

BIOGRAPHICAL SKETCH

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NAME Daniel S Gareau	POSITION TITLE Postdoctoral Research Fellow, Dermatology & Biomedical Engineering		
eRA COMMONS USER NAME (credential, e.g., agency login) GAREAUD			
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
University of Vermont	B.S.	1999	Electrical Engineering
Oregon Grad. Inst. Of Science & Technology	M.S.	2002	Electrical Engineering
Oregon Health & Science University	Ph.D.	2006	Biomedical Engineering
Sloan Kettering Cancer Center	Post-doc	2008	Microscopy
Oregon Health & Science University	Post-doc	Present	Microscopy

A. Personal Statement

I develop novel approaches of confocal microscopy for biological applications, focusing on the detection of cancer and the monitoring of neural activity. I have developed five confocal configurations including dual a mode fluorescence/reflectance system, a line-scanning system and a system that incorporates a Raman spectrometer. Outside of confocal microscopy, I have developed Monte Carlo models of light transport in tissue and continue to work on diffuse spectroscopy for intra-operative monitoring of hemodynamics to guide surgery, and noninvasive molecular profiling.

B. Positions and Honors

1998-1999 Fiber Optic Technician, University of Vermont. Burlington, VT
1999-2000 Laboratory Teaching Assistant, University of Vermont. Burlington, VT
2000-2002 Research Assistant, Oregon Medical Laser Center. Portland, OR
2002-2005 PhD Student, Oregon Health & Science University. Portland, OR
2005-2008 Research Assistant (Postdoctoral). Sloan Kettering Cancer Center, New York, NY
2008-Current Research Assistant (Postdoctoral). Oregon Health & Science University. Portland, OR

- Student **Leadership** Award, Oregon Health & Science University 2005
- Student **Achievement** Award, OGI School of Science and Engineering 2005
- Cover of the British Journal of Dermatology Volume 160(6), 2009.
- Postdoctoral **Outstanding Paper of the Year** Award, Oregon Health & Science University, 2010
- Research **Innovation** Award, Oregon Clinical & Translational Research Institute, 2010
- Cover of the Journal of Biomedical Optics Volume 15(6), 2010.

C. Selected Peer-reviewed Publications

1. Gareau D.S., Bargo P.R., Horton W.A., Jacques S.L., Confocal fluorescence spectroscopy of subcutaneous cartilage expressing green fluorescent protein versus cutaneous collagen autofluorescence, Journal of Biomedical Optics, **9**:254-258, 2004.
2. Gareau D.S., Merlino G., Corless C., Kulesz-Martin M., Jacques S.L., Noninvasive imaging of melanoma with reflectance mode confocal scanning laser microscopy in a murine model, Journal of Investigative Dermatology **127**:2184-2190, 2007.
3. Patel Y., Gareau D.S., Nehal K., Rajadhyaksha M., Multimodal confocal mosaicing of basal cell carcinomas in Mohs surgical skin excisions, Journal of the American Academy of Dermatology, **56**(2):AB2, 2007.

