



School of
Dentistry



Doctoral Student Handbook

Oral Biology

Division of Oral and Systemic Health Sciences

UCLA School of Dentistry

Dr. Paul H. Krebsbach, Dean and Professor

Dr. Cun-Yu Wang, Division Chair

Dr. Igor Spigelman, Section Chair

Dr. Spigelman, PhD Program Advisor

Dr. Sotirios Tetradis, PhD/DDS Program Advisor

SELECTED OFFICES AND PHONE NUMBERS

Arthur Ashe Student Health & Wellness Center (AASHWC)	310-825-4073
Biomedical Library	
Reference questions & Circulation desk/Renewals	310-825-4904
Campus Information	
From on-campus phones	33
From off-campus phones	310-825-4321
Dashew Center for International Students & Scholars	310-825-1681
Financial Aid Office	310-206-0400
Graduate Division Student & Academic Affairs Office	310-825-3819
Graduate Student Association	310-206-8512
Housing Offices	
On-campus Housing	310-825-4271
Off-campus Housing	310-825-4491
Family Student Housing	310-398-4692
Oral Biology Graduate Office & SAO	310-825-1955
Oral Biology Master’s Degree Advisor’s Office	310-206-8834
Oral Biology PhD Degree Advisor’s Office	310-825-3190
Oral Biology DDS/PhD Program Advisor’s Office	310-825-5712
Parking Service	310-825-8299
Registrar’s Office, Enrollment and Registration	310-825-1091
Student Psychological Services	310-825-0768
Transcript Request Service	310-825-1091 (ext. 6)
UCLA Credit Union	310-477-6628
UCLA Store, Ackerman General Info	310-825-7711
UCLA Police Evening Van Service	310-825-9800
UCLA Campus Security Officer	310-794-9255

The purpose of this handbook is to acquaint you with the various administrative and programmatic policies and procedures for completing the Oral Biology Ph.D. program. Although this handbook is far from being exhaustive, we hope it will serve as a reference point during the course of your graduate studies.

REGISTRATION & ENROLLMENT IN CLASSES

Once you have received your official acceptance letter from the UCLA Graduate Division and responded as directed in that letter, you will then come to the University to get your Bruin Card. With the card, you will be able to do all the activities described below.

MyUCLA gives UCLA students, and those who have been students within the past 10 years, real-time access to their University academic records. It is accessed by logging on to <https://my.ucla.edu> using your UCLA Logon ID and password. Do not give your UCLA Logon ID and password to anyone. If you tamper with another student's enrollment or personal data, you are subject to disciplinary action, up to and including suspension.

MyUCLA is the *easiest* way to enroll in classes and to gain real-time access to academic, financial, and personal records. The site is designed with an intuitive visual interface that walks you through the different steps of the procedure you are trying to accomplish, whether you are trying to enroll in classes, check your **BAR (Billing And Receivables) account**, change your address information, view your Study List, or see your term grades. ***It is essential that you check your BAR account through MyUCLA regularly during the term and during your time at UCLA.***

Registration: Registration consists of paying the fees that are assessed to your BAR Account and enrolling in classes. You must complete both processes by the established deadlines for each quarter (see this calendar link: <http://www.registrar.ucla.edu/Calendars/Annual-Academic-Calendar>) to be officially registered and enrolled for the term. If you receive any fellowships or financial aid, they are automatically credited to your BAR account to pay registration fees and other applicable outstanding debts. Registration fees and other University charges that are assessed to your BAR Account are **due the 20th of each month**. View your BAR account through MyUCLA.

Enrollment: Enrollment in classes is completed through MyUCLA. Oral Biology Graduate Students eligible to enroll for the next term are randomly assigned one appointment time and can use MyUCLA from the beginning of the specified appointment time through midnight on Friday of the second week of classes. Students should be enrolled in courses with unit credit by the deadline to avoid the \$50 late filing of Study List fee and to avoid having to obtain instructor signatures.

Laboratory Rotations: Students are expected to participate in the research of at least two and up to three different laboratories during the first year of the program. The purpose of this is to obtain hands-on experience with the process of research and to become familiar with the projects in these laboratories. Laboratory rotations are offered as independent study on a Graded or Satisfactory/Not Satisfactory basis (OB 596). The underlying assumption is that students will engage in a research project in the lab of their choice with no obligation to continue beyond the time when the independent study ends. Evaluation will be obtained from each lab faculty.

Selection of Research Area and Research Mentor: You determine these according to your research area of interest by October 1 of your second year. You may use the *Areas of Emphasis for Doctoral Studies*, mentioned below, as a guideline for choosing your area of interest. The Oral Biology Graduate Office should be notified formally of the choice, which will then be reviewed by the graduate advisor. If you have difficulty finding a research mentor, contact the graduate advisor (email: ispigelman@dentistry.ucla.edu).

Areas of Emphasis for Doctoral Studies: The following areas of emphasis, which reflect the strength of the oral biology core faculty, have been identified for the doctoral program. Along with their PhD Mentor, each student will select one of these areas of emphasis. This area is expected to relate to the student's proposed dissertation research. Please see the Faculty Section beginning on Page 12 of this handbook.

