Oral Biology Ph.D. Program

Handbook for Graduate Students and Faculty

The Ohio State University

2013-2014
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INTRODUCTION TO GRADUATE STUDY IN ORAL BIOLOGY

Oral Biology has emerged as the focal point for scientific investigation and research training in Dentistry and craniofacial biology. It is defined as the realm of scientific inquiry that focuses on the structure, development and function of the tissues of the oral cavity; the interrelationships of these tissues with the other organ systems; and the materials that are used to restore them. Oral Biology is an interdisciplinary scientific pursuit that has emerged from the more traditional biomedical areas to concentrate research on problems related to the oral complex. With this in mind, the Oral Biology Doctoral Program at The Ohio State University was initiated in May of 1990.

The major focus of the Oral Biology Ph.D. program is laboratory-based education in conducting research, but it also includes a track for preparing students for a career in translational clinical oral biology research. The ability to develop a hypothesis, design a logically consistent research protocol, collect and analyze scientific data, and explain scientific findings through both written and spoken words form the key elements of the program. The program educates students to understand current and classic scientific facts and principles that, in the broadest sense, relate to the craniofacial region. The program also teaches students how to choose and study significant scientific problems using modern scientific approaches. Graduates of this program will be prepared for research and teaching careers in either a university or an industrial setting.

The ability to conduct creative, independent research is the principal degree requirement in the Oral Biology Ph.D. program. Initially, the advisor is the source of ideas, problem-solving approaches, and methodology. However, the student must demonstrate independence in research after developing the necessary skills and experience. It is the responsibility of the advisor, with the aid of the student’s Advisory Committee, to assure that the nature, scope and quality of the research is appropriate. It is the responsibility of the student to make certain that his or her data are accurate and reproducible. A graduate student must keep systematic notes that are properly dated and must preserve all data pertaining to and collected during work on a research problem. All such notes and data must be made available to the advisor. Research records must be kept at the University and are considered property of the University.

The Oral Biology doctoral program (http://www.dent.ohio-state.edu/OralBiologyPhD) is offered under the auspices of the Graduate School of The Ohio State University. The program abides by University rules and those set forth in the Graduate School Handbook (http://www.gradsch.ohio-state.edu/Depo/PDF/Handbook/Handbook.pdf)

Admission to the Department

The Graduate Studies Committee (GSC) will review the folders of prospective students beginning in Autumn semester of each year. Folders of those individuals found to be acceptable candidates for the program will be available for all program faculty to evaluate. Faculty members interested in a prospective student should notify the GSC of their willingness to accept a new student in their laboratory.
**Financial Assistance**

Graduate students in the Ph.D. program are eligible for Graduate Teaching Assistantships. These are awarded annually and are renewable, contingent on the availability of funds and satisfactory progress in the program. All GTA appointments are for 12 months but will be terminated by the GSC for poor performance, scientific misconduct, or plagiarism.

**ORAL BIOLOGY CURRICULUM**

The scope of the Oral Biology program is intentionally broad, spanning the realm from basic cell biology, to systems biology, to biomaterials. All students are expected to be well versed in the basics of cell function. As such, every student is required to successfully complete a core curriculum of 21 hours that includes the following courses:

Stats 5301 (4 Credit Hours) Intermediate Data Analysis I

Dent 8840 (2 Credit Hours) Current Issues in Biology

Pharm 7510 (2 Credit Hours) Professional and Ethical Issues in Biomedical Sciences

Dent 7920 (1 Credit Hours) Graduate Student Seminar Series

Although a minimum of 4 credit hours is required, students are expected to enroll and participate in seminars throughout the program.

While the following courses are not a part of the core curriculum, students typically earn a minimum of 6 credits from:

Dent 8901 (.5 Credit Hours) Oral Biology Laboratory Rotations. These rotations provide a useful exposure to research during the first year, but are not required.