4. Pan Y., Gareau D.S., Scope A., Rajadhyaksha M., Mulani A., Marghoob A., Polarized and nonpolarized dermoscopy, *Archives of Dermatology*, **44(6)**:828-829, 2008
5. Nehal K., Gareau D.S., Rajadhyaksha M., Skin Imaging With Reflectance Confocal Microscopy Seminars in Cutaneous Medicine and Surgery, **27**:37-43, 2008.
6. Gareau D.S., Li Y., Huang B., Eastman Z., Nehal K.S., Rajadhyaksha M., Confocal mosaicing microscopy in Mohs skin excisions: feasibility of rapid surgical pathology, *Journal of Biomedical Optics*, **13(5)**:054001, 2008.
7. Gareau D.S., Karen J.K., Dusza S.W., Tudisco M., Nehal K.S., Rajadhyaksha M., Sensitivity and specificity for detecting basal cell carcinomas in Mohs excisions with confocal fluorescence mosaicing microscopy, *Journal of Biomedical Optics*, **14(3)**:1-7, 2009.
8. Gareau D.S., The feasibility of digitally stained multimodal confocal mosaics to simulate histopathology, *Journal of Biomedical Optics*, **14(3)**:034050, 2009.
9. Karen J.K., Gareau D.S., Dusza S.W., Tudisco M., Rajadhyaksha M., Nehal K.S., Detection of basal cell carcinomas in Mohs excisions with fluorescence confocal mosaicing microscopy, *British Journal of Dermatology*, **160(6)**:1242-1250, 2009. Featured on Journal Cover.
10. Gareau D.S., Patel Y.G., Li Y., Aranda I., Halpern A.C., Nehal K.S., Rajadhyaksha M., Confocal mosaicing microscopy in skin excisions: a demonstration of rapid surgical pathology, *Journal of Microscopy*, **233(1)**:149-159, 2009.
11. Gareau D.S., Abeytunge S., Rajadhyaksha M., Line-scanning reflectance confocal microscopy of human skin: Comparison of full-pupil and divided-pupil configurations, *Optics Letters*, **34**:20, 2009.
12. Scope A., Mahmood U., Gareau D.S., Kenkre M., Lieb J.A., Nehal K., Rajadhyaksha M., *In vivo* reflectance confocal microscopy of shave biopsy wounds: feasibility of intraoperative mapping of cancer margins, *British Journal of Dermatology*, Volume 163, 1218-1228, 2010.
13. Gareau D.S., Hennessy R., Wan E., Pellacani G., Jacques S.L., Automated detection of malignant features by confocal microscopy on superficial spreading melanoma versus nevi, *Journal of Biomedical Optics*, **15(6)**, 061713 (2010). Featured on Journal Cover.
14. Gareau D.S., Truffer F., Perry K., Pham T., Enestvedt C.K., Dolan J., Hunter J.G., Jacques S.L., Optical fiber probe spectroscopy for laparoscopic monitoring of tissue perfusion during esophagectomies, *Journal of Biomedical Optics*, **15(6)**, 061712 (2010).
15. Pham T.H., Perry K.A., Enestvedt C.K., Gareau D.S., Dolan J.P. Sheppard B.C., Jacques S.L., Hunter J.G., Increased Gastric Conduit Ischemia as Measured by Optical Fiber Spectroscopy During Minimally Invasive Esophagectomy is Associated with Development of Anastomotic Complications, Submitted to *The Annals of Thoracic Surgery* MS ID#: ATS/2010/264309, 2010.
16. Qin J., An L., Gareau D.S., Hrebesh M.S., Wang R., *In Vivo* Imaging Microcirculations in Psoriasis of Human Skin Using Ultrahigh-Sensitive Optical Microangiography, *Lasers in Surgery and Medicine*, in press.
17. Gareau D., Automated identification of epidermal keratinocytes in reflectance confocal microscopy, *Journal of Biomedical Optics*, in press.

D. Research Support

Ongoing Research Support

5 T32 CA106195 Kulesz-Martin (PI) 5/1/2009-4/30/2011
NIH/NCI

"Training in Molecular Basis of Skin/Mucosa Pathobiology"
Percent effort and role on project: 100%; Trainee

Awarded May 2009 for the project "Confocal Microscopy for Cancer Imaging", this is a competitive post-doctoral fellowship, with possibility for renewal.

Medical Research Foundation of Oregon, Gareau (PI) 9/1/2010 – 8/30/2011
"Optical fiber probe spectroscopy for monitoring tissue hemodynamics"

The goal of this Early Clinical Investigator Award is to predict postoperative failure of surgically modified tissues. Dr. Gareau served as principal investigator.

Completed Research Support

R01 EB002715 Rajadhyaksha (PI) 8/1/2003-7/31/2008
NIH/NIBIB

" Intra-operative confocal imaging-guided Mohs surgery"

PI: Rajadhyaksha (PI)

The goal of this project is to provide rapid margin pathological assessment. Dr. Gareau developed the multimodal approach and contrast mechanisms.

R01 EB006947 Rajadhyaksa (PI) 8/1/2007-7/31/2010
NIH/NIBIB

" Confocal line-scanning versus point-scanning for imaging human skin *in vivo*"

PI: Rajadhyaksha (PI)

The goal of this project is to develop line-scanning confocal microscopy as a rapid & simple alternative to the point scanning confocal configuration. Dr. Gareau developed the full-pupil optical design for line-scanning.

R01 EB000224 Jacques (PI) 2000-2007
NIH

"Biomedical optics for medical research and clinical care"

The broad goal of this project is to advance tissue optics for medical science. Dr Gareau developed two theoretical simulations and 5 prototype clinical devices.