
BIOGRAPHICAL SKETCH

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| NAME Petra E. Wilder-Smith | POSITION TITLE Associate Professor | | |
|---|---------------------------------------|---------|-------------------------|
| eRA COMMONS USER NAME (credential, e.g., agency login) pwsmith | | | |
| EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.) | | | |
| INSTITUTION AND LOCATION | DEGREE (if applicable) | MM/YY | FIELD OF STUDY |
| London University G.B. | BDS (Hons) | 06/1983 | Dentistry |
| Royal College of Surgeon of G.B. | LDSRCS | 07/1983 | Dental Surgery |
| Bern University, Switzerland | Dr. Med Dent | 11/1985 | Restorative Dentistry |
| Heidelberg University, Germany | Specialty | 11/1986 | Oral Medicine Specialty |
| Aachen University, Germany | Ph.D. | 12/1999 | Biomedical Optics |

A. Personal Statement

Dr Wilder-Smith is Associate Professor and Director of Dentistry at the University of California, Irvine's Beckman Laser Institute. She is a Fellow of the University of California, Irvine's Comprehensive Cancer Center, and visiting Professor at Aachen University and lecturer at Loma Linda University.

Professor Wilder-Smith's research interests include the use of non-invasive optical techniques such as fluorescence for oral diagnosis, especially the early detection and monitoring of oral pre-cancerous and cancerous changes. Her work in this field over the past 20 years has resulted in much collaboration and more than 70 publications. She serves on many advisory boards, including the Medical Advisory Board to *Cancer Research and Prevention Foundation*, the Board of the *American Society for Laser Medicine and Surgery*, as well as the editorial boards of the journals *Lasers in Surgery & Medicine* and *Journal of Biomedical Optics*. Wilder-Smith also served on the board of the Diagnostics Group, International Association for Dental Research and is currently President-Elect of this prestigious group.

B. Positions and Honors

Positions and Employment

- 1983 Assistant House Surgeon, Dept. of Oral Medicine and Immunology, Guys Hospital, London, U.K.
- 1983-84 Faculty, Dept. of Conservative, Preventive and Children's Dentistry, Bern University, Switzerland
- 1985-86 Senior House Officer, Edinburgh University Dental Hospital, Scotland, U.K.,
- 1986-90 Senior "Assistant" and Director of Research, Heidelberg University Dental School, Germany
- 1991-95 Assistant, Associate Director of Dental Program, Beckman Laser Institute, University of California, Irvine
- 1993- Lecturer, Dept. of Endodontics, Loma Linda University Dental School, CA
- 1995-99 Adj. Assistant Professor and Director of Dental Program, BLIMC, UCI, CA
- 1995- Research Affiliate, Cancer Center, NCI Research Center of Excellence
- 1998- Visiting Professor, Aachen University Dental School
- 1999-03 Adj. Assoc Professor and Director of Dental Program, Beckman Laser Institute, University of California, Irvine
- 2003- Associate Professor and Director of Dental Program, Beckman Laser Institute, University of California, Irvine

Honors

- Editorial Board Member: Journal of the European Society for Lasers in Oral Medicine 2001-
- Editorial Board Member: Lasers in Surgery & Medicine 1995-
- Medical Advisory Board to Cancer Research and Prevention Foundation (CRPF) 2006-
- Member of the Board, American Society for Lasers Medicine and Surgery 2005-
- Member-at-Large, Diagnostic Services Group, International Association for Dental Research 2005-06
- President-Elect, Diagnostic Services Group, International Association for Dental Research 2013-2014

Selected Peer-reviewed Publications (Selected from 81 peer-reviewed publications)

