

Research Mentor Directory For CDM Students

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Updated December 8, 2009

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Public/Community Health

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Helen Lu
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Index of Research Mentors

Kavita Ahluwalia, DDS, MPH - Community Health, CDM
Thomas J. Cangialosi, DDS - Orthodontics, CDM
Angela Christiano, PhD - Genetics & Development and Dermatology, P&S, CDM
Jeanine D'Armiendo, MD, PhD - Medicine, P&S
Burton L. Edelstein, DDS, MPH - Community Health, CDM
Sidney Eisig, DDS - Oral and Maxillofacial Surgery, CDM
Vicky Evangelidis-Sakellson, DDS, MPH - Restorative, CDM
Pamela Factor-Litvak, PhD - Epidemiology, SPH
James Burke Fine, DMD - Periodontics, CDM
John T. Grbic, DMD, MS, MMSc - Periodontics, CDM
Gunnar Hasselgren, DDS, PhD - Endodontics, CDM
Tom K. Hei, PhD - Radiation Oncology, CDM
Emil Kozarov, DDS - Periodontics, CDM
Carol Kunzel, PhD - Community Health, CDM
Evanthia Lalla, DDS, MS - Periodontics, CDM
Ira B. Lamster, DDS, MMSc - Dean's Office, CDM
Helen H. Lu, PhD - Biomedical Engineering, CDM
Amy MacDermott, PhD - Physiology & Cellular Biophysics, P&S
Louis Mandel, DDS - Oral and Maxillofacial Surgery, CDM
Jeremy Mao, DDS - Orthodontics, CDM
Dennis A. Mitchell, DDS, MPH - Community Health, CDM
Letty Moss-Salentijn, DDS, PhD - Anatomy and Cell Biology, P&S; Dean's Office, CDM
David M. Owens, Ph.D - Dermatology and Pathology, P&S
Panos Papananou, DDS, PhD - Periodontics, CDM
Srikala Raghavan, PhD - Oral Surgery and Dermatology, CDM
Ann Marie Schmidt, MD - Surgery, P&S
Ulrike Schulze-Späte, DDS - Periodontics, CDM
Ying-Ju Sung, MD - Pathology & Cell Biology, P&S
Raymond I. Stark, MD - Pediatrics and Perinatology in Ob/Gyn, P&S
Lynn M. Tepper, EdD - Behavioral Science, CDM and The School Of Public Health
Benjamin Tycko, MD, PhD - Pathology, P&S
Gordana Vunjak-Novakovic, PhD - Biomedical Engineering, CDM
Athanasios Zavras, DDS - Oral Epidemiology & Biostatistics, CDM
John L. Zimmerman, DDS - Informatics, CDM

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Kavita Ahluwalia, DDS, MPH  
E-mail: [kpa8@columbia.edu](mailto:kpa8@columbia.edu) Telephone: 342-1938  
Title: Assistant Professor  
Dept/Div: Community Health  
Location: 601 West 168<sup>th</sup> Street, Suite 35

**Key words:** oral health related quality of life, aging, daily oral care.

**Research Activities:** Within the area of population based research the focus of my research is on oral health and oral health-related quality of life in the elderly. I have a special interest in daily oral care and prevention of oral diseases among homebound and institutionalized older adults.

**Selected references:**

**Ahluwalia KP.** Oral health care for the elderly: more than just dentures. *American Journal of Public Health* May 2004; 94(5): 698.

**Ahluwalia KP,** Cheng Bin, Josephs P, Lalla E, Lamster IBL. Oral disease experience of older adults seeking oral health services. *Gerodontology*, September 8 2009 [epub ahead of print].

Ramirez M, **Ahluwalia KP,** Teresi J. Correlates of dental visits among community residing Latino elders: A public health alert. *Gerodontology* August 17 2009 [epub ahead of print].

-----Expected time commitment: -----  
Summer: FULL TIME Fall or Spring: 4-6 HRS/WK

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Thomas J. Cangialosi, DDS  
E-mail: [tjc1@columbia.edu](mailto:tjc1@columbia.edu) Telephone: 305-3875  
Title: Professor and Director, Division Of Orthodontics  
Dept/Div: Orthodontics  
Location: VC 9-219

**Key words:** Measurement methods, computerized cephalometrics and prediction

**Research Activities:** Use of finite element and boundary element analysis in measurement of growth and treatment effects. Computerized cephalometrics and prediction.

**Selected references:**

Leifert MF, Leifert MM, Efstratiadis SE, **Cangialosi TJ.** (2009) Comparison of space analysis evaluations with digital models and plaster dental casts. *AJO-DO* Vol.136 Issue 1 pages 16,e1-16e4

Santoro M, Galkin S, Teredesai M, Nicolay OF, **Cangialosi TJ.** (2003) Comparison of measurements on digital plaster models. *Am. Jour. Of Orthodontics & Dentofacial Orthopedics.* 124(1):101-5.

Santoro M, Nicolay OF, **Cangialosi TJ.** (2001) Pseudoelasticity and thermoelasticity of nickel-titanium alloys: a clinically oriented review. Part II: Deactivation forces. *Am. Jour. Of Orthodontics & Dentofacial Orthopedics.* 119(6): 594-603.

**Cangialosi TJ,** Chung JM, Elliott DR, Meistrell ME Jr. (1995) Reliability of computer-generated prediction tracing. *Angle Orthodontist.* 65(4): 277-84

**Cangialosi TJ,** Moss ML, McAlarney ME, Nirenblatt BD, Yuan M. (1994) An evaluation of growth changes and treatment effects in Class II , Division 1 malocclusion with conventional roentgenographic cephalometry and finite element method analysis. *American Journal of Orthodontics & Dentofacial Orthopedics.* 105(2): 153-60.

-----Expected time commitment: -----

Summer: FULL TIME Fall or Spring: To be Determined

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Angela Christiano, PhD  
E-mail: [amc65@columbia.edu](mailto:amc65@columbia.edu) Telephone: 305-9565  
Title: Professor  
Dept/Div: Genetics and Development and Dermatology  
Location: Vanderbilt 1526

**Key words:** Inherited human skin and hair disorders; genetic linkage, gene discovery and mutation analysis, epidermal biology. Molecular aspects of the cutaneous basement membrane zone, adhesion junctions; hemidesmosomes; desmosomes; epidermal appendages; hair; teeth.

**Research Activities:** In our most recent work, we initiated two projects aimed at gaining insights into genes governing the morphogenesis and development of two important epidermal appendages: hair and teeth. First, we cloned a gene associated with an inherited form of human congenital alopecia, known as generalized atrichia. Affected individuals are born with infant hair that falls out and never grows back. We mapped the disease to chromosome 8p21 in humans, and subsequently cloned a gene called hairless, responsible for hairlessness in mice. In addition to human congenital alopecia, mutations in this gene also underlie the hairless and rhino phenotypes in mice. Hairless appears to have a multitude of functions, and its relationship to thyroid hormone, transcriptional co-repression and apoptosis, among other cell events, is currently under intense investigation. We have collected many additional families with Mendelian forms of inherited hair defects, and complex trait mapping studies are currently underway directed at identifying genetic susceptibility in alopecia areata and androgenic alopecia. Hairless was the first gene identified to be implicated in hair cycle regulation, and we anticipate that as the work unfolds this discovery will lead us to a better understanding of the genetic control of the hair cycle. More recently, we mapped the first locus involved in autosomal recessive hypodontia (tooth malformations) to chromosome 16, and the search for the gene is underway. Taken together, we anticipate this line of investigation will reveal a pathway(s) for the formation of epidermal appendages, which may bring us closer to answering long-standing mysteries in skin biology, such as the quest for elusive stem cells in the skin.

[Link for more information on Dr. Christiano's research.](#)

**Selected references:**

Tardin-Strapps M, Warburton D, Salas-Alanic JC, Lopez-Cepeda LD, **Christiano AM.** (2004) Fishing for new genes in skin biology: impact of cytogenetics on gene discovery. *Clinical Genetics.* 66(2): 94-106.

Tardin-Strapps M, Warburton D, Baumeister FA, Fischer SG, Yonan J, Gilliam TC, **Christiano AM.** (2004) Cloning of breakpoints of a de novo inversion of chromosome 8, inv (8)(p11.2q23.1) in a patient with Ambras Syndrome. *Cytogenic & Genome Research.* 107(1-2): 68-76.

Ahmad W, Brancolini V, Faiyaz ul Haque M, Lam HM, ul Haque S, Haider M, Maimon A, Aita VM, Owen J, Ahmad M, Ott J, and **Christiano AM.** (1998) A Locus of Autosomal Recessive Hypodontia with Associated Dental Anomalies Maps to Chromosome 16p13. *AM. J. Hum. Genet.* 62, 987-991.

-----Expected time commitment: -----  
Summer: FULL TIME Fall or Spring: N/A

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Jeanine D'Armiento, MD, PhD  
E-mail: [jmd12@columbia.edu](mailto:jmd12@columbia.edu) Telephone: 305-3745  
Title: Assistant Professor  
Dept/Div: Medicine  
Location: P&S 9-449

**Key words:** Atherosclerosis, chronic lung disease, matrix metalloproteinases.

**Research Activities:** Dr. D'Armiento's research focuses on understanding the role of matrix metalloproteinases (MMP) in normal physiology and in human disease, with an emphasis on the processes leading to tissue destruction in the lung and vasculature. Her laboratory integrates both *in vitro* and *in vivo* approaches and is uniquely situated to characterize the molecular changes in the study of smoke-induced injury and disease so as to identify potential therapeutic targets for smoke induced disease processes. She has established several mouse models of lung disease utilizing transgenic mouse technology and her laboratory has expertise in the smoke induced model of lung injury utilizing several animal species including mice, guinea pigs, and rabbits.