Oral Head & Neck Cancer Research (Mo Kang, Reuben Kim, Sanjay Mallya, No-Hee Park, Cun-Yu Wang, David Wong)

Oncology of the oral cavity and its surrounding tissues and structures

Saliva Proteome and Sjögren's Syndrome Research (Shen Hu, Fang Wei, David Wong)

Cutting-edge research on the biomarkers in human saliva

Microbial pathogenesis (Honghu Liu, Renate Lux, Hung Ton-That, Nini Tran)

Focus upon the dynamics of oral infection with emphasis on bacterial and fungal pathogenesis, and biofilm formation.

Calcified tissue metabolism and developmental biology (Tara Aghaloo, Jimmy Hu, Ichiro Nishimura, Sotirios Tetradis, Kang Ting, Cun-Yu Wang)

This area includes embryogenesis of the oral-facial apparatus developmental biology of the calcified tissues of the teeth and bone, and investigations into bone enhancing factors and the regulation of bone formation.

Immunology (Anahid Jewett, Hung Ton-That)

Role of the myeloid immune system in oral mucosal and periodontal defense. Study of human neutrophil secretion and biochemistry. Identification of cytosolic and lysosomal antimicrobial and inflammatory factors such as defensins, azurocidin, elastase, cathepsin G, and myeloperoxidase. Host bacterial inter-relationships in oral disease.

Neuroscience (Sherwin Arman, Ichiro Nishimura, Igor Spigelman)

Areas of emphasis are: 1) Mechanisms of development and maintenance of inflammatory and neuropathic pain states, and 2) Clinical and pre-clinical testing of promising therapeutics for these disorders.

Pharmacology and therapeutics (Shen Hu, No-Hee Park, Christine Quinn, Ki-Hyuk Shin, Igor Spigelman)

Pharmacodynamics and pharmacokinetics of therapeutic agents in dentistry. Quantal analysis of drugs in biologic specimens. Preclinical and clinical trials of new drugs.

Nomination of a Doctoral Committee: You will confer with your mentor to choose your Doctoral Committee. You will need a minimum of four professors on your committee. Once you and your mentor have agreed on the professors to serve on your committee, it is your responsibility to contact each of them to ask them if they would be willing to serve on your committee. It is helpful if include a brief explanation of your thesis project when you ask them.

1. The Ph.D. Committee consists of a **minimum of four faculty members**, three from within your department and one from outside your department. They must be from UCLA and have attained any of the following academic ranks:
 - Professor (any rank)
 - Professor or associate professor emeritus
 - Professor-in-residence (any rank)

- Acting professor or acting associate professor
2. The three inside members from #1 must be from Dentistry and one of these three must be from Oral Biology.
 3. One (“outside”) of #1 must be from departments outside the School of Dentistry (from other biological, life or health sciences departments).
 4. Two of #1 must hold the rank of professor or associate professor (regular or in-residence series).
 5. The chair (research mentor) of the committee must hold a professorial appointment in Oral Biology or any professor emeriti (any rank in regular or in-residence series). Acting series appointment can only serve as a co-chair. If the mentor is from another department, a co-chair from Oral Biology must be appointed.
 6. Additional members (above the minimum number of four) may be nominated and, if appointed, have the same voting rights and responsibilities as the other committee members.
 7. Adjunct Professor and Adjunct Associate Professor, Professor of Clinical X, and Visiting Professor or Visiting Associate Professor may serve as additional members (above the minimum of four) and may also serve as co-chair of the committee.
 8. By petition, one of members mentioned in #1 may be a faculty member from another UC campus who holds an appropriate appointment.

The policy above does not apply during the Covid-19 pandemic, or its subsequent flare-ups, when oral qualifying examination or dissertation defense must be conducted remotely.

When the faculty members you have contacted have agreed to serve on your committee, contact the Student Affairs Officer (SAO) in the Oral Biology graduate office (mdingman@dentistry.ucla.edu) to request completion of the Doctoral Committee Nomination form. Please go to page 10 at this website: <http://www.gdnet.ucla.edu/gasaa/library/spfgs.pdf>, for more in-depth and detailed information regarding doctoral committee requirements. This publication is the *Standards & Procedures for Graduate Study at UCLA* – a publication that will be invaluable as you continue your graduate studies!

Duties and responsibilities of the doctoral committee:

1. Conducts the Oral Qualifying Examination (OQE). All members of the committee must be present at the examination. (It is the duty of the chair to see that all members of the committee are present.) Each member of the committee reports the examination as "passed" or "not passed." A student may not be Advanced to Candidacy if more than one member votes "not passed" regardless of the size of the committee. Upon majority vote of the doctoral committee, the OQE may be repeated twice.
2. Approves the subject for the dissertation and provides the guidance required for progress toward the degree.
3. Administers the Final Oral Examination (Oral Defense). The entire committee must be present, and each member must record a decision of “passed” or “not passed.” A student will not be considered to have passed the Final Oral Examination with more than one “not passed” vote regardless of the size of the committee.
4. Selects from its membership, by unanimous agreement, the certifying members who will read, approve, and certify the dissertation (optional).