Most relevant to the current application

1. Ebihara A, Krasieva TB, Liaw LH, Fago S, Messadi D, Osann K, **Wilder-Smith P** (2003). Detection and diagnosis of oral cancer by light-induced fluorescence. *Lasers Surg Med.* 32(1):17-24.
2. Charoenbanpachon S, Krasieva T, Ebihara A, Osann K, **Wilder-Smith P** (2003). Acceleration of ALA-induced PpIX **fluorescence** development in the oral mucosa. *Lasers Surg Med.* 2003;32(3):185-8.
3. **Wilder-Smith P**, Osann K, Hanna N, El Abbadi N, Brenner M, Messadi D, Krasieva T (2004). In vivo multiphoton fluorescence imaging: a novel approach to oral malignancy. *Lasers Surg Med.* 35(2):96-103.
4. **Wilder-Smith P**, Lee K, Guo S, Zhang J, Osann K, Chen Z and Messadi D (2009). In-vivo Diagnosis of Oral Dysplasia and Malignancy Using Optical Coherence Tomography: Preliminary Studies in 50 Patients. *Lasers Surg. Med.* 41: 353-357. PMID 2862682
5. **Wilder-Smith P**, Krasieva T, Jung WG, Zhang J, Chen ZP, Osann K, Tromberg B (2005). Non-Invasive Imaging of Oral Premalignancy and Malignancy. Invited contribution to special edition: *J. Biomed. Optics* 10: 050601-1-8
6. Chang CJ, **Wilder-Smith P** (2005). Topical application of photofrin for photodynamic diagnosis of oral neoplasms. *Plast. Reconstr. Surg.* 115:1877-1886

Additional recent publications of importance to the field (in chronological order)

1. Hammer-Wilson MJ, Gray RM, **Wilder-Smith P**, Meister F, Osann K, Wilder-Smith CH. Fluorescence diagnostics of Helicobacter pylori-infected human gastric mucosa: establishing technique and validity. *Scand J Gastroenterol.* 2007 Aug;42(8):941-50.
2. Jung WG, Zhang J, Wang L, **Wilder-Smith P**, Chen Z, McCormick D, Tien NC (2005). Three-Dimensional Optical Coherence Tomography Employing a 2-Axis Microelectromechanical Scanning Mirror. *J. Biophotonics STQE.* 11: 806-810
3. Messadi DV, **Wilder-Smith P**, Wolinsky L (2009). Improving Oral Cancer Survival: The Role of Dental Providers. *Calif. Dental Assoc. Journal* 37: 789-798
4. Chung JR, Jung WG, Hammer-Wilson M, **Wilder-Smith P**, Chen Z (2007). Use of polar decomposition for the diagnosis of oral pre-cancer. *Appl. Opt.* 46: 3038-3045
5. **Wilder-Smith P**, Holtzman J, Epstein J, Le A (2010). Optical diagnosis in the oral cavity: an overview. *Oral Diseases*
6. Baek JH, Krasieva T, Tang S, Ahn Y, Kim CS, Vu D, Chen Z, **Wilder-Smith P** (2009). Optical Approach to the Salivary Pellicle. *J. Biomed. Opt.* 14: 044001
7. Kim CS, **Wilder-Smith P**, Ahn YC, Liaw LH, Chen Z (2009). Enhanced detection of early-stage oral cancer in vivo by optical coherence tomography using multimodal delivery of gold nanoparticles *J. Biomed. Opt.* 14: 034008

D. Research Support

Ongoing Research Support

Agency: National Institutes of Health R01 Co-PI (Wilder-Smith) 03/07/13-02/29/16

Award Number: DE022831

Title: "Low-cost non-invasive method to assess pulpal vitality

Goals: To develop a low-cost device for in vivo evaluation of pulpal vitality

Role: Co-PI

Agency: National Institutes of Health R03 PI (Wilder-Smith) 06/01/12-05/31/14

Title: A Low-Cost Simple Oral Cancer Screening Device for Low-Resource Settings

Award Number: EB014852

Goals: To develop a low-cost screening device for oral cancer for ambulatory health-care workers in India

Role: Principal Investigator

Agency: University of California Cancer Research Coordinating Committee PI (Wilder-Smith) 07/01/12-06/30/14

Title: Reversal of cancer-therapy-induced mucositis by human gingiva-derived mesenchymal stem cells

Goals: To investigate the use of GMES for prevention and treatment of cancer-therapy-induced GI mucositis

Role: Principal Investigator

Agency: Colgate Palmolive PI (Wilder-Smith) 12/1/09-12/31/13

Title: Clinical Research Study to Evaluate the Effects of Prototype Dentifrices on Soft-Tissue Architecture

Goals: To investigate the use of imaging for determining oral soft tissue health

Role: Principal Investigator

Agency: Air Force Office of Scientific Research PI (Berns) 11/15/13 –11/14/16

Award Number: FA9550-14-1-0034

Title: Advanced Optical Technologies for Defense Trauma and Critical Care

Project Title: Detecting in vivo the effects of smoke inhalation injury in the upper airway using a fiberoptic probe.