[Link for more information on Dr. D'Armiento's work.](#)

**Selected references:**

Mercer BA, Kolesnikova N, Sonett J, and **D'Armiento J.** (2004) Extracellular regulated kinase/mitogen activated protein kinase is up-regulated in pulmonary emphysema and mediates matrix metalloproteinase-1 induction by cigarette smoke. *J Biol Chem* 279:17690-17696.

Lemaitre V, Soloway PD, and **D'Armiento J.** (2003) Increased medial Degradation with Pseudo-aneurysm Formation in ApoE Knockout Mice deficient in Tissue Inhibitor of Metalloproteinases-1. *Circulation*.107: 333-338.

Foronjy RF, Okada Y, Cole R, and **D'Armiento J.** (2003) Progressive Adult-Onset Emphysema in Transgenic Mice Expressing Human MMP-1 in the Lung. *Am. J. Physiol. Lung Cell Mol. Physiol.* 284:L727-37.

-----Expected time commitment: -----  
Summer: FULL TIME Fall or Spring: 10-15 HRS/WK

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Burton L. Edelstein, DDS, MPH  
E-mail: [ble22@columbia.edu](mailto:ble22@columbia.edu) Telephone: 342-3550  
Title: Professor and Chair  
Dept/Div: Social and Behavioral Sciences, CDM  
Location: 601 West 168<sup>th</sup> Street, Suite 32

**Key words:** governmental affairs, oral health policy, underserved population, dental workforce, Medicaid

**Research Activities:** I engage in studies that inform federal and state policymakers so that they can legislate programs in ways that are consistent with sound information and administer programs that effectively increase access to dental care and improve the oral health of America's children and other vulnerable populations. Our studies of dental care financing and delivery, analyses of legislation, evaluation of programs, and work on the integration of primary medical and dental care all have direct policy implications. We utilize qualitative and quantitative research methods, rely on epidemiologic reasoning, build clinical and public policy arguments based on scientific evidence and scientific rationales, and conduct studies that address specific governmental activities. The output of our work is as likely to be a "policy brief" or "monograph" aimed at a specific professional, advocacy, or governmental community as it is a peer-reviewed article. A second primary area of interest involves the medical management of pediatric dental caries by employing social, behavioral, educational, and pharmacotherapeutic interventions with a special emphasis on perinatal and early childhood populations.

**Selected recent references:**

Peer reviewed articles:

**Edelstein BL.** (2009) Putting teeth in CHIP: 1997-2009 retrospective on Congressional action on children's oral health. *Academic Pediatrics*.

**Edelstein BL,** Chinn CH. (2009) Update on disparities in oral health and access to dental care for America's children. *Academic Pediatrics*

**Edelstein BL.** (2009) Solving the Problem of Early Childhood Caries: A Challenge for Us All. *Archives of Pediatrics and Adolescent Medicine*.

Casamassimo PS, Thikkurissy S, **Edelstein BL,** Maiorini E. (2009) Beyond the dmft: The Human and economic Cost of Early Childhood Caries. *J Am Dent Assoc. J Am Dent Assoc* 2009; 140: 650-657.

Southward LH, Robertson A, **Edelstein BL,** Hanna H, Wells-Parker E, Baggett DH, Eklund NP, Crall JJ, Silberman SL, Parrish DR. (2008) Oral health of young children in Mississippi Delta child care centers: a second look at early childhood caries risk assessment. *J Public Health Dent* 68:188-95.

Book Chapters

**Edelstein BL**, Chinn CH. (2009) Definition and Epidemiology of Early Childhood Caries. In Berg J and Slayton R. Early Childhood Oral Health. Blackwell Publishing.

Yoder K, **Edelstein BL**. (2009) The Child in the Contexts of Family, Community, and Society. In. Dentistry for the Child and Adolescent, 9<sup>th</sup> Edition. Macdonal RE, Avery DR, and Dean JA. Eds. Elsevier Publishing.

Monographs

**Edelstein BL**. (2008) *Environmental Factors in Implementing the Dental Home for All Young Children*. US Department of Health and Human Services, Health Resources and Services Administration, Maternal and Child Health Bureau, Rockville, MD.

**Edelstein BL**. (2009) *Maximizing Public Dollars in the Provision of Dental Care in New York State*. Community Health Foundation of Western and Central New York, Buffalo NY.

-----Expected time commitment: -----

Summer: To be determined Fall or Spring: To be determined

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Sidney B. Eisig, DDS
E-mail: sbe2002@columbia.edu Telephone: 305-7626
Title: Director and Chief of Service
Dept/Div: Oral and Maxillofacial Surgery
Location: Harkness Pavilion 872

Key words: Craniomaxillofacial deformities

Research Activities: The use of new technologies in treating patients with maxillofacial deformities.

Selected references:

Landesberg R, Burke A, Pinsky D, Katz R, Vo J, **Eisig SB**, Lu HH. Activation of platelet-rich plasma using thrombin receptor agonist peptide. *J Oral Maxillofac Surg*, 63(4): 529-535, 2005

Tsay RC, Vo J, Burke A, **Eisig SB**, Lu HH, Landesberg R. Differential growth factor retention by platelet-rich plasma composites. *J Oral Maxillofac Surg*, 63(4): 521-528, 2005

Eisig SB, Ho V, Kraut R, Lalor P. (2003) Alveolar ridge augmentation using titanium micromesh: an experimental study in dogs. *J. Oral Maxillofac. Surg.*, 61(3): 347-53.

Eisig SB, Hall C, Goodrich JT, Feghali J. (2000) Two-piece Le Fort I Osteotomy for cranial base access. *J. Oral Maxillofac. Surg.* 58: 482-486.

Mankad B, Cisneros GJ, Freeman K, **Eisig SB**. (1999) Prediction accuracy of soft tissue profile in orthognathic surgery. *Intern. J. Adult Orthod. Orthognath. Surg.* 14:19-26.

Joseph AA, Elbaum J, Cisneros GJ, **Eisig SB**. (1998) A comparative study of the cephalometric soft tissue airway dimension in hyperdivergent and normodivergent individuals. *J. Oral Maxillofac. Surg.*, 546:135-139.

-----Expected time commitment: -----

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Vicky Evangelidis-Sakellson, DDS, MPH
Email: ve4@columbia.edu Telephone 212 305-4330
Title: Associate Professor
Dept/ Div: Adult Dentistry
Location: PH7 Stem Room 138

Key words: medically compromised patients, outcomes of patient care, predictors of clinical performance, patient care, comprehensive care.

Research activities: Dr. Evangelidis has a long-standing interest on comprehensive patient care and the impact of a clinical teaching environment without discipline driven requirements on student learning, student performance and on provision of comprehensive patient care. She is also interested on the outcomes of care for patients who present for oral care and a medically compromised versus patients who present with no systemic disease or conditions. She has presented at educators meetings on a national level, on the topics predictors of student clinical performance, student learning, gender issues related to productivity and outcomes of care.

Selected References:

Evangelidis-Sakellson V, Lamster Ira B. Outcomes of care for medically compromised patients and older patients in a pre-doctoral environment. Submitted for publication, February 2008, currently on revision.

Evangelidis-Sakellson V. Outcomes of care for medically compromised and geriatric patients in a pre-doctoral Environment. JDE, Jan 2007, Abstract.

Evangelidis-Sakellson V, Calero-Breckheimer Ayxa, Lichtenthal Richard. Does Medical History Matter in Dental Care Outcomes? March 2006, Abstract.

Evangelidis Sakellson V, Lichtenthal Richard. Predictive Value of Subjective Evaluations in Timely Graduation of Students. Journal of Dental Education, Abstract 69:149, 2005

Evangelidis-Sakellson V, Lichtenthal RM. Predictors of Clinical Performance. Journal of Dental Education, 2005, Abstract. 69:149

-----Expected time commitment: -----

Summer: To be Determined or Spring: To be Determined

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Pam Factor-Litvak, PhD
E-mail: prfl@columbia.edu Telephone: 305-7851
Title: Assistant Professor
Dept/Div: Epidemiology Location: PH 18-106

Key words: environmental exposure, neurological/neuropsychological development, dental amalgams, renal function

Research activities: Dr. Factor-Litvak has a long-standing interest in the associations between environmental exposures and neurological/neuropsychological development and, secondarily, with renal function. For the last ten years she has collaborated with Dr. Graziano on his studies of lead exposure, pregnancy outcomes, and infant development. She has also collaborated with Dr. Michal Eldan on a study of the neuropsychological function of bromine miners in Israel. Currently she is the principal investigator of a large epidemiological investigation of the associations between low dose mercury exposure, derived from dental amalgam restorations, and neuropsychological function in a cohort of approximately 800 employed adults. She recently initiated a study of autism and the environment in New Jersey. This is an ecological analysis of autism rates, derived from special education statistics and residential proximity to federal and state hazardous waste sites and will provide pilot data for a larger individual level study of autism and the environment.

[Link for more information on Dr. Factor-Litvak's work.](#)

Selected references:

Factor-Litvak P, Hasselgren G, Jacobs D, Begg M, Kline J, Geier J, Mervish N, Schoenholtz S, Graziano J. (2003) Mercury derived from dental amalgams and neuropsychologic function. *Environmental Health Perspectives*. 111(5): 719-23.