In cases where less than the entire membership have been chosen as certifying members (a minimum of three), approval of the dissertation must be unanimous. If the entire committee is acting as certifying members, the dissertation is considered as approved with one negative decision.

Reconstitution of committee: When changes are unavoidable in your dissertation committee, contact the SAO in the Oral Biology graduate office (email: mdingman@dentistry.ucla.edu) with the changes. The

SAO will prepare the **Recommendation for Doctoral Committee Reconstitution** form. This form, when complete, will be submitted to the Graduate Division for review.

The Oral Qualifying Examination and Advancement to Candidacy: After completing the required core courses, students must pass a combined written and Oral Qualifying Examination (OQE) for Advancement to Candidacy (ATC). The exam is described below. This exam is presented by the end of Fall Quarter of the student's third year in graduate school. Briefly, it includes a written research proposal and its oral defense before the approved doctoral committee. In preparing for your exam, you are allowed to consult with anyone you wish other than your research supervisor. You may want to get feedback prior to your oral exam by presenting a practice session to a group of fellow students and Postdocs. However, the Oral Qualifying Examination is open **only** to the doctoral committee members and the student.

** The OQE Format:

- The topic can be related to current research.
- The written format will be an actual research proposal that follows the guidelines of the F30/F31/T32/K1/R21 grant proposal.
 - o The Research Proposal (whether or not submitted to NIH) must include the following:
 - Abstract
 - Narrative
 - Specific Aims
 - Biographical Sketch
 - Research Proposal (6 pages, single spaced in line with NIH guidelines)
 - Bibliography
 - o NO TRAINING COMPONENT is required for the OQE. This can be done by the student if the PI and the student plan to submit to NIH.
 - o Student **MUST** refer to the NIH website and make sure all guidelines (format, font, spacing, margins etc.) are being followed.

Presenting the Oral Exam: The Oral Examination is presented to the doctoral committee and generally requires two hours to complete. This includes the presentation (approx. 35 min) and allows for questions during and after from the committee. The exam will cover your proposal as well as your general scientific background. At the end of oral defense, students will give a 15-minute short presentation of the proposed thesis topic. This Oral Qualifying Examination is open only to the doctoral committee members and the student. Students may not defend their thesis topic and advance to doctoral candidacy without consent from the doctoral program advisor.

Teaching Experience: All doctoral students are expected to participate in teaching activities by assisting the faculty for one quarter. You are encouraged to seek teaching assignments in the form of teaching assistantships from other departments. You must participate fully in the planning and delivery of the course. Foreign students whose primary language is not English are required to take the UCLA Test of Oral Proficiency (Please contact the Oral Biology SAO who will set up your registration for this test). However, those foreign students that have earned a prior undergraduate degree from an institution at which English was the sole language of instruction are exempt from this requirement.

Dissertation Requirements: The dissertation is intended to demonstrate your ability to design and carry out a research project and then to analyze and present the resulting data. Results are expected to be of publishable scientific quality. Your research mentor and doctoral/certifying committee must approve the subject of the dissertation. The following is a usual process for the dissertation creation and defense.

Midstream Examination: Students are required to present the doctoral committee a midstream seminar to outline his/her research achievements before final oral defense. Although there is no particular timing

requirement for the midstream examination, we recommend that students present the midstream examinations at least six months before final defense. Students cannot perform final oral defense unless the doctoral committee passes the midstream exam.

Dissertation preparation: In consultation with your research mentor, the dissertation manuscript may be written either in a full-length form or as a manuscript edited for publication. The physical format (e.g. margins, title page, signature page, etc.) **must be** in conformity with the UCLA Graduate Division and University Archivist's guidelines, *Policies and Procedures for Thesis and Dissertation Preparation and Filing* at this website: <https://grad.ucla.edu/academics/graduate-study/thesis-and-dissertation-filing-requirements/>. The research mentor supervises the intellectual content and may specify certain aspects of style, such as footnote style and placement, and the manner in which references are cited and listed.

Showing Dissertation to Committee: Before setting up the Final Oral Examination (Oral Defense), each committee member should be given a copy of your dissertation for comments and suggestions. This should be done at least **three weeks** before the meeting takes place.

Final Oral Examination (“Final Orals” Defense): The Final Oral Examination, administered by the doctoral committee, is required of all candidates and is a defense of the dissertation. **All members of the committee must attend and vote.** A student may pass with one negative vote. Notification is sent to the Graduate Division on the *Result of the Final Oral Examination* form.

If the student fails the Final Oral Examination, then s/he will be given a second opportunity to retake the examination within six months. If they do not pass at this point, they will be given the option to withdraw or to continue their research with consent of their advisor if the doctoral committee deems that this will strengthen the subsequent defense. A second Final Oral Examination must be taken within two years of the previous exam. Failure in this second Final Oral Examination will lead to dismissal.

Note: It is your responsibility to coordinate your Oral Defense meeting with your committee members. Once the date and time of the meeting is determined, notify SAO at least two weeks before the meeting so that a room can be reserved on your behalf and so that the appropriate forms can be prepared for signatures and filing.

