CURRICULUM VITAE

JULIA G. LYUBOVITSKY, PhD

PERSONAL INFORMATION

Citizenship: United States

Languages: English & Russian

Contact Info: E-mail: Julia.Lyubovitsky2016@gmail.com
Web-page: http://www.jlabspro.com

FORMAL EDUCATION

California Institute of Technology, Pasadena, CA
Division of Chemistry and Chemical Engineering
Ph.D.
Thesis Title: "Mapping the Cytochrome *c* Folding Landscape," Copyright 2003

New York University, New York, NY
Department of Chemistry
B. S. with Honors, *Magna Cum Laude*
Thesis Title: "Chemistry of benzene on the Si (100)-2×1 single crystal surfaces"

Moscow State Academy of Light Industry, Novosibirsk Branch, USSR
Department of Chemistry & Economics
Intermediate Diploma equivalent in Chemical Engineering

GRANTS AND ACADEMIC HONORS

2012	University of California BSAS Grant
2010	University of California Regents' Faculty Fellowship
2009	NSF BRIGE Grant
2009	NSF CAREER Award
2005	Finalist in the 2005 Burroughs Wellcome Fund "Career Award at the Scientific Interface" competition
2004	Mauna Kea Technologies Young Investigator Travel Award, Society of Molecular Imaging
2003	Hewitt Medical Fellowship, Beckman Laser Institute, UC Irvine
2000	NIH Traineeship, California Institute of Technology
1999	Dow Travel Award, California Institute of Technology
1997	NSF Graduate Fellowship Award
1996	NSF Undergraduate REU Fellow at University of Southern California
1996	George Granger Brown Award in Chemistry for Academic Excellence
1995	NSF Undergraduate Fellow at New York University

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1995 New York University College of Arts and Science Merit Scholarship

1995 Jewish Foundation for Education of Women Scholarship

1991 5-year free state-awarded higher education slot due to competitive performance on Chemical Engineering specialty entrance exams (Mathematics, Chemistry, Language/Literature Analysis)

1991 Top merit-based state-awarded monthly stipend (scores above 90% in Chemical Engineering courses)

A member of Phi Beta Kappa and Phi Lambda Upsilon Chemical Honor Society

PROFESSIONAL EXPERIENCE

2007 – Present **Founding Faculty Member / Head of Fundamental Research**
Department of Bioengineering, UC Riverside, CA

Research Interests: Self-assembly and new materials via its control; biosensing systems: materials & advanced bio-optical imaging technology

Research Areas: http://www.jlabspro.com/Research.html

2003 – 2007 **George E. Hewitt Medical Fellow /Postdoctoral**
Beckman Laser Institute & Medical Clinic, UC Irvine, CA

Research Area: Non-linear optical microscopy (NLOM) imaging of thick tissues

- Extended nonlinear optical microscopic (NLOM) methods to image the downstream effects of gene expression in close collaboration with investigators at the UC Irvine School of Medicine & Beckman Laser Institute Medical Clinic

- Supported NLOM component of the core Laser Microbeam and Microscopy (LAMMP) research activities

- Gained knowledge of tissue engineering and primary cell culture

- Mentored a diverse body of graduate and undergraduate students spanning physics, engineering and biology fields, generating project ideas and contributing expertise in chemistry and spectroscopy of proteins and laser-biological sample interactions

- Trained a diverse body of graduate students and medical fellows, providing technical support and project management in applications of NLOM to problems of biological and medical interest

- Composed an addendum to the Institutional Review Board (IRB) protocol and ICAC to conduct *in-vivo* imaging in genetically engineered mice that exhibited corneal abnormalities

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- Prepared annual reports summarizing core and all of the collaborative research projects of the NLOM imaging resource of LAMMP – a Biomedical Technology Center dedicated to extending optical technologies to biology and medicine

- Contributed technical content to a successful NIH NCRR Shared Instrumentation grant to acquire LSM510 multi-photon microscope ($500,000) for the shared optical instrumentation facilities and other collaborative grants at BLI

1997 – 2003 **Graduate Student Researcher**
California Institute of Technology (Caltech), Pasadena, CA

Research Area: Novel optical methods to trigger and to detect protein folding dynamics

Thesis Research: Developed an original, fluorescence-based method to examine the conformations of proteins as they acquired 3D states – mechanical designs, optical alignment, innovative signal detection and data processing schemes

- Performed both wet-lab and spectroscopy research, using methods including polymerase chain reaction (PCR) | protein expression and purification (E-coli and yeast) | chemical modification of proteins and separation of products by fast protein liquid chromatography (FPLC) | picosecond and nanosecond laser spectroscopy, Circular Dichroism (CD), UV-VIS, X-Ray Scattering, etc.