Wasserman GA, **Factor-Litvak P**, Liu X, Todd AC, Kline JK, Slavkovich V, Popovac D, Graziano JH. (2003) The relationship between blood lead, bone lead and child intelligence. *Child Neuropsychology*. 9(1): 22-34.

Graziano J, Slavkovich V, Liu X, **Factor-Litvak P**, Todd A. (2004) A prospective study of prenatal and childhood lead exposure and erythropoietin production. *Journal of Occupational & Environmental Medicine*. 46(9): 924-9.

-----Expected time commitment: -----
Summer: FULL TIME Fall or Spring: 10-15 HRS/WK

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James Burke Fine, DMD
E-mail: jbf1@columbia.edu Telephone: 305-9289
Title: Associate Professor
Dept/Div: Periodontics
Location: PH 7E-125

Key words: Dentistry and the cardiac and renal transplant patient

Research activities: Master's thesis supervision for postdoctoral students only

Selected references:

Grbic JT, Mitchell DA, **Fine JB**, Phelan JA, Bucklan RS, Zambon JJ, Lamster IB. (1995) The relationship of candidiasis to linear gingival erythema in HIV-infected homosexual men and parenteral drug users. *Journal of Periodontology*. 66(1): 30-7.

Lamster IB, Begg MD, Mitchell D, **Fine JB**, Grbic JT, Todak GG, el-Sadr W, Gorman JM, Zambon JJ, Phelan JA. (1994) Oral manifestations of HIV infection in homosexual men and intravenous drug users. Study design and relationship of epidemiologic, clinical, and immunologic parameters to oral lesions. *Oral Surgery, Oral Medicine, Oral Pathology* 78(2): 163-74.

Lamster IB, Celenti RS, Jans HH, Grbic JT. (1993) Current status of tests for periodontal disease. [Review] [23 refs] *Advances in Dental Research*. 7(2): 182-90.

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John T. Grbic, DMD, MS, MMSc  
E-mail: [jtg2@columbia.edu](mailto:jtg2@columbia.edu) Telephone: 305-4640  
Title: Associate Professor and Director, Center For Clinical Research in Dentistry  
Dept/Div: Periodontics  
Location: Clinical Center for Research in Dentistry

**Key words:** clinical research, periodontal diagnostics, HIV associated periodontal diseases

**Research activities:** My laboratory studies the use of gingival crevicular fluid (GCV), saliva, and serum in the diagnosis of periodontal disease. We also study risk factors for periodontal disease and perform statistical analysis of clinical trials.

**Selected references:**

Engbretson SP, Hey-Hadavi J, Ehrhardt FJ, Hsu D, Celenti RS, **Grbic JT**, Lamster IB, (2004) Gingival crevicular fluid level of interleukin-1beta and glycemic control in patients with chronic periodontitis and type 2 diabetes. *J. Periodontol.* 75(9): 1203-8.

Lamster IB, Kaufman E, **Grbic JT**, Winston LJ, Singer RE. (2003) Beta-glucuronidase activity in saliva: relationship to clinical periodontal parameters. *J. Periodontol.* 74(3): 353-9.

Engbretson SP, **Grbic JT**, Singer R, Lamster IB. (2002) GCF IL-1beta profiles in periodontal disease. *J. Clin. Peridontol.* 29(1) 48-53.

-----Expected time commitment: -----  
Summer: FULL TIME Fall or Spring: 1 FULL DAY/WEEK

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Gunnar Hasselgren, DDS, PhD
E-mail: bgh1@columbia.edu Telephone: 305-6736
Title: Professor and Director, Endodontics
Dept/Div: Endodontics
Location: PH 7E-117

Key words: Endodontics, hard tissue, hard tissue resorption, pulp

Research activities: Dental hard tissues; biology of endodontically related areas.

Selected references:

- Moss ML, Moss-Salentijn L, **Hasselgren G**, Ling H. (2005) A quantum biological hypothesis of human secondary dentinogenesis. *Medical hypotheses* 64, 479-486
- Moss ML, Ling H, Moss-Salentijn L, **Hasselgren G**. (2004) Clustered water of mineralized tissues enable quantum mechanical events. *17th ASCE Engineering Mechanics Conference*. Paper ID 279.
- Bergenholtz G, **Hasselgren G** (2003) Endodontics and Periodontics. Chapter 14 in *Clinical Periodontology and Implant Dentistry*. 4th Edition. Eds. Lindhe J, Karring T, Zehnder M, Grawehr M, **Hasselgren G**, Waltimo T. (2003) Tissue-dissolution capacity and dentin-disinfecting potential of calcium hydroxide mixed with irrigating solutions. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* (5): 608-13.
- Gupta R, **Hasselgren G**. (2003) Prevalence of odontogenic sinus tracts in patients referred for endodontic therapy. *Journal of Endodontics* 29, 12; 798-800.
- Zehnder M, Gold SI, **Hasselgren G**. (2002) Pathologic interactions in pulpal and periodontal tissues. *Journal of Clinical Periodontology* 29(8); 663-671.
- Hasselgren G**. (2000) Pains of dental origin. In: *Oral and Maxillofacial Surgery Clinics of North America*. WB Saunders, Philadelphia. pp 263-273.
- Hasselgren G**. (1998) Treatment of the Exposed Dentin-Pulp Complex. In *Essential Endodontology*. Eds. Pitt-Ford T, Ørstavik D. Blackwell, London. pp 192-210.
- Lang NP. Blackwell Munksgaard, Oxford, Copenhagen. Pp 318-351.
- Rossman L, **Hasselgren G**, Wolcott J. Orofacial Dental Pain: Endodontic Diagnosis and management of Dental Pain/Infection Emergencies. Chapter 2 in *Pathways of the Pulp*. In Press

-----Expected time commitment: -----
Summer: FULL TIME Fall or Spring: minimum one day per week
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Tom K. Hei, PhD

E-mail: [thk1@columbia.edu](mailto:thk1@columbia.edu) Telephone: 305-8462

Title: Professor and Vice Chairman

Associate Director, Center for Radiological Research

Dept/Div: Radiation Oncology, Center for Radiological Research and Department of Environmental Health Sciences, Mailman School of Public Health

Location: VC 11-205

**Key words:** radiation carcinogenesis, mutagenesis, non-targeted effects, oxidative damage

**Research activities:** Dr. Hei's research program focuses on environmental carcinogenesis, specifically mechanism of radiation and chemical carcinogenesis/mutagenesis at the cellular and molecular levels. Immortalized human lung and breast epithelial cells are used to examine the how and why of the multistage nature of cancer induced by such agents as ionizing radiation (radon), asbestos, arsenic, and tobacco smoke. A unique microbeam is used to ascertain the signaling pathways involved in the non-targeted response. A transgenic mouse model is developed to examine the tumor suppressor function of the TGFβI gene.

Link for more information on Dr. Hei's work.

<http://www.cumc.columbia.edu/dept/radoncology/crr/hei.htm>

**Selected references:**

**Hei, T.K.,** Zhou, H., Ivanov, V.N., Mei, H., Lieberman, H.B., Brenner D.J., Amundson, S.A., and Geard, C.R. Mechanism of radiation induced bystander effects: A unifying model. *Journal of Pharmacy and Pharmacology* 60:943-950, 2008.

Li, H.Y., Balajee, A., Su, T., Cen, B., **Hei, T.K.,** and Weinstein, I.B. The novel tumor suppressor gene Hint1 associates with the TIP60 complex and regulates DNA damage response. *J. Cell Biol.* 183: 253-265, 2008.

Zhang, Y., Wen, G.Y., Shao, G., Wang, C.D., Lin, C. S., Bhagat, G., Balajee, A., **\*Hei, T.K.,** and **\*Z hao, Y .L.,** B igh3 de ficiency i nduces g enomic i nstability a nd pr edisposes m ice t o spontaneous tumor development. *Cancer Research* 69:37-44, 2009.

Xu, A., C hai, Y., N ohmi, T., and **Hei, T.K.,** Genotoxic r esponses t o t itanium di oxide nanoparticles and fullerene i n gpt delta transgenic MEF cells. *Particle and Fiber Toxicology* 6:3, 2009.

Ivanov, V. N., Zhou, H., Partridge, M.A., and **Hei, T.K.,** I nhhibition of A taxia T elangiectasia Mutated Kinase activity enchances TRAIL-Mediated a poptosis i n human m elanoma c ells. *Cancer Research* 69: 2009.

Hei, T.K., Mechanism of fiber carcinogenesis: From extranuclear target to transforming growth factor signaling pathway. *Advances in Mol. Toxicology* 3: 43-55, 2009.

-----Expected time commitment: -----

Summer: FULL TIME Fall or Spring: 10 - 12 HRS/WK

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Emil Kozarov, MS, PhD
Email: ek2522@columbia.edu Telephone: 305-7994
Title: Associate Professor
Dept/Div: Periodontics and Section of Oral and Diagnostic Sciences
Location: PH7-200C

Key words: periodontal, bacterial, vascular, endothelial, atherosclerosis, genomics

Research Activities:

Association of microbial pathogens with vascular inflammation in atherosclerotic patients.
Epidemiological studies have revealed that a high proportion of patients with cardiovascular disease (CVD) have periodontal disease or are edentulous. The inflammatory character of the atheromatous lesion may well be due to an infectious component. Evidence of bacterial presence at the diseased site, isolation and cultivation of the organism and testing of its virulence properties in vitro and in vivo are required to determine a causal relationship. The purpose of this study is to determine if viable organisms can be detected and isolated from atherosclerotic plaques. The specific aims of this study are to isolate clinical strains from vascular atheromatous tissue from patients and to characterize the strains, their invasion phenotype and tissue destruction ability. Genetic, biochemical and tissue culture methods will be used in this study. The isolation of viable bacteria upon completion of this study will lead to the identification, characterization and genetic analysis of clinical strains associated with atherosclerosis.