Filing the Final Dissertation: The final dissertation manuscript is filed ELECTRONICALLY in accordance with Graduate Division requirements. The professors will receive an email from the Graduate Division prompting them to log in to their UCLA account to “sign off” on your thesis thus confirming you have passed. Please refer to the *Regulations for Thesis and Dissertation Preparation* publication mentioned above for the specific procedures for filing. Additionally, please make an appointment with the SAO in the Oral Biology Graduate Office for a final review of all requirements and forms.

Note: All costs involved in the production of dissertation such as typing, media illustrations, copying, etc. are the student's responsibility.

ADVISING

Initially upon admission, the Doctoral Graduate Advisor advises you. Once you have identified the research area and mentor, your research mentor then advises you for the remainder of your time in the program. The research mentor will be asked to provide written assessment concerning your research progress every year. The Doctoral Graduate Advisor will continue to guide you during discussions of your overall progress in the program.

FINANCIAL SUPPORT

Subject to available funds, the OB program may be able to provide some support to doctoral students in the first year. Once a doctoral student is accepted by a mentor into his/her laboratory, there *may be* funding available to the student. However, there is no guarantee of funding at any time unless an offer is made and a contract is signed. **When selecting laboratories, you must consider the ability of mentors to provide support.**

TIME TABLE FOR “NORMAL” PROGRESS

First Year: Your main effort will be in taking the core courses, attending seminars to receive an overview of research related to oral biology, and undertaking laboratory rotations in research laboratories.

Second Year: You are expected to choose an area of emphasis and continue to take required and elective courses. You will start extended work in a laboratory, which may become the site of your final Ph.D. dissertation research. You will begin plans and preparations for your Oral Qualifying Exam and Advancement to Candidacy. If eligible, you should also consider applying for a fellowship through an Institutional training grant, an individual fellowship through National Institutes of Health, or a private foundation.

Third Year: You will devote “full time” to your dissertation research work, and attend seminars. Your mentor may request you to take additional courses to compliment the research you are doing. Sometime during the Third Year you should make plans for a Teaching Assistantship in Life Sciences and mentoring of undergraduate students.

Fourth Year: During the fourth year you will continue with research, attend seminars, prepare the doctoral dissertation, and pass the Final Oral Examination which is the defense of your dissertation before your committee and others.

Fifth, Sixth and/or Seventh Year: These years may be required if you are in an articulated DDS or Residency program, or if the nature of your research required extra time. During these years as in the Fourth Year, you will continue with research, attend seminars, prepare the doctoral dissertation, and pass the Final Oral Examination which is the defense of your dissertation before your committee and others.

DISQUALIFICATION AND APPEAL OF DISQUALIFICATION

A student may be recommended for disqualification if the student has:

- (a) Failed to maintain a grade-point average of 3.0 for two or more quarters,
- (b) Failed to satisfy specified requirements for a conditional admission,
- (c) Failed to pass the OQE at a level considered necessary for Advancement to Candidacy,
- (d) Failed to maintain satisfactory progress in research activities, or
- (e) Failed to pass Final Oral Examination.

Appeal Procedures for disqualification are available on page 18 in *Standards & Procedures for Graduate Study* available online at: <http://www.gdnet.ucla.edu/gasaa/library/spfgs.pdf>.

GRADUATE COURSES

Only Core courses (highlighted in red) and those electives offered through the School of Dentistry are listed.

Numerous elective courses are available through the Health and Life Sciences Departments.

Number in Parenthesis Indicate Units

MC&IP 252 Molecular Mechanisms of Human Diseases I (4): Preparation: prior satisfactory molecular and cell biology coursework. Fundamental concepts and methodologies in modern biology and medicine, with emphasis on systems-based research and mechanistic understanding to human diseases and therapies as they apply to neural, immune, cardiovascular, and metabolic systems. Reading, review, and discussion of primary research literature addressing fundamental concepts and methodologies in related topic areas of human biology and diseases. Emphasis on development of scientific skills in critical analysis, knowledge acquisition and self-learning, as well as effective articulation in scientific debate and exchange.

MC&IP 252 Molecular Mechanisms of Human Diseases II (4): Preparation: prior satisfactory molecular biology coursework. Requisite: course 252. Fundamental concepts and methodologies in modern biology and medicine, with emphasis on systems-based research and mechanistic understanding to human diseases and therapies as they apply to neural, cardiovascular, and metabolic systems. Includes reading, review, and discussion of primary research literature addressing fundamental concepts and methodologies in related topic areas of human biology and diseases. Emphasis on development of scientific skills in critical analysis, knowledge acquisition and self-learning, and effective articulation in scientific debate and exchange.

201A Ontogenesis (3): This course introduces students to the molecular and cellular regulators of skeletal development and homeostasis with an emphasis on osteoimmunology. Both normal and pathologic skeletal biology are discussed.

