

The oral cavity is unique in its microbiology, connective tissue structures, and host responses. Moreover, oral diseases present unsolved scientific challenges and novel biological phenomena. The importance of understanding the oral biology of diseases, whose incidence and severity increase with age, is clearly understood within the context of current demographic trends.

A PhD in Oral Biology is offered by The Division of Oral Biology in the Department of Molecular and Cell Biology, Boston University Henry M. Goldman School of Dental Medicine (GSDM). This program is administered through the Division of Graduate Medical Sciences of Boston University School of Medicine and is part of the Program in Biomedical Sciences (PIBS).

Program Description

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THE PROGRAM:

- Recruits students with strong backgrounds in the life and basic sciences who are interested in additional advanced training in dental and medical sciences. Applicants should have a BS in a life science; DMDs and MDs or equivalent can be eligible depending on the strength of scientific training.
- Aims to educate students in modern scientific approaches to oral biology and oral disease research.
- Accommodates and trains students whose primary goal is to pursue research in oral biology as a primary professional activity.

The PhD program will train people whose goals are to pursue research in oral biology or other dental-related biological laboratory research as a primary professional activity. The PhD will typically require five years, with extensive didactic and research training. Accepted applicants are supported by scholarships and stipends. Training enables graduates to pursue academic and commercial positions, or further postdoctoral research. The outcomes for successful dentist candidates has included subsequent clinical specialty training leading to a fulfilling career in clinical practice, research, or a combination of both in academic and commercial settings in the US and elsewhere.

Research Opportunities & Topics

AMONG THE RESEARCH TOPICS EXPLORED IN ORAL BIOLOGY ARE:

- Regulation of connective tissue accumulation in mineralized and non-mineralized oral tissues
- Production of growth and chemotactic factors by normal and transformed mesenchymal and hematopoietic cells
- Connective tissue production by primary periodontal cells and effects of fibrogenic drugs and cytokines
- Mechanisms of tumor suppression
- Molecular and cellular aspects of oral cancer to develop novel therapeutic opportunities
- Regulation of genes
- Altered inflammatory cell signal transduction pathways in Juvenile Periodontitis, and control of periodontal tissue regeneration
- Genetic mouse models of inherited human oral pathologies to determine molecular mechanisms of disease
- Osteocyte biology and systemic interactions
- Sjogren's syndrome research
- Mechanisms of mitochondrial diseases
- Mechanisms of pancreatitis
- Cell stress and regulation of gene expression

In addition, research projects may include clinical components focusing on inflammation, periodontal disease, tissue fibrosis, aging, developmental defects, and oral cancer. These studies will be carried out in collaboration with the clinical faculty at Clinical Research Center, located at the Henry M. Goldman School of Dental Medicine.



Faculty PhD Mentors

Department of Molecular and Cell Biology

David Levin, PhD

Professor and Chair
Department of Molecular & Cell Biology

Ruslan Afasizhev, PhD

Professor

Inna Afasizheva, PhD

Associate Professor

Paola Divieti Pajevic, MD, PhD

Associate Professor

Maria Kukuruzinska, PhD

Professor
Associate Dean for Research

Mikos Sahin-Toth, MD, PhD

Professor

John C. Samuelson, MD, PhD

Professor

Makoto Senoo, Ph.D.

Associate Professor

Philip Trackman, PhD

Professor
Director of Graduate Programs

PHD in Oral Biology

Email trackman@bu.edu for more information