In addition to the course listed above, students should develop in conjunction with their advisor, track-specific coursework that will enhance their depth of understanding in a specific area appropriate to their research interests. Identified tracks include neuroscience, biomaterials science, inflammation and immunity, or cell and molecular biology. Representative course offerings for each of the five Oral Biology Tracks are detailed below. In consultation with their advisor, students will select a minimum of 20 credit hours of coursework from one of the tracks outlined below. The remainder of the credit hours for completion of the Ph.D. can come from coursework or research (Dent 899). Note, students must be enrolled in Dent 8999 at the time of graduation.

**Human Pathobiology**

IBGP 7010 Biology of Human Disease I

**Neuroscience**

PSYCH 6806 Survey in Behavioral Neuroscience I

PSYCH 6807 Neuropsychopharmacology
NEUROSCIENCE 7001 Foundations of Neuroscience I
NEUROSCIENCE 7002 Foundations of Neuroscience II
NEUROSCIENCE 7050 Neurobiology of Disease
NEUROSCIENCE 7500 Neuroimmunology

**Biomaterials and Hard Tissues**

BIOMEDE 5310 Advanced Biomaterials
BIOMEDE 5353 Hard-Tissue Biomaterials

**Inflammation and Immunity**

MICRO 6010 Principles of Microbiology
MICRO 6080 Advanced Microbial Genetics
MVIMG 5000 Evolution of Emerging Viruses
MVIMG 7010 Cellular and Molecular Immunology
MVIMG 7470 Fundamentals of Muscle Biology
MVIMG 7741 Molecular Biology and Pathogenesis of Viruses
MVIMG 8040 Mass Spectrometry and Proteomics
MICROBIO 8032 Advanced Cellular Immunology
IBGP 7020 Biology of Human Disease II
IBGP 8050 Research Techniques and Resources
IBGP 7810 Animal Models of Human Disease
IBGP 7050 Bioinformatics Applied to Human Disease

**Molecular, Cell and Developmental Biology**

BIOCHEM 5615 Biochemistry and Molecular Biology III
MOLGEN 5608 Genes and Development
BIOCHEM 5701 DNA Transactions and Gene Regulation
MOLGEN 5733 Human Genetics
MOLGEN 5701 DNA Transaction and Gene Regulation
IBGP 7050 Bioinformatics Applied to Human Disease
IBGP 7810 Animal Models of Human Disease

**Clinical Research***

MOLGEN 5701 DNA Transactions and Gene Regulations
IBGP 7300 Biomedical Informatics I
IBGP 7310 Biomedical Informatics II
MICROBIO 7724 Molecular Pathogenesis
PUBHBIO 6210 Design and Analysis of Studies in the Health Sciences I
PUBHBIO 6211 Design and Analysis of Studies in the Health Sciences II
PUBHBIO 6212 Regression Methods for the Health Sciences
PUBHEPI 6410 Principles of Epidemiology

*This coursework is flexible and will vary with the research interests of the trainee. A hallmark of this track is a dual focus on human biology and epidemiology/statistical methods. The courses listed above are appropriate for a focus on clinical oral microbiology, but coursework can be developed for other clinical disciplines.

**REQUIREMENTS FOR PHD PROGRAM**

**Program-specific requirements**

The Oral Biology Ph.D. program requirements include:

1. Satisfactory completion of the Oral Biology Core curriculum.
2. Production of a NIH or NSF styled research proposal that demonstrates the student’s potential to independently develop suitable research hypotheses and specific aims based on the literature.
3. Completion of a body of original research suitable for publication in appropriate peer-reviewed journals.
4. Successful presentation of a seminar, based on the student’s original research, geared to the faculty and students of the program but open to other interested individuals within the University.