P. gingivalis clonality and risk for periodontitis. Tissue invasion provides 1) a “privileged niche” with access to host protein and iron substrates; 2) a shelter from the humoral and cellular immune response; 3) a means for persistence that is essential for a chronic and opportunistic pathogen. It is thus our hypothesis that *P. gingivalis* actively interacts with host tissues *in vivo* and that the presence of specific *P. gingivalis* invasion strain-associated virulence factors predetermines the severity of periodontal disease in patients. Therefore we expect the disease phenotype to be associated with a subset of invasion-associated genes. Microarrays will be used in this project to test the hypothesis that the presence of invasive phenotype and periodontal disease in patients is related to the presence of specific *P. gingivalis* invasion-associated virulence factors.

Selected references:

Kozarov E, Dorn B, Shelburne CE, Dunn Jr., WA, and Progulsk-Fox A. Human Atherosclerotic Plaque Contains Viable Invasive *Actinobacillus actinomycetemcomitans* and *Porphyromonas gingivalis*. *Arterioscler Thromb Vasc Biol.* 2005 Mar; 25(3):e17-8.

Kozarov E, Sweier D, Shelburne C, Progulsk-Fox A, Lopatin D. Detection of Bacterial DNA in Atheromatous Plaques by Quantitative PCR. *Microbes and Infection*, 2006 Mar;8(3):687-93.

Li L, Michel R, Cohen J, DeCarlo A, and **Kozarov E**. Intracellular survival and vascular cell-to-cell transmission of *Porphyromonas gingivalis*. *BMC Microbiology* 2008, 8:26.

-----Expected time commitment: -----
Summer: FULL TIME; Fall or Spring: 10 HRS/WK

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Carol Kunzel, PhD
E-mail: ck60@columbia.edu Telephone: 342-3046
Title: Associate Professor of Clinical
Dept/Div: Community Health and
Clinical Sociomedical Sciences, Mailman School of Public Health
Location: 601 W. 168th St., 3rd Floor, Suite 34

Key words: Dentists' knowledge, attitudes and practices; access to care

Research Activities: Dr. Carol Kunzel has been an investigator/co-principal investigator on NIH-funded grants for over 20 years, during which time she has had extensive experience with the development of telephone and mail surveys for national, New York State, and New York City samples of dentist practitioners. These survey research projects involve the measurement of dentists' attitudes, knowledge, clinical behaviors and adherence to practice guidelines, and the identification of influential predictors associated with each, as well as the measurement and identification of factors associated with dentists' willingness to treat HIV+ patients. Most recently Dr. Kunzel's research has focused on dentists' in-office practices in regard to early oral cancer detection, smoking cessation, management of the diabetic patient, obesity prevention, and infection control. In addition Dr. Kunzel has ongoing research in the areas of oral health symptoms and coping strategies of African Americans in Central Harlem and the relation between oral health literacy, utilization of dental services, and oral health among adolescents and their families.

Selected references:

Kunzel C, Lalla E, Albert D, Yin H, Lamster I: "On the Primary Care Frontlines: The Role of the General Practitioner in Smoking-Cessation Activities and Diabetes Management." J Am Dent Assoc 136: 1144-1153, August 2005.

Kunzel C, Lalla E, Lamster I: "Management of the Patient Who Smokes and the Diabetic Patient in the Dental Office." J Periodontology 77: 331-340, 2006.

Kunzel C, Lalla E, Lamster I. Dentists' management of the diabetic patient: Contrasting generalists vs. specialists, Am J Publ Health 97 (4): 725-730, April 2007.

Borrell, LN, **Kunzel C**, Lamster I, Lalla E. Diabetes in the dental office: Using NHANES III to estimate the probability of undiagnosed disease, J Periodont Res 42: 559-565, 2007

Myers R, Larson E, Cheng B, Schwartz A, Da Silva K, **Kunzel C**. Hand Hygiene among General Practice Dentists: A Survey of Knowledge, Attitudes, and Practices. J Am Dent Assoc, 139: 948-957, 2008

Current projects:

Development of a targeted screening protocol for undiagnosed diabetes, for patients who present to a dental office or clinic, based on medical risk factors readily known by the patient and signs of periodontal destruction.

Survey of Central Harlem adults' dental symptoms: The purpose of the study is to describe how adults in Central Harlem, who have experienced an oral symptom within

the past six months, cope with these symptoms, e.g., their approaches to seeking professional care, lay advice, and their self-care strategies.

Needs assessment of the new patients seen at the Harlem United dental clinic by gathering information about their oral health-related behaviors and perceptions. Analyses permit us (1) to identify patient needs and concerns with regard to prior oral health care experiences and conditions.

-----Expected time commitment: -----

Summer: FULL TIME Fall or Spring: Negotiable

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Evanthia Lalla, DDS, MS  
E-mail: [el94@columbia.edu](mailto:el94@columbia.edu) Telephone: 305-9283  
Title: Associate Professor  
Dept/Div: Periodontics  
Location: PH 7E-112

**Key words:** Periodontal infections, diabetes, atherosclerosis, pathogenic mechanisms

**Research activities:** Our research (in collaboration with Dr. Ann Marie Schmidt, Department of Surgery) has focused on exploring molecular mechanisms underlying the pathogenesis of diabetes-associated periodontal disease. Specifically, we have been studying the effects of the interaction of the cellular receptor RAGE with different ligands within the periodontal tissues in diabetes, using different murine models. Currently, we are studying the association between periodontal infections and atherosclerosis, and the related mechanisms both on a cellular and an animal level. Finally, work is being performed on a clinical level trying to dissect the diabetes-periodontal disease relationship in humans, both adults and children/adolescents.

**Selected references:**

**Lalla E**, Lamster IB, Feit M, Huang L, Spessot A, Qu W, Kislinger T, Stern D, Schmidt AM. (2000). Suppression of periodontitis-associated alveolar bone loss in diabetic mice by soluble receptor for AGE. *Journal of Clinical Investigation*; 105(8): 1117-1124.

**Lalla E**, Lamster IB, Hofmann MA, Bucciarelli LG, Jerud AP, Tucker S, Lu Y, Papapanou PN, Schmidt AM. (2003). Oral infection with a periodontal pathogen accelerates atherosclerosis in apolipoprotein E - null mice. *Arteriosclerosis, Thrombosis and Vascular Biology*; 23:1405-1411.

Roth GA, Moser B, Huang SJ, Brandt JS, Huang Y, Papapanou PN, Schmidt AM, **Lalla E**. (2006). Infection with a periodontal pathogen induces procoagulant effects in human aortic endothelial cells. *Journal of Thrombosis and Haemostasis*; 4: 2256-2261

**Lalla E**, Cheng B, Lal S, Kaplan S, Tucker S, Softness B, Greenberg E, Goland R, Lamster IB. (2007). Diabetes mellitus promotes periodontal destruction in children. *Journal of Clinical Periodontology*; 34:294-298

-----Expected time commitment: -----  
Summer: FULL TIME Fall or Spring: 10 HRS/WK

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Ira B. Lamster, DDS, MMSc  
E-mail: [ibl1@columbia.edu](mailto:ibl1@columbia.edu) Telephone: 305-7019  
Title: Dean, College of Dental Medicine  
Dept/Div: Dean's Office  
Location: PH 7-122 East

**Key words:** The relationship of periodontal disease to other diseases and disorders at distant sites, diagnosis of oral diseases, oral health care for older patients, the future of dental education and practice.

**Research activities:** Current research interests include diagnostic testing for periodontal disease, oral infection as a risk factor for systemic diseases, issues surrounding provision of oral health care for older Americans, and the future of dental education.

**Selected references:**

**Lamster IB.** (2008) Northridge ME. (eds.) Improving Oral Health for the Elderly. Springer Science Business Media, LLC, New York.

**Lamster IB,** Wolf DL. Primary health care assessment and intervention in the dental office. *Journal of Periodontology.* 2008:1825-1832

**Lamster IB.** Lalla E. Borgnakke WS. Taylor GN. The Relationship Between Oral Health and Diabetes Mellitus. *The Journal of the American Dental Association.* 2008:195-245.

-----Expected time commitment: -----

Summer: To be Determined Fall or Spring: To be Determined

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Helen H. Lu, PhD

E-mail: [hl2052@columbia.edu](mailto:hl2052@columbia.edu) Telephone: 854-4071

Title: Associate Professor

Dept/Div: Biomedical Engineering & College of Dental Medicine

Location: 1210 Amsterdam Avenue, 351 Engineering Terrace

**Key Words:** Biomaterials, Tissue Engineering, Drug Delivery

**Research Activities:** We are interested in developing tissue engineering solutions to achieve biological integration of soft tissues grafts to hard tissues such as bone, dentin or cementum. Specific project ongoing in the laboratory include stem cell-mediated dental pulp tissue engineering and the design of hydrogel-based growth factor release systems for dental applications. Other interests including design of composite materials for orthopedic and dental repair, as well as mechanisms governing cell-biomaterial interactions.