201C Advanced Oral Biology-Pathobiology (3): Advanced course on molecular basis for oral pathogenesis. Topics include cell cycle regulation, signal transduction, apoptosis, oncogene and antioncogene, HIV and HPV associated oral cancer, stem cell biology and application, and proteomics in oral biology, etc.

206 Current Topics in Oral Immunology (2): *Prerequisite: Basic immunology or OB215A.* Discussion and analysis of current research dealing with immunological issues related to oral health, including HIV, opportunistic oral infections, periodontal pathology, oral immunopathology, caries immunology, endodontic immunology, etc.

208 Genomics & Proteomics in Oral Biology Research (2): This course introduces the fundamentals and technical aspects of genomics and proteomics and related applications. Special topics: transcription/translation, qPCR, DNA microarray, DNA sequencing, siRNA, microRNA, protein microarray, mass spectrometry, 2-D gel electrophoresis.

209 Scientific Ethics (2): The nature of science as a human endeavor, ways of understanding nature and the definition of truth, ethical principles, objectivity in research, responsible performance and reporting of research, authorship, ethical training practices, and available institutional support in cases of ethical dilemmas.

212 Proseminar: Oral Biology Research (2): Introductory course for M.S. students. Guest seminars on topics of research in oral biology (pain pathways, evidence-based dentistry, public health, ethics, stem cells and cell cycle, oral cancer, inflammatory processes and signaling, immunology bone biology, salivary diagnostics, and microbiology), followed by discussions led by course chairs.

215A Fundamentals of Immunology (2): Basic cellular and molecular mechanisms involved in responses mediated by immune effectors, with emphasis on immunopathology involved in autoimmunity, cancer, and immunodeficiency syndromes.

- 215B Current Advanced Research Topics in Immunology (2):** Overview of rapidly changing discoveries in very important field of immunology. Directed and student led discussions of current cutting-edge research developments in immunology.
- 220 Integrative Biology and Biomaterials Science in Relation to Dentistry (2):** This course gives an introduction on integrative biology and biomaterials science by bringing together a diversity of disciplines that complement one another to unravel the complexity of biology in biomaterials in relation to dentistry. This interdisciplinary course is the integration of bioengineering, materials sciences, cell biology and dentistry. The students will understand the fundamentals of materials science in relation to dentistry, stem cell biology, and the knowledge necessary to participate in dental and biomedical research, innovation, and product development. [Pending approval]
- 221 Advanced Dental Materials (2):** The goal of this course is to prepare individuals for academic and research careers in dental materials science or the broader area of biomaterials relevant to clinical dental practice. At the end of each course it is expected that the students gain understanding of the fundamentals of dental materials and the knowledge necessary to participate in research and product development. This course also offers an introduction to materials used in dentistry including polymers, metals, and ceramics providing up-to-date information on dental materials currently used in clinical dentistry. [Pending approval]
- 226 Craniofacial Growth and Development (2):** *Restricted to OB/DDS Graduate Students & Dental Residents. Preparation: strong background in histology and embryology.* Students acquire, from scientific literature discussed in lecture/seminar format, advanced knowledge of relevant aspects of human biology as they apply to classic and current concepts of principles governing growth and development of craniofacial region. Students required to present seminars on assigned topics that aid their understanding and analysis of course content that has application to their specific and professional fields.
- 227 Dental Embryology and Histology (2):** *Restricted to OB Grad Students & Residents.* This course introduces students to the molecular regulators of tooth and jaw development and the histological features of normal and abnormal dentition.
- 229A Culture, Ethnicity and Health: Implications for Oral Biology and Medicine (2):** This course draws upon sociocultural, biological and linguistic anthropology to understand factors that influence health and wellbeing, the experience and distribution of illness, the prevention and treatment of sickness, healing processes, social relations of therapy management and the cultural importance and utilization of pluralistic medical systems. Interdisciplinary in its orientation, the course draws on theory, perspectives and methods from clinical medicine, public health, epidemiology, demography and the social sciences.
- 229B Anthropological Perspectives on Global Health: Implications for Oral Biology and Medicine (2):** This course will take on the question of what factors determine health, illness, and disease in global context, including the political ecology of infectious diseases; child health issues; women's health and reproductive health; the global trade in legal and illegal drugs; demography and the health transition; structural adjustment, problems associated with the globalization of the pharmaceutical industry; antibiotic resistance; globalization and health equity.
- 234 Seminar: Developmental Neuroendocrineimmunology (2):** *Same as Neurobiology M234.* Designed for graduate students. Psychological and physiological processes intertwine, and one important aspect of psychoneuroimmunological research is characterization of mechanisms that

underlie these interactions. Examination of current literature on neuroimmune interaction from a developmental perspective.