Goals: to investigate use of non-invasive imaging for detecting inhalation injury and treatment response

Role: Principal Investigator of this component of this multi-component center grant

Completed Research Support

Agency: National Institutes of Health R21 PI (White) 07/01/11-06/30/13

Title: Stress History is recorded in Tooth Enamel

Goals: To develop an imaging-based technique for measuring stress levels in the teeth as a reflection of past stressor events to the body

Role: Principal Investigator of the UCI subcontract

Agency: TATRICK-Department of Defense PI (Saggese) 01/01/08-12/31/11

Title: New Diagnostic and Treatment Technologies for Oral Health Care

Goals: to develop and validate multimodality spectroscopy and fluorescence for oral cancer diagnosis

Role: Principal Investigator subcontract for clinical trials

Agency: National Institutes of Health R25 PI (Messadi) 09/01/08-08/31/11

Title: Recruitment, Mentoring and Empowering the Next Generation of Academic Dentists"

Goals: To investigate interactions between BME and dental students, enhance curriculum and career choices

Role: Principal Investigator of the UCI subcontract

Agency: UCI School of Medicine Seed Grant. PI (Wilder-Smith) 4/10-3/12

Title: Mitigation of Cancer Therapy-Induced Mucositis by Mesenchymal Stem Cells

Goals: To determine whether GMSCs can mitigate oral mucositis induced by cancer therapies

Role: Principal Investigator

Agency: UCI Multi Investigator Faculty Res. Grant (CORCL) Co-PIs (Wilder-Smith, Chen. Kwon) 10/09-9/11

Title: Multimodal Theragnostics: Pinpointed and synergistic photohyperthermic and chemotherapy for early oral cancer using stimuli-transforming gold nanoparticles

Goals: To develop targeted nanoparticles for photohyperthermic and chemotherapy for early oral cancer

Role: Co-Principal Investigator

Agency: Air Force Office of Scientific Research PI (Berns) 01/01/08 –03/31/09

Title: Acute Inhalation Injury Diagnostics Using High Resolution Optical Technologies: Oral-Nasal Cavity 2

Goals: To assess imaging of the upper airway for diagnosis of inhalation injury in the entire airway.

Role: Principal Investigator of this component of this multi-component center grant

Agency: Lantis Laser Inc. PI (Wilder-Smith) 01/01/08-01/01/09

Title: Optical Coherence Tomography (OCT) For the Detection and Diagnosis of Occlusal Decay II

Goals: To evaluate the ability of OCT to detect caries

Role: Principal Investigator

Agency: GlaxoSmithKline

PI (Wilder-Smith)

10/02/06-03/30/07

Title: An Optical Approach to the Salivary Pellicle

Goals: To identify non-invasive imaging techniques to map and characterize the salivary pellicle

Role: Principal Investigator

Goals: To assess upper airway imaging of the upper airway as a means for diagnosis of inhalation injury in the entire airway.

Role: Principal Investigator of this component of this multi-component center grant

Agency: Lantis Laser Inc.

PI (Wilder-Smith)

03/01/08-08/31/08

Title: Optical Coherence Tomography (OCT) For the Detection and Diagnosis of Occlusal Decay II

Goals: To evaluate the ability of OCT to detect caries

Role: Principal Investigator

Agency: Zila Pharamaceuticals

PI (Wilder-Smith)

01/01/08-03/31/09

Title: PDT using TBO in an animal model

Goals: To investigate TBO as a photosensitizer in the oral cavity

Role: Principal Investigator