Link for more information on Dr. Lu's research: [www.bme.columbia.edu/lulab](http://www.bme.columbia.edu/lulab)

**Selected References:**

Tsay RC, Vo J, Burke A, Eisig SB, **Lu HH** and Landesberg R; "Differential growth factor retention by platelet-rich plasma composites", *Journal of Oral and Maxillofacial Surgery*, 63:521-528, 2005.

**Lu HH**, Vo JM, Lin J, Shin S, Cozin M, Tsay R and Landesberg R; "Controlled delivery of growth factors derived from platelet-rich plasma for bone formation", *Journal of Biomedical Materials Research A*, 86A(4):1128-1136, 2008.

**Lu HH**, Scott K, El-Amin SF and Laurencin CT; "Three-dimensional, bioactive, biodegradable polymer-bioactive glass composite scaffolds with improved mechanical properties support collagen synthesis and mineralization by human osteoblast-like cells *in vitro*", *Journal of Biomedical Materials Research*, 64A:465-474, 2003.

-----Expected time commitment: -----

Summer: FULL TIME Fall or Spring: at least 10 HRS/WK

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Amy MacDermott, PhD
E-mail: abm1@columbia.edu Telephone: 305-3889
Title: Professor
Dept/Div: Physiology & Cellular Biophysics; Neuroscience
Location: Black Building 1109

Key words: Synaptic transmission and modulation in the spinal cord dorsal horn

Research activities: The dorsal horn of the spinal cord is important in the processing and transmission of pain information from the body to the central nervous system. Nociceptive primary afferents synapse there using both glutamate and peptide neurotransmitters. Inhibitory local circuitry adds to the complex processing of short- and long-term synaptic modulation of dorsal horn neuron excitability. We are using optical and electrophysiological methods to study several in vitro models of this nociceptive system.

[Link for more information on Dr. MacDermott's research.](#)

Selected references:

Torsney, C **MacDermott, AB.** Disinhibition opens the gate to pathological pain signaling in superficial NK1 receptor expressing neurons in rat spinal cord. J Neurosci. 2006 Feb 8;26(6):1833-43.

Tong, CK, **MacDermott, AB.** Both Ca²⁺ permeable and impermeable AMPA receptors are expressed at synapses between primary afferents and subpopulations of rat dorsal horn. J Physiol. 2006 575(Pt 1):133 44. Epub 2006 Jun 8

Tong CK, Kaftan EJ, **MacDermott AB.** Functional identification of NR2 subunits contributing to NMDA receptors on substance P receptor-expressing dorsal horn neurons. **Mol Pain. 2008 Oct 10;4(1):44.**

Daniele CA, **MacDermott AB.** Low-threshold primary afferent drive onto GABAergic interneurons in the superficial dorsal horn of the mouse. J Neurosci. 2009 Jan 21;29(3):686-95.

-----Expected time commitment: -----
Summer: FULL TIME Fall or Spring: at least 10 HRS/WK

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Louis Mandel, DDS
 E-mail: N/A Telephone: 305-9982
 Title: Clinical Professor and Director, Salivary Gland Center
 Dept/Div: Oral and Maxillofacial Surgery
 Location: Harkness 8

Key words: Saliva, salivary gland diseases, parotid gland, sialosis, radioactive iodine, MALT lymphoma

Research activities: Clinical investigation of salivary gland diseases - Sjogrens, HIV, sialosis, MALT lymphoma, etc. Interested in the effect of radioactive iodine (used for treatment of thyroid cancer) on the parotid gland. Radioisotope study necessary. Salivary chemistry to be utilized.

Selected references:

Mandel L and Patel S. (2002) Sialadenosis associated with diabetes mellitus: a case report. *Journ of Oral Maxillofac. Surg.* 60(6): 696-8.

Mandel L and Surattanont F. (2002) Bilateral parotid swelling: a review. *Oral Surgery Oral Medicine Oral Pathology Oral Radiology & Endodontics.* 93(3): 221-37.

Mandel L and Surattanont F. Miremadi R. (2001) Cat-scratch disease: considerations for dentistry. *Journal of the American Dental Assoc.* 132(7): 738-41.

Mandel SJ and **Mandel L.** (1999) Persistent sialadenitis after radioactive iodine therapy: report of two cases. *Journ of Oral Maxillofac. Surg.* 57(6): 532-3.

-----Expected time commitment: -----
 Summer: To be determined Fall or Spring: To be determined

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Dennis A. Mitchell, DDS, MPH  
E-mail: [dml48@columbia.edu](mailto:dml48@columbia.edu) Telephone: 342-3714  
Title: Assistant Professor  
Dept/Div: Community Health and Periodontics  
Location: P&S 3-452D

**Key words:** Community health/dentistry, diversity, dental education, oral health disparities

**Research activities:** Evaluation of a summer enrichment program targeting pre-health students from underrepresented minority, disadvantaged, and/or rural backgrounds. Pre-health students' knowledge of, exposure to, and views on diversity, health disparities, and related topics. Best practices for preparing underrepresented high school students for health careers.

**Selected references:**

Price SS, Crout RJ, **Mitchell DA**, Brunson WD, Wearden S. Increasing the enrollment of underrepresented students: Experiences from the Dental Pipeline Program. *J Dent Educ* 2008; 72:1268-1276.

**Mitchell DA**, Borrell LN, Lassiter SL, Formicola AJ. The oral health status of adolescents in northern Manhattan. *J of Health Care for the Poor and Underserved* 2007; 18:814-832.

Price SS, Brunson WD, **Mitchell DA**, Alexander CJ, Jackson DL. Increasing the enrollment of underrepresented students: Experiences from the Dental Pipeline Program. *J Dent Educ* 2007; 71:339-347.

**Mitchell DA**, Lassiter SL. Addressing health care disparities and increasing workforce diversity: The next step for the medical, dental, and public health professions. *Am J Public Health* 2006; 96:2093-97.

Albert DA, McManus JM, **Mitchell DA**. Models for delivery of school-based dental care. *J School Health* 2005; 75:157-161.

**Mitchell DA**, Trinh CB, Ahluwalia KP, Albert DA, Findley SE, Marshall SE, Lamster IB, Formicola AJ. (2003) Dental caries experience in northern Manhattan adolescents. *J Public Health Dent* 2003; 63:189-94.

Albert DA, Findley S, **Mitchell DA**, Park K, McManus, J.M. Dental caries among disadvantaged 3-4 year old children in northern Manhattan. *Pediatr Dent* 2002; 24:229-33.

Formicola AJ, McIntosh JE, Marshall S, Albert DA, **Mitchell-Lewis DA**, Zalos GP, Garfield R. Population-based primary care and dental education: A new role for dental schools. *J Dent Ed* 1999; 63:331-338.

-----Expected time commitment: -----  
Summer: FULL TIME Fall or Spring: 5-8 HRS/WK

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Letty Moss-Salentijn, DDS, PhD  
E-mail: [lm23@columbia.edu](mailto:lm23@columbia.edu) Telephone: 305-5647/8834  
Title: Professor, Senior Associate Dean  
Dept/Div: Anatomy and Cell Biology and Dean's Office  
Location: P&S 12-541/ PH 7E-122

**Key words:** growth, development, skeletal, craniofacial dental tissues

**Research activities:** I use slides and specimens from existing collections for the analysis of craniofacial morphology and development, studied with computer-assisted 3-D reconstructions. I have place for one self-starter who requires minimal supervision to do this work.

**Selected references:**

Mehrnia K, **Moss-Salentijn L**, Serman J, and McAlarney M. (1998) *J. Dent. Res.* 77: Abstr 1510 (p. 294), IADR/AADR meeting 1998.

Yu S.-Y., McAlarney ME, **Moss-Salentijn L**. (1995) Form analysis of embryonic rat eye and midface growth. *J. Dent. Res.* 74: Abstr 427, IADR/AADR meeting 1995.

**Moss-Salentijn L**, Kember NF, Shinozuka M, Wu WF and Bose A. Computer simulations of chondrocytic clone behavior in rabbit growth plates. *J. Anat.*, 175:7-17, 1991

**Moss-Salentijn L:** The vacuature of the palatal processes during secondary palate development in the cat. In: Long Term Treatment in Cleft Lip and Palate with Coordinated Team Approach. (Kehrer, B, Slongo T, Graf, B and Bettex, M. eds) Hans Huber Verlag, Bern 1981. pp 58-72

-----Expected time commitment: -----

Summer: FULL TIME Fall or Spring: 5-8 HRS/WK

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David M. Owens, Ph.D.
 E-mail: do2112@columbia.edu Telephone: 851-4544
 Title: George Henry Fox Assistant Professor
 Dept/Div: Dermatology and Pathology
 Location: ICRC-321A

Key Words: squamous cell carcinoma, skin, stem cell, integrin, Rho GTPase, immune privilege, metastasis

Research Activities: Our overall focus is to determine the contributions of stem cells and differentiated cells to the development of epidermal squamous cancer. Specific areas of investigation include: i) identifying and characterizing subpopulations of clonogenic, multipotent epithelial progenitor cells in normal and neoplastic skin; ii) defining the mechanism of how aberrant expression of the $\alpha 6\beta 4$ integrin receptor can disrupt TGF- β mediated growth inhibition thereby altering the epidermal tumor microenvironment and stimulating tumor cell progression and metastasis; iii) defining the requirement for cell surface proteins that regulate immune tolerance in the metastasis and invasion of malignant epidermal keratinocytes.