**University requirements** (Note: Section II.6.14 of the Graduate School Handbook is the best source of information about current requirements)

1. Satisfactory completion of the Candidacy Examination and submission of the Examination Report form to the Graduate School.
2. Registration for at least three credit hours during the semester when the Candidacy and Final oral Examination are taken and during the semester in which graduation is expected.
3. Submission of the Application to Graduate form to the Graduate School no later than the second Friday of the semester in which graduation is expected.
4. Completion of a minimum of 135 graduate credit hours, at least 90 of which must be completed beyond the Master of Science Degree.
5. Completion of the following residence requirements after the Master of Science Degree has been earned or after the first 45 hours of graduate credit have been completed:
   a. a minimum of 45 graduate credit hours at this university.
   b. a minimum of three out of four consecutive semesters with an enrollment of at least 10 graduate credit hours per semester at this university.
   c. a minimum of 20 graduate credit hours over a period of at least two semesters after admission of candidacy.
6. Graduate cumulative point-hour ration of at least 3.0.
7. Approval of dissertation draft by the Dissertation Committee members and submission of the Draft Approval form and the dissertation draft to the Graduate School by the published deadline for the semester of graduation.
8. Satisfactory completion of the Final Oral Examination and submission of the Final Oral Examination Report form to the Graduate School no later than Wednesday, two weeks prior to commencement.
9. Electronic submission of the approved dissertation and abstract by the published deadline for the quarter of graduation.
10. Submission of the Final Approval form and Survey of Earned Doctorates after electronic submission of and acceptance of dissertation.
11. Completion of Ph.D. requirements within five years after being admitted to candidacy.
12. Receipt of final grades in the Graduate School by the deadline published in the Master Schedule of Classes.
13. Completion of the Ph.D. requirements established by the Oral Biology Ph.D. Graduate Studies Committee.
14. Payment of doctoral hood and microfilming fees by the published deadline for the quarter of graduation.

PROGRAM RESPONSIBILITY AND ADMINISTRATION

Graduate Studies Committee

The Graduate Studies Committee (GSC) consists of five faculty members, each elected to a five-year term beginning on July 1 and ending on June 30, and one doctoral candidate student member elected by the graduate students for a term of one year. Nominations from the Oral Biology Program faculty will be solicited each spring. The ballot will be prepared by the GSC and mailed to the complete membership of the program. The individual receiving the majority of the votes will be elected to replace the senior member of the Committee. In case of a tie the GSC will select the new member by a secret ballot. An individual can be re-elected to additional terms of he or she is willing to serve and is elected by the membership.
In addition to the elected members, the GSC included two ex-officio members: Head of the Division of Oral Biology and the Director of the Comprehensive Training in Oral and Craniofacial Sciences (CTOC) Program. Ex-officio members have the same voting rights as elected members. This arrangement provides a basis for coordinating the graduate program with major sources of stipend and tuition support for its students.

The Chair of the GSC will be elected by GSC members and will organize the agenda and call meetings at appropriate intervals throughout the year.

The responsibilities of the GSC are described in Section III.2.2 of the Graduate School Handbook and include: (1) admission of new students to the program; (2) nomination of students for fellowships and Graduate Teaching Associate (GTA) appointments; (3) evaluation of student progress annually or as needed; (4) evaluation of faculty credentials for membership on the graduate faculty; and (5) overseeing appeals and grievance procedures when necessary.

Annual Review of Students

All Oral Biology students will be reviewed annually by the Graduate Studies Committee. In May of each year students will be required to submit an updated curriculum vitae, data on their academic and research performance and copies of the publications to the GSC. During the summer session the committee will meet with each student and their advisor to discuss their progress in the program and concerns about the program.

Policy and Procedures Concerning Misconduct in Research or Scholarly Activities

Graduate students and graduate faculty aspire to professional behavior that is consistent with the highest ethical and moral standards. The Graduate School at The Ohio State University expects that graduate students will demonstrate responsibility and integrity in pursuing their creative and scholarly interests. The academic enterprise is dependent upon such behavior. Graduate students are responsible for learning about appropriate standards for ethical research and scholarly conduct and for following all university policies related to ethical research and scholarly conduct. Appendix D of the Graduate School Handbook provides an overview of the Graduate Student Code of Research and Scholarly Conduct.

All Ohio State University students are subject to provisions of The Ohio State University Code of Student Conduct. Issues of professional misconduct occurring in the College of Dentistry are managed according to the protocol outlined in the College of Dentistry Code of Honor and Professional Conduct. Issues of academic misconduct are referred to the Associate Dean of Academic Affairs and Graduate Studies for appropriate action. Issues related to scholarly misconduct by graduate students are the responsibility of the Dean of the Graduate School. Guidelines for the Review and Investigation of Scholarly Misconduct by Graduate Students are available from the Graduate School.

