

Preparing Future Clinician-Scientists For the Dental Profession

The future of dentistry and dental specialties relies on the science and research behind the conditions that require treatment and on understanding how to maintain health. There are 65 dental schools in the United States. Nearly all of them note in their mission statement either research, evidence-based dentistry, or both, and many are structuring their curricula with interactive teaching methods to incorporate interdisciplinary, case-based, problem-solving training—a framework that prepares the student for individual and group investigation. This is particularly important in clinical scenarios that are controversial or where treatment is experimental and emerging. The role of the dental school in educating its trainees to conduct research or to evaluate the evidence and then practically apply it is paramount. While not everyone conducts basic research or large clinical trials, the appreciation for research is central to the education of all dentists. Through research, it is possible to develop clinical guidelines and mechanism-based target therapies and to determine the etiology of disease; these findings are then disseminated in the literature or lay



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press. Staying current with the biomedical literature and critically examining the evidence for treatment are skills learned in dental school, honed in practice, and applied in the day-to-day encounters with patients who seek care.

The National Institute of Dental and Craniofacial Research (NIDCR) supports research education in communities that are both extramural (outside the National Institutes of Health [NIH]) and intramural (at the NIH in Bethesda, Maryland). This is articulated in its mission statement and fourth strategic goal to “ensure that a strong research workforce is dedicated to improving dental, oral, and craniofacial health.” (1) This mission requires addressing two major cohorts: those who are being trained to do the research and those who are being trained to apply the research in their clinical practices. How is the NIDCR developing these two cohorts? On the extramural side, greater than 70 percent of NIDCR training and career development extramural funding goes to dental schools, and the launch of the National Dental Practice-Based Research Network (PBRN) in six regions across the United States has increased the number of participating

practitioners. (2) In a domino effect, this has increased the value of evidence-based practice in the eyes of the practicing community. Some examples of this include studying HPV screening for the risk of oral cancer and assessing the efficacy of a dentist-delivered smoking cessation program. Dental specialties also realize the power of engaging those at the front lines, such as the American Association of Oral and Maxillofacial Surgeons (AAOMS), which has involved its membership in previous nationwide clinical studies and now the AAOMS PBRN. The American Association of Orthodontists is also proposing research studies for consideration by the National Dental PBRN. Research at the bench is not, and should not be, exclusive of research at the chairside.

Educating Clinician-Scientists

The NIDCR intramural research program (IRP) focuses on rare conditions, but research in these conditions begins to uncover the

etiology of common problems. The application of emerging technologies in genomics, transcriptomics, oral microbiome analysis, imaging, bioinformatics, and “big data” brings to the forefront new possibilities in personalized and precision dentistry and medicine. The NIDCR Clinical Research Fellowship (intramural) does its part to train the dual-focused

clinician and translational scientist in a two- to four-year fellowship program that facilitates a research project in the rich collaborative environment of the NIH Clinical Center. (3) An example of such a clinician-scientist is Dr. Jacqueline Mays, a fellow

who studies the biology of oral chronic graft-versus-host disease (GVHD) in post-transplant cancer patients. She has taken the lead on a randomized double-blind pilot study for a potential therapy of the oral manifestations of GVHD and is examining the possible biomarkers in salivary proteins at the onset of disease. At the completion of their projects, fellows are prepared to transition to academic

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institutions around the country and world.

This emphasis on bidirectional research and the growing partnership between basic scientists and active clinicians is required to address the full spectrum of disease, from mechanisms to clinical application—and ultimately, to lead to the improvement of the health of the American population.

References

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