[Link for more information on Dr. Owens' research.](http://156.111.235.11/pharm/cumc/profile.php?id=8)
<http://156.111.235.11/pharm/cumc/profile.php?id=8>

Selected References:

Jensen, UB, Yan, X, Triel C, Woo, S-H, Christensen R, and **Owens, DM**. A distinct population of clonogenic and multipotent murine follicular keratinocytes residing in the upper isthmus. *J. Cell Sci.* 121:609-617, 2008.

Yan, X and **Owens, DM**. The skin: a home to multiple classes of epithelial progenitor cells. *Stem Cell Rev.* 4:113-118, 2008.

Owens, D.M. and F.M. Watt. (2003) Contribution of stem cells and differentiated cells to epidermal tumours. *Nat. Rev. Cancer*, 3:444-451.

Owens, D.M., R.M. Romero, C. Gardner, and F.M. Watt. (2003) Suprabasal $\alpha 6\beta 4$ integrin expression in epidermis results in enhanced tumorigenesis and disruption of TGF β signaling. *J. Cell Sci.* 116: 3783-3791.

Arnott, CH, Scott, KA, Moore, RJ, Hewer A. Phillips, DH, Parker, P, Balkwill F, and **Owens, DM**. (2002) Tumor necrosis factor- α mediates tumour promotion via a PKC α - and AP-1-dependent pathway. *Oncogene*, 21:4728-38.

-----Expected time commitment: -----
 Summer: FULL TIME Fall or Spring: TBD

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Panos Papapanou, DDS, PhD
E-mail: pp192@columbia.edu Telephone: 305-9289
Title: Professor of Dental Medicine; Chair, Section of Oral and Diagnostic Sciences;
Director, Division of Periodontics
Dept/Div: Periodontics
Location: PH 7-East 110

Key words: periodontal disease, risk factors, oral infections, host responses, gene expression

Research activities: Epidemiology/risk factors for periodontal diseases; periodontal infections and systemic health, gene expression in periodontitis

[Link for more information on Dr. Papapanou's research.](#)

Selected references:

Demmer R, Behle JH, Wolf DL, Handfield M, Kerschull M, Celenti R, Pavlidis P, **Papapanou PN.** (2008) Transcriptomes in healthy and diseased gingival tissues. *Journal of periodontology* 79, epub ahead of print.

Kerschull M, Demmer J, Behle JH, Pollreis A, Heideman J, Belusko PB, Celenti R, Pavlidis P, **Papapanou PN,** (2008) Granulocyte chemotactic protein 2 (GCP-2/CXCL6) complements interleukin-8 in periodontal disease. *Journal of Periodontal Research*, October 7, epub ahead of print.

Papapanou PN, Sedaghatfar MH, Demmer R, Wolf DL, Yang J, Roth GA, Celenti R, Belusko PB, Lalla E, Pavlidis P. (2007) Periodontal therapy alters gene expression of peripheral blood monocytes. *Journal of Clinical Periodontology* 34:736-747.

Michalowicz BS, Hodges JS, DiAngelis A, Lupo, VR, Novak, MJ, Ferguson JE, Buchanan W, Bofill J, **Papapanou PN,** Mitchell DA, Matseoane S, Tschida PA. (2006) Treatment of periodontal disease and the risk of preterm birth. *New England Journal of Medicine* 355:1885-1894.

Desvarieux M, Demmer RT, Rundek T, Boden-Albala B, Jacobs DR, Sacco RL, **Papapanou PN.** (2005) Periodontal microbiota and carotid intima-media thickness: The Oral Infections and Vascular Disease Epidemiology Study (INVEST). *Circulation* 111:576-582.

-----Expected time commitment: -----

Summer: FULL TIME Fall or Spring: AT LEAST 1 FULL DAY/WK

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Srikala Raghavan, PhD  
Email: [sr2309@columbia.edu](mailto:sr2309@columbia.edu) Telephone: 342-1975 (lab)  
Title: Assistant Professor  
Dept/Div: Oral Surgery and Dermatology  
Location: VC12-230

**Key words:** Integrins, basement membrane, knockouts, cancer

**Research Activities:** In the skin and oral epithelia, cell migration and ECM assembly are central to many biological and pathological processes, including hair follicle morphogenesis, wound healing and metastatic cancers. Our long-term research goal is to understand how integrins, their ligands, and downstream signaling effectors regulate the process of cell migration and ECM assembly. Integrins are a large family of heterodimeric trans-membrane receptors, comprising  $\alpha\beta$  subunits that link the extracellular matrix (ECM) to the cellular cytoskeleton. Integrins signal through the cell membrane in a bi-directional manner. These signaling events regulate cellular processes such as cell adhesion, migration, proliferation, differentiation and apoptosis. Numerous studies have documented that abnormal integrin expression contributes to the pathogenesis of benign and neoplastic tumors underscoring the importance of these receptors both in normal and transformed cells. Since basal keratinocytes express a plethora of integrins, the use of both KO animals and cell culture models that mimic tissue architecture *in vivo* are critical to understanding the roles of individual integrins in these processes. The availability of the  $\alpha\beta1$  and  $\beta6$  KO animals and cells will allow us to assess the role of this and other compensatory integrins in these important cellular processes. By understanding the mechanisms by which individual integrin pairs are used by normal cells, we hope to gain insights into their contribution to pathological states such as cancer.

**Selected references:**

Landesberg R, Cozin M, Cremers S, Woo V, Kousteni S, Sinha S, Garrett-Sinha L, and **Raghavan S.** (2008). Inhibition of oral mucosal cell wound healing by Bisphosphonates. *Journal of Oral and Maxillofacial Surgery*, 66:839-847.

Schober M, **Raghavan S**, Nikolova M, Polak L, Pasolli HA, Beggs HE, Reichardt LF, Fuchs E. (2007). Focal adhesion kinase modulates tension signaling to control actin and focal adhesion dynamics. *Journal of Cell Biology*, 176(5): 667-80.

**Raghavan S**, Vaezi A, and Fuchs E. (2003). A role for  $\alpha\beta1$  integrins in focal adhesion function and polarized cytoskeletal dynamics. *Developmental Cell*, 5(3): 415-427.

-----Expected time commitment: -----  
Summer: FULL TIME Fall or Spring: 4-6 HRS/WK

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Ann Marie Schmidt, MD  
E-mail: [ams11@columbia.edu](mailto:ams11@columbia.edu) Telephone: 305-6406  
Title: Associate Professor  
Dept/Div: Surgery Location: P&S 17-501

**Key words:** diabetes, Alzheimer's disease, tumor biology, Receptor for AGE (RAGE), glycation, inflammation

**Research activities:** The laboratory is focused on the biology of RAGE. In diabetes, this centers on the development of murine models of diabetic complications. We hypothesize that the interaction of AGEs with RAGE is an important mediator of cellular perturbation and dysfunction. We thus study the role of soluble RAGE and RAGE-transgenic mice in diabetic complications. In Alzheimer's disease (AD), we discovered that RAGE is a neuronal/microglial receptor for amyloid- (peptide). We are developing strategies to test the hypothesis that RAGE contributes to neuronal dysfunction and cell death in AD by the development of RAGE-transgenic mice. In tumor biology we have discovered that RAGE is an adhesion molecule on the surface of tumors. We are studying its role in local tumor growth and metastasis. In inflammation, we have discovered that RAGE interacts with ENRAGE (Extracellular Novel RAGE binding protein) to activate endothelial cells, macrophages and lymphocytes. We have focused on this interaction in murine models of inflammation.

[Link for more information on Dr. Schmidt's work.](#)

**Selected references:**

- Hudson BI, Harja E, Moser B, **Schmidt AM.** (2005) Soluble levels of receptor for advanced glycation end products (sRAGE) and coronary artery disease: the nest C-reactive protein. *Arterioscler Thromb Vac Biol.* 25(5) 879-82.
- Rong LL, Yan SF, Wendt T, Hans D, Pachydaki S, Bucciarelli LG, Adebayo A, Qu W, Lu Y, Kostov K, Lalla E, Yan SD, Gooch C, Szablocs M, Trojaborg W, Hays AP, **Schmidt AM.** (2004) RAGE modulates peripheral nerve regeneration via recruitment of both inflammatory and axonal outgrowth pathways. *FASEB J.* 18(15): 1818-25.
- Giacona MB, Papapanou PN, Lamster IB, Rong LL, D'Agati VD, **Schmidt AM,** Lalla E. (2004) Porphyromonas gingivalis induces its uptake by human macrophages and promotes foam cell formation in vitro. *FEMS Microbiol Lett.* 241(1): 95-101.
- Hudson BI and **Schmidt AM.** (2004) RAGE; a novel target for drug intervention in diabetic vascular disease. *Pharm Res.* 21(7): 1079-86.

-----Expected time commitment: -----  
Summer: FULL TIME Fall or Spring: 8 HRS/WK

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Ulrike Schulze-Späte, DMD, PhD

E-mail: [us2141@columbia.edu](mailto:us2141@columbia.edu) Telephone: 212-304-5672

Title: Assistant Professor

Dept/Div: Periodontics

Location: PH-7-111

**Key words:** bone metabolism, inflammatory bone loss in osteopenic disease (e.g. periodontal disease), periodontal disease and systemic disease (chronic heart failure)

**Research Activities:** The bones of the skeleton are mineralized structures that also contain cells that regulate its structure and function. The two major types of cells are bone-forming cells (osteoblasts) and bone-resorbing cells (osteoclasts) that work in a dynamic equilibrium in all bones of the body throughout the lifetime of an individual. Balance is achieved by continuous remodeling of bone in response to growth, injury and aging. This highly sensitive biological system is dysregulated in pathological bone diseases where the balance between bone formation and resorption is disturbed with resulting bone weakening.