Grievance Procedures

If a graduate student has a grievance, he or she should first discuss the problem with the appropriate faculty member, course director, program director, academic advisor, or the individual directly involved, to seek resolution of the issues. If satisfactory resolution is not feasible, the graduate student can submit a written petition to the Chair of Oral Biology Graduate Studies Committee requesting a hearing by the full
Committee. This Committee, chaired for this special situation by the Associate Dean for Academic Affairs and Graduate Studies, or by a designated Committee member if circumstances require, will obtain written descriptions of the matters under consideration form the petitioner and other principal parties. The GSC will meet as soon as possible, but no later than 30 days after receipt of the complaint, to review this written documentation and will request all appropriate individuals involved to verbally present their viewpoints. The petitioner may have an advisor present at the Committee meeting. The advisor may only counsel the student and not actively participate in the hearing, unless clarification is needed by the Committee. Each individual witness, or requested witness groups, will meet separately with the Committee. After all witnesses have been heard, the Committee will discuss all written and oral testimony and render a decision regarding the petition. The decision requires a majority vote of the Committee members present. The decision will be communicated to the petitioner in writing as soon as possible.

If the petitioner feels that the grievance has not been satisfactorily resolved by the GSC, a written petition for review of the grievance may be submitted to the Dean of the Graduate School within 5 business days. The Dean will direct the petition to the Chair of the Graduate Associate and Fellowship Committee, one of the four standing committees of the Research and Graduate Council. The Chair of the Graduate Associate and Fellowship Committee will convene a hearing in the Graduate School, and there will be written and oral testimony from the parties involved. The procedures for graduate student grievance reviews are outlined in Appendix C of the Graduate School Handbook.

Faculty Advisor

The Chair of the Graduate Studies Committee will act as the provisional advisor for each new student until the time the student chooses a permanent faculty advisor.

During the initial semester of enrollment, students should meet with faculty members in order to become acquainted with the research activities of the program faculty. In addition, students are strongly encouraged to participate in laboratory rotations as part of the Oral Biology core curriculum. The laboratory rotations will serve as an introduction to oral biology and will range from two weeks to two months. During this time the student will have an opportunity to work closely with a faculty member to organize and perform a meaningful laboratory experience. Once acquainted with the research programs of the faculty, the student should select a graduate advisor. Any faculty member with a current full-time appointment in the Oral Biology Program and holding the category P rank on the Graduate Faculty may serve as an advisor. The student-advisor relationship is established by mutual agreement between the student and the faculty member, and is formalized by written approval of the GSC.

*The faculty advisor will serve as the Chair of both the candidacy examination committee and the doctoral examination committee. The advisor will attend to all organizational matters that are required for the conduct of the examination.*

**CANDIDACY EXAMINATION**

**Timing**- Students should strive to take the candidacy examination at the earliest possible time after completion of their formal course work. Typically, this is during their 5th or 6th semester in the program.

**Examination Committee**- The advisor, in conjunction with the student, is responsible for selectin the faculty who comprise the examination committee. This committee should be formed well in advance of
the proposed examination date and presented to the GSC for their approval. The Committee should include the advisor and at least three additional faculty members. It is recommended that one faculty member should come from outside of the Oral Biology program. It is important that biological perspective, central to the focus of the program, be strongly represented on each committee.

**Examination Format** - The Candidacy Examination consists of a single examination which includes two portions, written and oral, administered under the auspices of the GSC in conjunction with the student’s Advisory Committee and the Graduate School. The student’s Advisory Committee submits questions, determines the content and conducts the examination. The content and scope of the Candidacy Examination is at the discretion of the Advisory Committee but primarily covers the student’s program track and area of research.