- M256 Interdisciplinary Response to Infectious Disease Emergencies: Dentistry Perspective (4):** Designed to instill in professional students ideas of common emergency health problems and coordinated response, with specific attention to bioterrorism. Examination of tools to help students prevent, detect, and intervene in infectious disease emergencies. Interdisciplinary sessions also attended by students in Schools of Medicine, Nursing, and Public Health during weeks two through five.
- 260A,B,C Oral Biology Seminar (2):** Research seminar to discuss faculty and student research in oral biology and related disciplines. Discussion of basic sciences related to oral biology, involving participants in important areas of investigation.
- 273 Research in Clinical Immunology and Lymphology (2):** Forum for discussion of cutting-edge topics in immunology and lymphology from clinical perspective. Emphasis on immune surveillance and lymphatic drainage of oral pathologies associated with AIDS and other diseases.
- 275 Molecular and Cell Biology for Oral Biology Graduate Students (3):** Advanced course on prokaryotic and eukaryotic molecular and cell biology, with emphasis on applications in dental research.
- 596 Directed Individual Study or Research (2 to 8):** Sign up according to your mentor.
- 597 Preparation for PhD Qualifying Examinations (4 to 8):** Sign up according to your mentor.
- 598 Thesis Research and Preparation (2 to 8):** Sign up according to your mentor.

GRADUATE FACULTY AND THEIR RESEARCH

Tara Aghaloo, D.D.S., M.D., Ph.D. (taghaloo@dentistry.ucla.edu) - Dr. Tara Aghaloo is the Assistant Dean of Clinical Research and Professor in the Section of Oral and Maxillofacial Surgery in the Division of Diagnostic and Surgical Sciences at the UCLA School of Dentistry. She is also the Director of the Clinical Research Center, where she works closely with the UCLA Clinical Translational Science Institute.

Sherwin Arman D.M.D., M.P.H. (sarman@dentistry.ucla.edu) - Our research interests are in the area of temporomandibular dysfunction, neuropathic pain, obstructive sleep apnea, primary headache, and painful oral lesions.

Kathryn A. Atchison, D.D.S., M.P.H. (katchison@conet.ucla.edu) – Our research pertains to health services, with major focus on health literacy, oral health quality of life, and studies on the cost and quality of health care.

Paulo M. Camargo, D.D.S., M.S., M.B.A. (pcamargo@dentistry.ucla.edu) - Our research program focuses on: (a) elucidating the mechanisms involved in bone loss around dental implants and developing strategies to prevent and treat peri-implantitis. Working on a murine model, we hope to understand the role played by various pro-inflammatory genes and cytokines in bone resorption around dental implant fixtures and to develop novel approaches to modulate the immune response; and (b) examining saliva as vehicle to diagnose and predict the onset and progression of periodontal and peri-implant diseases. Utilizing proteomic- and transcriptomic-based micro array techniques, human saliva is being analyzed for the presence of individual and/or groups of molecules that may alert patients about the need to seek dental care and also aid the clinician in customize preventive and corrective treatment for individuals at risk for periodontal and peri-implant attachment and bone loss.

Yvonne Hernandez-Kapila, D.D.S., Ph.D. (ykapila@dentistry.ucla.edu) – Our research is centered around the cell and molecular biology mechanisms that govern periodontal disease pathogenesis and oral cancer carcinogenesis using *in vitro* and *in vivo* models, and human clinical studies.

Jimmy K. Hu, Ph.D. (jhu@dentistry.ucla.edu) Our research aims to extract principal mechanisms of tissue morphogenesis and stem cell regulation in order to design and develop strategies for regenerative medicine.

Shen Hu, Ph.D. (shu@dentistry.ucla.edu) – My lab research is focused on proteomics and metabolomics of head/neck cancer, pancreatic cancer, and Sjogren's syndrome. Particularly we are interested in using mass spectrometry and protein array technology to study early malignant transformation and tumor metastasis and to discover target proteins for therapeutic/diagnostic applications. We are also interested in single cell proteomics and immunoproteasome activation in Sjogren's syndrome.

Anahid Jewett, Ph.D., M.P.H. (ajewett@dentistry.ucla.edu) – Our research interest lies in immunobiology of Oral cancers and Allergic reactions to dental resins, immunobiology of natural killer cells in health and disease. Mechanisms of Oral mucosal immunopathologies as they relate to cancer, allergic and bacterial diseases.

Mo K. Kang, D.D.S., Ph.D. (mkang@dentistry.ucla.edu) – Our research is centered on elucidating the mechanisms of cellular aging and immortalization in normal human oral keratinocytes (NHOK). The laboratory has shown that Grainyhead-like 2 (GRHL2) protein can enhance the replicative lifespan of NHOK by activating telomerase gene. Since telomerase is required for maintenance of cancer phenotype, his laboratory is investigating the role of GRHL2 in oral carcinogenesis.

Sunil Kapila, B.D.S., M.S., Ph.D. (skapila@dentistry.ucla.edu) – Our research interest lies in: 1) Pathobiology and Omics of TMJ Degenerative Disorders, 2) Translational Efficacy of Biomolecules in Regulating Tooth Movement and Bone Regeneration, 3) Development of Drug Delivery Systems and Bone Regenerative Medical Devices, and 4) 3D Imaging for Diagnostic Efficacy, Treatment Outcomes, and Virtual Treatment Planning.