My research focuses on identifying pathomechanism associated with inflammatory bone loss and we investigate the transcriptional regulation of bone cells during their development and activity both in vivo and in vitro.

In addition, we study in a clinical setting the relationship inbetween local inflammatory periodontal disease and systemic metabolic conditions initiated by the failing heart.

**Selected references:**

**Schulze-Späte U**, Dietrich, T, Kayal, R, Hasturk, H, Dobeck J, Skobe, Z, Dibart, S. Systematic Analysis of Bone formation after Sinus Augmentation using Beta-Tricalcium Phosphate Comp Cont Ed Dentistry. In Press.

Montesani L, **Schulze-Späte U**, Dibart S. Sinus Augmentation using tissue-engineered bone. Intern J of Periodontics and Restorative Dentistry. In Press.

**Schulze-Späte U**, Battaglino R, Fu J, Sharma A, Joe M, Stashenko P. Brn3 Transcription Factors Control Terminal Osteoclastogenesis. J Cell Biochem. 2007 Sep 1;102(1):1-12 6.

Battaglino R, Joe M, **Schulze-Späte U**, Mueller, R, Stashenko P. Fluoxetine treatment increases trabecular bone formation in mice. J Cell Biochem. 2007 Apr 15; 100(6):1387-94.

Schulze PC, **Späte U**. Insulin-like growth factor-1 and muscle wasting in chronic heart failure. IJBCB.Oct; 37(10):2023-35.

-----Expected time commitment: -----

Summer: FULL TIME Fall or Spring: at least full 1 day/week

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Ying-Ju Sung, Ph.D  
E-mail: [yjs8@columbia.edu](mailto:yjs8@columbia.edu) Telephone: 212-305-5725  
Title: Clinical Assistant professor  
Dept/Div: Pathology and Cell Biology  
Location: BB1524 (up to 12/31/09)

**Key words: sensory neurons, signal transduction pathway, chronic pain, pain regulation**

**Research Activities:**

More than 20 million Americans suffer from persistent pain and far too many fail to obtain relief. Most pain depends on inputs from peripheral neurons. Thus, signals from the sites of injury or inflammation, which are ultimately perceived as painful, are first communicated by primary nociceptive neurons whose cell bodies reside in the periphery. Recent experiments have shown that these neurons undergo a phenotypic change in response to an injury/inflammation that results in a long-term hyperexcitability (LTH). The LTH amplifies signals from the lesion site to the CNS, thereby enhancing the perception of pain in response to normally innocuous stimuli. The LTH is associated with many chronic pain states, including osteoarthritis, colitis, cystitis, diabetes, and responds to a variety of other inflammatory events and injuries. We recently discovered that the induction of LTH requires the activation of a molecular cascade in the axon at the site of the injury or inflammation. The cascade culminates in the activation of protein kinase G1 $\alpha$  (PKG-1 $\alpha$ ), which is then transported to the cell body where it regulates the induction of the LTH. Inhibiting PKG-1 $\alpha$  activity blocks the LTH and attenuates thermal hyperalgesia in response to either nerve compression or inflammation. Consequently, we have begun a collaborative effort with medicinal chemists at Columbia University and computational chemists at Schrodinger, Inc to develop small compounds against active PKG. In addition, we are also in the process of addressing two important questions: how is PKG-1 $\alpha$  retrogradely transported to the soma from the periphery and how does PKG regulate LTH after nerve injury and inflammation?

**Selected references:**

- Sung, YJ** & Ambron, RT (2004) Pathways that elicit long-term changes in gene expression in nociceptive neurons following nerve injury: contributions to neuropathic pain. *Neurological Research* 26(2): 195-203.
- Sung, YJ**, Walters, ET & Ambron, RT (2004) A neuronal isoform of protein kinase G couples mitogen-activated protein kinase nuclear import to axotomy-induced long-term hyperexcitability *Aplysia* sensory neurons. *Journal of Neuroscience* 24(34):7583-7595.
- Sung, YJ** & Ambron, RT (2004) PolyADP-ribose polymerase-1 (PARP-1) and the evolution of learning and memory. *Bioessays* 26(12):1268-1271.
- Colby, GP, **Sung, YJ** & Ambron, RT (2005) mRNAs encoding the *Aplysia* homologues of fascilin-I and beta-thymosin are expressed only in the second phase of nerve injury and are differentially segregated in axons regenerating *in vitro* and *in vivo*. *J Neurosci Res.* 82(4):484-498
- Sung, YJ**, Chiu, DT & Ambron, RT (2006) Activation and retrograde transport of protein kinase in rat nociceptive neurons after nerve injury and inflammation. *Neuroscience* 141:697-709.
- Sung, YJ**, Wu, F, Schacher, S and Ambron, RT (2006) Synaptogenesis regulates axotomy-induced activation of c-Jun-activator protein-1 transcription. *Journal of Neuroscience* 26 (24) :6439-6449.

Alaedini, A, Xiang, Z, Kim, H, **Sung, YJ** and Latov, N. (2008) Up-regulation of apoptosis and regeneration genes in the dorsal root ganglia during cisplatin treatment. *Experimental Neurology* 210(2) 368-374.

-----Expected time commitment: -----

Summer: FULL TIME Fall or Spring: 4-6 HRS/WK

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Raymond I. Stark, MD
E-mail: ris2@columbia.edu Telephone: 305-0954
Title: Professor
Dept/Div: Pediatrics and Perinatology in Ob/Gyn
Location: P&S 3-340

Key words: Fetal and neonatal growth and neurodevelopment, pharmacology, electroencephalogram, toxicology/pharmacology of morphine, anti-HIV drugs, nicotine and SSRI's

Research activities: Studies address mechanisms of fetal growth regulation, neurobehavioral development and developmental pharmacology. Special emphasis is placed on the pharmacology and toxicology associated with fetal exposure to drugs of use and abuse. Structural and functional EEG studies evaluate developmental processes in infants born prematurely and infants at risk for SIDS, autism, and disorders of neurodevelopment.

Selected references:

Caspersen CS, Reznik B, Weldy PL, Abildskov KM, **Stark RI**, Garland M. Molecular cloning of the baboon UDP-glucuronosyltransferase 1A gene family: evolution of the primate UGT1 locus and relevance for models of human drug metabolism. *Pharmacogenet Genomics*. 2007 Jan;17(1):11-24.

Grieve PG, **Stark RI**, Isler JR, Housman SL, Fifer WP, Myers MM. Electrocortical functional connectivity in infancy: response to body tilt. *Pediatr Neurol*. 2007 Aug;37(2):91-8.

Isler JR, Grose-Fifer J, Fifer WP, Housman S, **Stark RI**, Grieve PG. Frequency domain analyses of neonatal flash VEP. *Pediatr Res*. 2007 Nov;62(5):581-5.

Liu F, Garland M, Duan Y, **Stark RI**, Xu D, Dong Z, Bansal R, Peterson BS, Kangarlu A. Study of the development of fetal baboon brain using magnetic resonance imaging at 3 Tesla. *Neuroimage*. 2008 Mar 1;40(1):148-59.

Garland M, Abildskov KM, Kiu TW, Daniel SS, Weldy P, **Stark RI**. Placental transfer and fetal elimination of morphine-3-beta-glucuronide in the pregnant baboon. *Drug Metab Dispos*. 2008 Sep;36(9):1859-68.

-----Expected time commitment: -----

Summer: FULL TIME Fall or Spring: 10-15 HRS/WK

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Lynn M. Tepper, EdD
E-mail: lm1@columbia.edu Telephone: 305-3126
Title: Clinical Professor
Dept/Div: Behavioral Science, CDM
Location: P&S 3-452

Key words: dental education, tobacco cessation, gerontology, geriatric dentistry, minority elderly, psychosocial aging

Research activities: Recruitment of minorities into geriatrics research, efficacy of tobacco cessation intervention approaches on middle aged and older people, development of virtual patients in dental education and health promotion.

Selected references:

Tepper, LM. (2008). Educating the Dental Profession. In Lamster and Northridge (Eds), *Improving Oral Health for the elderly: An Interdisciplinary Approach*. NY: Springer Pub Co.

Tepper, LM and Cassidy, TM. (2004). *Multidisciplinary Perspectives on Aging*. New York: Springer Pub Co.

Seidman DF. Albert D. Singer SR. Barrows RC Jr. **Tepper LM.** Ovalles M. Albin J. (2002) Serving underserved and hard-core smokers in a dental school setting. *J Dent. Educ.* 66(4): 507-13.

Tepper LM and Seidman, D. (1998) The Role of the Dental Profession in Tobacco Cessation, in D. Seidman and L. Covey (eds.) *Helping the Hard Core Smoker: A Clinicians Guide* NY: Lawrence Earlbaum.

Tepper LM (1997) Health Issues in Later Life, in Cassidy, T. *Elder Care*, NJ: NewHorizon Press.

Tepper LM and Gutheil IA. (1996) The Aging Family: Ethnic and Cultural Considerations, in Congress E (Ed), *Multicultural Perspectives in Working with Families*. NY: Fordam Press.