*The Written Component* - Development of a NIH (6 - 10 page R03/R21 style) grant proposal. Although the research proposal can provide the basis for the intended dissertation research by the candidate, the proposal itself, as part of the candidacy exam, must describe original studies not proposed by the thesis advisor. While dissertation research may overlap a thesis advisor’s research program, the research proposal submitted by the candidate must represent an original experimental plan developed by the candidate. The candidate’s ability to generate and defend a meaningful scientific plan is an essential component of the examination process.

The grant proposal should have a strong emphasis on the current literature and should be 3 aims included in the proposal. The student will need to show a strong command of the literature and scientific aims. A letter from the student’s advisory should be included that states that the student did a significant amount of the research themselves. When achievable, the student will be strongly encouraged to apply for NRSA funding.

*The Oral Component* - The oral component of the Candidacy Examination must be held within four weeks of the written portion. Prior to the oral portion, the student is given the opportunity to review the answers, comments and criticisms on the written portion of the examination. The student’s Advisory Committee plus the Graduate School representative conduct the oral examination. Questions asked during the oral portion of the Candidacy Examination may include any aspect of Oral Biology and may also refer to questions asked on the written portion of the examination. For the results of the oral portion of the examination to be considered “satisfactory”, the report of the Candidacy Examination Committee must be unanimous. If the student fails the Candidacy Examination, it can be taken a second time if the Candidacy Examination Committee so recommends. No student is permitted to take the Candidacy Examination more than twice.

**Research**

Students are expected to begin working in a laboratory at the earliest possible time, i.e., prior to completion of didactic courses. The research experience forms the core of the doctoral education process, and must lead to work that can be presented at appropriate scientific meetings and published in high quality scholarly journals.
DISSERTATION, SEMINAR AND FINAL ORAL EXAMINATION

The dissertation is a scholarly contribution to knowledge in the area of the student's specialization. For a student in the Oral Biology program, the dissertation is based on analysis and interpretation of data derived from the student’s original research. The caliber of the research is expected to be high; the research should demonstrate a creative and original approach to a specific scientific problem. Approval of the dissertation rests with the student's Advisory Committee. The format of the dissertation can follow that of a scientific publication, but it must conform to the Graduate School format requirements, as described in the publication “Guidelines for Preparing Theses, Dissertations, and D.M.A. Documents” (available on the Graduate School website).

The Oral Biology program encourages the prompt publication of research findings. The decision on which data to publish is determined jointly by the student and advisor. However, the final decision to publish and determination of authorship rest with the advisor. In situations where a category M faculty member is co-advising while serving as the primary mentor for a student, he or she should have the final decision on publication.

The student's Advisory Committee and the Graduate School representative constitute the Final Oral Examination Committee. The Final Oral Examination tests originality, independence of thought, ability to synthesize and interpret, and quality of the research presented. The examination focuses primarily, but not exclusively, on the subject matter of the dissertation.

The student provides the Advisory Committee with a draft of the dissertation. After an approved draft is submitted to the Graduate School, the advisor makes arrangements for the Final Oral Examination. Sufficient advance notice must be given to the Graduate School to allow selection of a Graduate School representative. The student provides the representative with a copy of the dissertation at least one week prior to the Final Oral Examination.

Prior to the Final Oral Examination, the student will present a research seminar to the program’s faculty, students, and any other interested individuals. The Final Oral Examination may be scheduled immediately after this seminar or delayed until a later date if agreeable to the Examination Committee. All members of the Final Oral Examination Committee must be present during the entire examination and are expected to participate fully in questioning during the course of the examination and in the discussion and decision on the result. To comply with Graduate School regulations, the Final Oral Examination is limited to a maximum duration of two hours.

Only members of the Final Oral Examination may be present for the discussion of the student's performance and the decision about the outcome. The student is considered to have completed the Final Oral Examination successfully when a unanimously affirmative vote by the Final Oral Examination Committee is given. A written appeal for review of the examination can be initiated by the student or a member of the Final Oral Examination Committee to the Executive Committee of the Council on Research and Graduate Studies.
The student is responsible for providing copies of the dissertation to all of the committee members. After the final draft of the dissertation has been accepted the student must supply one bound copy to the Graduate Studies Committee. As a matter of courtesy, the student should also provide a bound copy of the dissertation to each of the committee members.

