus is a big challenge. To then link programs across the City of Chicago will be even a bigger challenge. If we accomplish these goals, we will have the premiere and also a unique program in oral cancer, and this will help all of the research programs in the College of Dentistry.”

“We are enthusiastic about the research collaborations that are being built as a result of the initiation and funding of this program, and look forward to the innovations and implementations ahead,” Dr. Graham said. “We anticipate that this program will be truly ‘transforming.’”

“To me, this is more than a dream come true,” Dr. Wu concluded. “Our future as a research institution is incredible.”