-----Expected time commitment: -----

Summer: NO COMMITMENT Fall or Spring: at least 3 HRS/WK

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Benjamin Tycko, MD, PhD  
E-mail: [bt12@columbia.edu](mailto:bt12@columbia.edu) Telephone: 851-5280  
Title: Professor  
Dept/Div: Pathology  
Location: ICRC 606

**Key words:** Genomic imprinting; Cancer genetics

**Research activities:**

Dr. Tycko's laboratory is pursuing several different lines of research focusing on 1) the epigenetics and genetics of Wilms tumors, acute myeloid leukemias, and other human cancers; 2) the identities and the physiological function of imprinted genes, and lastly 3) the genetic and epigenetic basis for phenotypes in Down syndrome. The laboratory also collaborates with others at Columbia to study the population genetics of Alzheimer's disease.

[Link for more information on Dr. Tycko's research.](#)

**Selected references:**

Kerkel K, Spadola A, Yuan E, Kosek J, Jiang L, Hod E, Li K, Murty VV, Schupf N, Vilain E, Morris M, Haghghi F, **Tycko B** (2008) Genomic surveys by methylation-sensitive SNP analysis identify sequence-dependent allele-specific DNA methylation. *Nat Genet* 40, 904-908.

Yuan E, Haghghi F, White S, Costa R, Chun K, McMinn J, Minden M, **Tycko B** (2006) A SNP chip method (MSNP) for combined genetic and epigenetic profiling: validation in Decitabine therapy and tumor/normal comparisons. *Cancer Res* 66, 3443-3451.

Moulton T, Crenshaw T, Hao Y, Moosikasuwan J, Lin N, Dembitzer F, Hensle T, Weiss L, McMorrow L, Loew T, Kraus W, Gerald W, **Tycko B** (1994) Epigenetic lesions at the H19 locus in Wilms' tumor patients. *Nature Genet* 7, 440-447.

Li C-M, Guo M, Borczuk A, Powell CA, Wei M, Thaker HM, Friedman R, Klein U, **Tycko B** (2002) Gene expression in Wilms tumors mimics the earliest committed stage in the metanephric mesenchymal-epithelial transition. *Am J Pathol*, 160, 2181-2190.

Li C-M, Kim CE, Margolin AA, Guo M, Zhu J, Mason JM, Hensle TW, Murty VVS, Grundy PE, Fearon ER, D'Agati V, Licht JD, **Tycko B** (2004) CTNNB1 mutations and over-expression of Wnt/beta-catenin target genes in WT1-mutant Wilms tumors. *Am J Pathol*, 165, 1943-1953.

Frank D, Fortino W, Clark L, Musalo R, Wang W, Saxena A, Li C-M, Reik W, Ludwig T, **Tycko B**. (2002) Placental overgrowth in mice lacking the imprinted gene *Ipl*. *Proc Natl Acad Sci*, 99, 7490-7495.

Salas M, John R, Saxena A, Barton S, Frank D, Fitzpatrick G, Higgins M, **Tycko B** (2004) Placental growth retardation due to loss of imprinting of *Phlda2*. *Mech Development*, 121, 1199-1210.

-----Expected time commitment: -----

Summer: FULL TIME Fall or Spring: 12 HRS/WK

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Gordana Vunjak-Novakovic, PhD
E-mail: gv2131@columbia.edu Telephone: 212-305-2304
Title: Professor
Dept/Div: Biomedical Engineering
Location: VC12-234

Key words: Tissue engineering, human stem cells, bioreactors, craniofacial regeneration

Research Activities: **Gordana Vunjak-Novakovic** is a Professor of Biomedical Engineering at Columbia University, where she directs the Laboratory for Stem Cells and Tissue Engineering (<http://www.bme.columbia.edu/gvnweb>), the Bioreactor Core of the NIH Tissue Engineering Resource Center, and the Stem Cell Imaging Core. Her lab is working on engineering human tissues, for use in regenerative medicine and advanced studies of human stem cells.

Link for more information on Dr. Vunjak-Novakovic's work.
<http://www.bme.columbia.edu/fac-bios/vunjak-novakovic/faculty/html>

Selected references:

Figallo E., Cannizzaro C, Gerecht-Nir S, Burdick J, Langer R, Elvassore N and **Vunjak-Novakovic G**. Micro-bioreactor array for controlling cellular microenvironments. *Lab on a Chip* 7:710–719, 2007. Cover article

Freytes D, Wan L and **Vunjak-Novakovic G**. Geometry and Force Control of Cell Function. Prospect article (invited editorial section) *Journal of Cellular Biochemistry* (in press)

Tandon N, Cannizzaro C, Chao P-hG, Marsano A, Maidhof R, Au H, Radisic M, and **Vunjak-Novakovic G**. Electrical field stimulation of cultured cells and tissues *Nature Protocols* 4:155-173, 2009.

Freed, L.E., Langer, R., Martin, I., Pellis, N., **Vunjak-Novakovic, G**. Tissue Engineering of Cartilage in Space, *PNAS* 94: 13885-13890, 1997; editorial in the same issue.

Grayson WL, Chao GP, Marolt D, Kaplan DL and **Vunjak-Novakovic G**. Engineering custom designed osteochondral tissue grafts. *Trends in Biotechnology* 26(4): 181-189 (2008)

Gerecht S, Burdick JA, Ferreira LS, Townsend SA, Langer R. and **Vunjak-Novakovic G**. Propagation of undifferentiated hESCs in hyaluronic acid hydrogels. *PNAS* 104:11298-303, 2007

Radisic M, Marsano A, Maidhof R, Wang Y and **Vunjak-Novakovic G**. Perfusion bioreactors for controlling cellular environments. *Nature Protocols* 3 (4): 719-738 (2008)

Grayson WG, Fröhlich M, Yeager K, Bhumiratana S, Cannizzaro C, Wan LQ, Chan ME, Liu ME, X. Edward Guo EX and **Vunjak-Novakovic GV**. Engineering anatomically shaped human bone grafts. *PNAS* 2009 Oct 9.

-----Expected time commitment: -----

Summer: FULL TIME Fall or Spring: 4-6 HRS/WK

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Athanasios I. Zavras, DMD, MS, DMSc  
E-mail: [az2256@columbia.edu](mailto:az2256@columbia.edu) Telephone: 212-342-0425  
Title: Associate Professor and Head  
Dept/Div: Oral Epidemiology & Biostatistics  
Location: 601 W 168<sup>th</sup> Street, Suite 34

**Key words:** Epidemiology, public health, oral cancer, population genetics, ONJ

**Research Activities:** Our research involves epidemiology, global public health, large database mining, and field study of populations and communities in order to i) identify what causes oral diseases such as dental caries, oral cancer and complex drug reactions such as osteonecrosis of the jaws, and ii) to develop innovative technologies, to be applied in the screening of asymptomatic subjects in order to diagnose disease at the earliest possible stage. Within this framework we welcome students with an interest in public health to conduct primary or secondary research, in New York or overseas. We currently have four main active research interests:

1. Project No. 1 focuses on gene - environment interactions in bisphosphonate-induced osteonecrosis of the jaw. Our aim is to create a genetic screening tool to test patients prior to initiating bisphosphonates.
2. Project No. 2 deals with risk assessment and oral cancer detection methods in community settings.
3. Project No. 3 explores the state of Dentistry in China.
4. Project No. 4 is an international project about cancer control in primary care.

**Selected references:**

**Zavras AI**, Pitiphat W, Lam A, Wu T, Cartos V, Douglass CW, Diehl SR. IGF2R-167 genotype increases the risk of oral squamous cell carcinoma in humans. *Cancer Research* 2003;63:296–297

Donnell A, Jin S, **Zavras AI**. Delay in Diagnosis of Oral Cancer. *J Stomatol Investig* 2009;2:15-26 available electronically at

[http://www.jsinv.org/files/donnell\\_et\\_al\\_vol2\\_15-26.pdf](http://www.jsinv.org/files/donnell_et_al_vol2_15-26.pdf)

Wessel JH, Dodson TB, **Zavras AI**. Zoledronate and other risk factors associated with osteonecrosis of the jaw in cancer patients: a case-control study. *J Oral Maxillofac Surg* 2008;Apr;66(4):625-31

Palaska PK, Cartos V, **Zavras AI**. Bisphosphonates and time to osteonecrosis development. *The Oncologist* 2009 (in press)

-----Expected time commitment: -----  
Summer: FULL TIME Fall or Spring: 4-6 HRS/WK

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John L. Zimmerman, DDS  
E-mail: [jlz4@columbia.edu](mailto:jlz4@columbia.edu) Telephone: 646-772-8607  
Title: Assistant Dean (Information Resources)  
Dept/Div: Oral and Diagnostic Sciences,  
College of Physicians and Surgeons Department of Biomedical Informatics  
Location: Armory 2<sup>nd</sup> Fl, CCNMTL

**Key words:** informatics, computer supported collaborative work, electronic patient records, distance learning

**Research activities:** My research focuses on clinical and educational applications in computer and information science, i.e., informatics. Issues of user interface, systems integrations, and collaborative environments for self-directed learning are being studied.

**Selected references:**  
Pai SS, Robinson M, **Zimmerman JL**. (2004) Protecting electronic health information as part of HIPAA. *Dentistry Today*. 23(10): 126-31.

**Zimmerman JL**. Defining biomedical informatics competency: the foundations of a profession. *Adv Dent Res*. 2003;17:25-8.

Kelsey R. **Zimmerman JL**. Online heart simulator for augmenting first-year medical and dental education. *Proc AMIA Symp*, 2002;370-374.

Abbey LM, **Zimmerman JL (eds)**. *Dental Informatics: Integrating Technology into the Dental Environment*, New York: Springer-Verlag; 1991.

-----Expected time commitment: -----  
Summer: FULL TIME Fall or Spring: 5-10 HRS/WK

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