PROGRAM FACULTY AND RESEARCH INTEREST

AGARWAL, Sudha, Ph.D. (GF-P), Section of Oral Biology. Mechanisms of actions of biomechanical signals involved in musculoskeletal tissue repair and regeneration. My research group is focused on two problems: understanding how biomechanical signals regulate inflammation in the diseased tissue and how these signals regulate tissue regeneration. We have observed that biomechanical signals are potent anti-inflammatory signals and inhibit NF-kB signaling pathway to suppress inflammation. These signals also regulate cell proliferation and differentiation by stimulating multiple signaling pathways that are involved in tissue repair and regeneration. By using a wide array of genomics and proteomics techniques researchers in my lab are exploring transcriptional and posttranscriptional regulation of proinflammatory and regenerative genes in response to biomechanical signals.

BRANTLEY, William A., Ph.D. (GF-P), Section of Restorative and Prosthetic Dentistry. Interests: Dental metallurgy; Application of materials science principles to metallic, ceramic, and polymeric dental materials; Biological properties of dental materials; Orthodontic, prosthodontic and endodontic materials.

CHEN, YiPing, PhD. (GF-P), Section of Oral Biology. The genetic control and molecular basis of vertebrate organ formation, regeneration and abnormal development.

GRIFFEN, Ann, D.D.S., M.S. (GF-P), Section of Pediatric Dentistry. Interests: Acquisition and transmission of periodontal pathogens; Molecular and population genetics of periodontal pathogens.

HERNESS, M. Scott, Ph.D. (GF-P), Section of Oral Biology. Interests: Signal transduction mechanisms utilized by mammalian taste receptor cells. Analysis includes biophysics of membrane electrical excitability, utilization of second messenger systems (such as cAMP and IP_3) by gustatory stimuli and their consequent modulation of electrical excitability, and the emerging role of neuropeptides in taste receptor cell physiology. Experiments utilize such techniques as patch-clamp recordings, in situ hybridization, immunocytochemistry, Northern blotting, and RT-PCR.

JOHNSTON, William M., Ph.D. (GF-P), Section of Restorative and Prosthetic Dentistry. Interests: Chemical, physical and biological properties of dental biomaterials; Optical properties of esthetic biomaterials and the theoretical bases for determining optical characteristics; Mathematical modeling for description of properties of biomaterials.

KUMAR, Purnima, B.D.S., M.D.S., Ph.D. (GF-P) Section of Periodontology. Interests: The bacterial community profile in periodontal health and disease; host-bacterial interactions; clinical research.
LANNUTTI, John J., Ph.D. (GF-P) Department of Materials Science and Engineering. Interests: Materials considerations during tissue engineering; osteoblast behavior at the surface of synthetic hydroxyapatite in vitro; compositional and microstructural issues in the degradation of calcium phosphates in clinically relevant configurations; thermal generation during contact between hard tissues and orthopedic tools; bone microcirculation, osteoblast production and overall viability.

LEYS, Gene, Ph.D. (GF-P), Section of Oral Biology. Interests: We use an integrated approach that utilizes molecular biology, microbiology and epidemiology to study the molecular and population genetics of periodontitis-associated bacteria.

LITSKY, Alan, M.D., Sc.D. (GF-P) Orthopedics and Biomedical Engineering. Interests: Hard-tissue biomaterials (natural and synthetic), endoprosthesis fixation, implant micromotion, fatigue of dental implants, ethical issues in biomedical research.

MALLERY, Susan R., D.D.S., Ph.D. (GF-P), Section of Oral and Maxillofacial Surgery and Pathology. Interests: Regulation of cell cycle progression; Interaction of cellular thiol redux status with mitogen responsiveness; Association of cellular calcium status with cellular proliferation and differentiation in endothelial cells; Regulation of angiogenesis and neovascularization.

MARIOTTI, Angelo, D.D.S., Ph.D. (GF-P), Section of Periodontology. Interests: effects of sex steroid hormones and growth factors on the periodontium and sex accessory tissues.