Reuben Kim, D.D.S., Ph.D. (rkim@dentistry.ucla.edu) – Our main research area is aging biology with specific focuses on; 1) Role of HPV and epigenetics in Oral cancer, 2) Role of p53 in cellular senescence and organismal aging in normal human keratinocytes, 3) Molecular mechanisms of drug-induced ONJ using mouse models for bisphosphonate and denosumab, and 4) Effects of dental materials in reparative dentin formation in dental pulp stem cells (DPSC).

Yong Kim, Ph.D. (ykim@dentistry.ucla.edu) – Our research interests cover studies on 1) the cellular and molecular functions of p12CDK2-AP1 (cdk2 associated protein 1) in embryonic stem cell differentiation and embryo development; 2) the role of p12CDK2-AP1 and p14CDK2-AP2 in cell cycle regulation and the significance of their differential expression in cellular transformation in relation to check point regulation and apoptosis; 3) epigenetic regulation in embryonic stem cell differentiation and cancer development; and 4) translational application of cell cycle regulatory mechanism for head and neck/oral cancer treatment.

Paul Krebsbach, D.D.S., Ph.D. (pkrebsbach@dentistry.ucla.edu) – Our research focuses on the cell and molecular biology of mineralized tissues and self-renewal of adult and pluripotent stem cells.

Min Lee, Ph.D. (leemin@ucla.edu) – Our research focuses on the development of biomimetic polymer systems for tissue regeneration and drug delivery applications.

Yi-Ling Lin, D.D.S., D.M.Sc. (ylin@dentistry.ucla.edu) – Our research focuses on transcription regulation during osteoclast differentiation. The lab is aiming at developing therapeutic strategies to inhibit osteoclast activity for osteolytic diseases such as periodontitis and cancer bone metastasis.

Honghu Liu, Ph.D. (hhliu@dentistry.ucla.edu) – Our research interests include research design (particularly at clinical, epidemiologic and health services research level), sample size and power analysis, statistical design, sampling and patient recruitment, data and statistical analysis, and complex statistical modeling (e.g., repeated measures mixed effect models).

Dr. Renate Lux, Ph.D. (rlux@dentistry.ucla.edu) – The primary focus of our research is to gain an extensive understanding of bacterial interactions with a special emphasis on oral biofilm formation and the implications for oral pathogenesis on a molecular level. In addition, we investigate oral microbial community composition and dynamics in response to environmental changes.

Carl Maida, M.A., Ph.D. (cmaida@dentistry.ucla.edu) - Our research focuses on the prevention and treatment of chronic and epidemic disease, and on the impact of community-scale trauma on children, adolescents, and their families. Recent research studies include assessment of multiple systematic reviews for tissues of the teeth and if left untreated leads to tooth loss. Although bacterial plaque is central in disease pathogenesis, 50% of the disease is heritable. Thus, discovering genetic traits that correlate with periodontal inflammation and bone loss is important in identifying individuals prone to the disease, as well as in discerning signaling cascades that underlie disease pathophysiology.

Sanjay M. Mallya B.D.S., M.D.S., Ph.D. (smallya@dentistry.ucla.edu) - Our research is focused on the molecular mechanisms of oral precancer and cancer and on parathyroid neoplasia. We are studying the role of vitamin D in modulating the development of oral epithelial dysplasia and neoplasia and its interactions with the cyclin D1 pathway.

Diana V. Messadi, D.D.S., M.M.Sc., D.M.Sc. (dmessadi@dentistry.ucla.edu) – Our research focus is to study the effect of chemopreventive agents on oral pre-cancer lesions and we are also investigating novel non-invasive techniques for oral cancer diagnosis.

Alireza Moshaverinia, D.D.S., M.S., Ph.D., F.A.C.P. (amoshaverinia@dentistry.ucla.edu) – Our research focus is to study Dental Biomaterials, tissue engineering and Stem cell biology, implant dentistry and prosthodontics, and dental materials.

Ichiro Nishimura, D.D.S., D.M.Sc., D.M.D. (inishimura@dentistry.ucla.edu) - Our long-term research goal is to implement new reconstructive treatments for the regeneration of facial defects. The field of study is Tissue Engineering. Fully differentiated adult tissues contain a small population of less differentiated stem cells. It has become increasingly clear that these adult stem cells may be redirected to express various useful phenotypes for tissue regeneration. Our research strategies address the opposite end of this spectrum: how to stop the unwanted tissue differentiation such as scar and fibrosis formation. The current projects focus on the identification and characterization of molecular mechanisms activated during adult tissue wound healing.

Takahiro Ogawa, D.D.S., Ph.D. (togawa@dentistry.ucla.edu) – Our research in biomaterial science and bone biology includes the genetic characterization at bone-titanium interface, titanium implant surface science and technology, nano-designing of biomaterials, detoxification and activation of oxidant-generating materials, and an exploration of osteogenic enhancing molecules.

No-Hee Park, D.M.D., Ph.D. (nhpark@dentistry.ucla.edu) –Our research aims to understand the mechanism of the development of cancer in the region of head and neck. Particularly, we are working with the role of DNA viruses and their oncogenes on the transformation of normal cells into malignant phenotypes. Also, my laboratory is working with DNA repair, tumor suppressor genes, and the development of new therapy modes for cancer.