REISER, Peter J., Ph.D. (GF-P), Section of Oral Biology. Interests: Masticatory muscle growth and development; regulation of jaw muscle contractile protein expression and physiologic properties; contractile protein structure-function properties based on single cell biophysical measurements; adaptation of muscle to altered functional demands and disease states.

ROSOL, Thomas J., D.V.M., Ph.D. (GF-P), Department of Veterinary Biosciences. Interests: Endocrinology, bone biology, calcium regulation, and animal models of disease. The specific foci of current research projects include investigations of the role and regulation of parathyroid hormone-related protein in squamous cell carcinoma of the head and neck and the lactating mammary gland.

SATOSKAR, Abhay R., Ph.D. (GF-P) Department of Molecular Virology, Immunology and Medical Genetics, School of Medicine. Interests: Our laboratory is interested in understanding the immune mechanisms that determine outcome of "New world" cutaneous and visceral leishmaniasis caused by L. mexicana and L. donovani respectively. We are particularly interested in studying the role of cytokines in regulation of immune responses during these two species of Leishmania and the use of cytokine and cytokine receptor gene deficient mice has been a very powerful tool in these studies. Our long-term goal is to identify the basic mechanisms by which cytokines regulate T cell responses and host immunity to cutaneous leishmaniasis caused by L. mexicana and visceral
leishmaniasis caused by *L. donovani* and utilize this knowledge to develop a vaccine against these diseases.

SCHRICKER, Scott. Ph.D. (GF-P) Section of Restorative and Prosthetic Dentistry. Interests: Use of synthetic polymer chemistry to improve the physical and biological properties of biomaterials (especially dental materials and hard tissue biomaterials). Current projects include development of liquid crystalline dental materials and tissue engineering scaffolds.

SEGHI, Robert R., B.S., D.D.S., M.S. (GF-P), Section of Restorative and Prosthetic Dentistry. Interests: Dental materials with emphasis on ceramic and composite materials; Specific research focus involves the development and evaluation of high performance composite materials for direct and indirect restorative applications and the cellular interactions with these materials.

SHERIDAN, John, Ph.D. (GF-P), Section of Oral Biology. Interests: Regulation of anti-viral immunity; lymphokine and neuropeptide responses during *Herpes simplex*, influenza, and rotavirus infections; Interactions between the nervous and immune systems; stress-induced modulation of viral pathogenesis and immunity; *Herpes simplex* viral encephalitis; modulation of MHC antigens.


TRAVERS, Joseph B., Ph.D. (GF-P), Section of Oral Biology. Interests: Brainstem mechanisms of taste and related sensori-motor activity associated with ingestion; Acute and chronic extracellular single unit recording techniques are combined with electromyography and neuroanatomical tract tracing. Gustatory testing in clinical patient populations.

TRAVERS, Susan P., Ph.D. (GF-P), Section of Oral Biology. Interests: Neurophysiological studies of oral sensation using single-unit recording techniques; Receptive field organization of gustatory neurons; Gustatory/oral somatosensory interactions; Afferent/efferent relationships in the gustatory system using combined neurophysiological and anatomical techniques and antidromic stimulation; Behavioral studies of gustatory function.

WALTERS, John D., D.D.S., M. Med. Sc. (GF-P), Section of Periodontology. Interests: Inflammation; signaling mechanisms involved in activation of polymorphonuclear leukocytes; PMN chemotactic peptide receptor polymorphisms and their association with aggressive periodontitis; characterization of membrane transporters that move antimicrobial and anti-inflammatory agents used in periodontal therapy.
WEGHORST, Christopher M., Ph.D. (GF-P), Division of Environmental Health Sciences, School of Public Health. Interests: Molecular mechanisms of oral cancer development in humans and experimental tumor models, with an emphasis on identifying therapeutic and chemopreventive approaches aimed at specific gene targets. He currently has two translational clinical trials underway to assess the molecular effects and chemopreventive potential of black raspberries on human oral cancer development.