Flavia Pirih, D.D.S., Ph.D. (fpirih@dentistry.ucla.edu) – Our research focuses on the understanding of the basic and clinical aspects of periodontitis and peri-implantitis, with the ultimate goal of developing new strategies to prevent and treat both conditions. She conducts translational research that examines the role of genetics in patients' susceptibility to periodontitis and is developing an animal model to study experimental peri-implantitis.

Kumar C. Shah, B.D.S., M.S. (prosthodontist@ucla.edu) – Our research focuses on various aspects of prosthodontics.

Vivek Shetty, D.D.S., D.M.D. (vshetty@dentistry.ucla.edu) - Our research interests are defined by the significant and disproportionate burden of traumatic injury and its sequelae in vulnerable populations (e.g., socioeconomically marginalized racial/ethnic minorities, uninsured, elderly) and sited at the intersection of discovery science and patient care.

Ki-Hyuk Shin, Ph.D. (kshin@dentistry.ucla.edu) – Our research interest has been focused on molecular mechanisms of oral carcinogenesis and cellular senescence, and cancer stem cell biology.

Igor Spigelman, Ph.D. (ispigelman@dentistry.ucla.edu) – Our research focuses on the mechanisms and relief of chronic pain and addiction utilizing various multidisciplinary approaches. This includes studies on the alterations of voltage- and ligand-gated ion channels in orofacial pain and headache, and development of novel pharmacotherapies and non-viral gene delivery methodologies.

Sotirios Tetradis, D.D.S., Ph.D. (stetradis@dentistry.ucla.edu) – Our research focuses on mineralized tissue biology as it applies to craniofacial structures. We study the pathophysiology of osteonecrosis of the jaws (ONJ), as well as anabolic and catabolic pathways that regulate osteoblast differentiation and function.

Hung Ton-That, Ph.D. (htonthat@dentistry.ucla.edu) – Our laboratory primarily focuses on three major areas of research, aiming to elucidate the molecular mechanisms of pathogenicity by Gram-negative and Gram-positive pathogens. We employ a multidisciplinary approach combining classical and modern techniques that include genetics, various biochemical methods, electron microscopy, electron cryo-tomography, X-ray crystallography, biophysics, mass spectrometry, cell-based assays, and rodent models of infection.

Nini Tran, D.D.S., Ph.D. (ninic@dentistry.ucla.edu) – Our research focuses on diagnostics and therapeutics of early childhood caries (ECC) related to microbiome and host susceptibility. She conducts basic and translational research examining the role of *Streptococcus mutans* and the oral microbial communities in children's susceptibility to ECC.

Cun-Yu Wang, D.D.S., Ph.D. (cwang@dentistry.ucla.edu) – Our research pertains to oral infection and immunity; adult stem cells and regenerative medicine; oncogenesis and signal transduction.

Fang Wei, Ph.D. (fwei@dentistry.ucla.edu) - My current research focuses on biosensor for early diagnostics of high impact human disease via biomarkers in body fluids, including saliva. Specifically, real-time non-invasive monitoring of exosomal oncogenic mutations in human cancer patients in saliva and other body fluids are emphasized.

Shane White, B.Dent.Sc., M.S., M.A., Ph.D. (snwhite@dentistry.ucla.edu) – Our research includes natural and artificial dental biomaterials, especially in genetic-structural relationships for enamel and dentin, connecting genes to their resultant proteins, and to the biomechanical function of teeth. Other bodies of work have focused upon dental cements, ceramics, and endodontic materials.

David Wong, D.M.D., D.M.Sc. (dwong@dentistry.ucla.edu) – Our research focuses on the systems approach to oral cancer and Sjögren's syndrome pathogenesis and the development of basic and translational sciences of saliva into a clinical diagnostic fluid.

Benjamin Wu, D.D.S., Ph.D. (benwu@dentistry.ucla.edu) – Our research in bioengineered materials involves: the formation of biomimetic apatites, development of bioinspired growth factors, mathematical modeling of *in vivo* moving boundary diffusion-reaction problems during tissue engineering and cancer survival, and engineering of biomimetic microenvironment to deliver cells, proteins, and genes to promote repair and regeneration of hard and soft tissues.

Fariba Younai, D.D.S. (fyounai@dentistry.ucla.edu) - Our research interests are focused on oral health issues in HIV infection.

Bo Yu, D.D.S., Ph.D. (boyu@dentistry.ucla.edu) – Our research interests lie in bone biology and stem cell-mediated regeneration. Previous and ongoing work focus on: 1) the molecular interactions between inflammation and bone metabolism in systemic and craniofacial bone diseases such as osteoporosis and periodontitis; 2) epigenetic regulation of stem cell differentiation and cell fate determination.

Xinli Zhang, M.D., Ph.D. (xzhang@dentistry.ucla.edu) – Our research has been primarily focused on identifying functionalities, delineating the underlying molecular mechanisms, and exploring the translational potentials of an osteogenic factor Nell-1. Other research areas include skin wound healing, craniofacial anomalies, and comparative pathology in general.