- Designed, build and provided technical support of optical systems, trained and assisted with experiments to many users with different research projects

Summer 1997 **Biomedical Engineer**
National Institutes of Health, Bethesda, MD.
NIH NCRR, Biomedical Engineering and Instrumentation Program

Research Area: Specific interactions of proteins and other biological macromolecules by Surface Plasmon Resonance (SPR)

Summer 1996 **NSF Undergraduate Research Fellow**
University of Southern California, Los Angeles, CA

Research Area: Molecular and macromolecular structures by X-ray Crystallography

1995 – 1997 **NSF Undergraduate Research Fellow/Assistant**
New York University, New York, NY

Research Area: *In situ* multiple internal reflection Fourier transform infrared (MIR-FTIR) spectroscopy and thermal programmed desorption of methyl and methylene radicals on Si(100)-2x1 single crystal surfaces

Other Relevant Employment

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Engineering Support Specialist
Research Institute of Complete Electric Drive, Novosibirsk, USSR
Mechanical, electrical/electronic components

Engineering Technologist (Data Storage, Automation & Quality Control)
Instrument and Device Manufacturing Plant, Novosibirsk, USSR
Military and civic optical devices

PROFESSIONAL SERVICE AND ACTIVITIES

Journal Review Service:

Journal of the American Chemical Society (JACS), Annals of Biomedical Engineering, Journal of Biomedical Optics, Acta Biomaterialia, Biomacromolecules, Investigative Ophthalmology & Visual Science, Analytical Methods, Processes, PLoS ONE, Scientific Reports, Colloids and Surfaces B: Biointerfaces, International Journal of Biological Macromolecules, Bioconjugate Chemistry, ACS Applied Materials & Interfaces

Professional Society Service:

2014	Chair, Biophotonics: Photonic Solutions for Better Health Care, Microscopy Session, *SPIE Photonics Europe*
2012	Chair, Advances in Bioanalytical Chemistry, Morning & Afternoon Sessions, *American Chemical Society Meeting (ACS)*
2010	Chair, Biomedical Imaging, *UC Wide Bioengineering Symposium, UC Davis*
2009	Co-Chair, Imaging Probe Development, *American Chemical Society Meeting (ACS)*
2008	Chair, Biomedical Imaging I & II, *UC Wide Bioengineering Symposium, UC Riverside*

Professional Society Affiliation:

- Member, American Chemical Society (ACS)
- Member, SPIE

National Panel Review Service:

2009 - 2017 **National Science Foundation (NSF)**
2009 - 2010 **National Institutes of Health (NIH)**

Institutional Service:

California Institute of Technology

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2001-2002 • Identify an opportunity, secure funding, organize and host Special Biophysical Chemistry seminars bringing together researchers working at the frontiers of Theoretical Polymer Physics, Chemistry and Biology

2001-2002 • Member, job fair organizing committee. Selected and communicated with companies that participated in the job fair

2002 • Assist in organizing a Gordon Research Conference on Protein Folding Dynamics

UC Irvine

2004 – 2007 • Participant, Laser Microbeam and Medical Program, External Advisory Board meeting: generate posters' contents to present collaborative work, set-up technology demos, etc.

• Compose reports, presentation slides, etc. outlining research activities of the microbeam and microscopy technology, non-liner optical microscopy (NLOM) resource

• Increase UC Irvine research community awareness about existing novel optical technologies and instrumentation to examine problems of biological interest

UC Riverside

2007 – 2016 • Member, Oral PhD Qualifying Exam Committees (Mechanical Engineering, Electrical Engineering, Cell Molecular and Developmental Biology Program, Chemistry)

• Wrote / modified / edited ALL standard operating procedures (SOPs) and safety guidelines relevant to laboratory experiments / hazardous substances / processes

• Determined the relevant section(s) of NIH guidelines, wrote / submitted / followed up and responded to questions from Institutional Biosafety Committee (IBC) for all relevant biological use authorization (BUA) research applications and/or amendments (BSL1 & BSL2 levels)

• Held primary responsibility for the laboratory safety - risk assessment, administrative & engineering controls (purchased / arranged appropriate personal protective equipment, maintained chemical and biohazardous materials' inventories and disposal, conduct staff training, reporting, auditing

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and meetings with EH&S, employ Laboratory Hazard Assessment Tool (LHAT*)* to manage compliance with laboratory safety, etc.)

- Brought recognition to UC Riverside by publishing research findings in disciplinary journals, giving pro bono invited lectures, seminars, co-authoring over 70 research presentations (including international)

2007 – 2011
- Member, Graduate Admissions Committee, Bioengineering Department

2007 – 2008
- Member, Development and Communications Committee, Bourns College of Engineering
- Member, Biomolecular Imaging Research Team (BIRT) Academic Coordinator Search Committee, Bioengineering Department
- Participant in Bioengineering Department efforts to establish Center of Bioengineering - presentation to Loma Linda investigators, assistance to BIRT Academic Coordinator, etc.
- Participant in meetings to discuss multiphoton imaging opportunities at UCR with Biomedical Sciences Department Faculty & UCR Microscopy Academic Coordinator

2007
- Member, Panel at the "Wow! That's Engineering!" event at UC Riverside
- Created, designed and developed a new undergraduate/graduate course: " *Biophotonics: Optical Microscopy & Biological Applications*," for students working in the fields that use optical measurements
- Participant, Bioengineering Advisory Board Meeting
- Participant in a Bioengineering Department hiring process that led to hiring five new Bioengineering Department faculty

2008 –2012
UCR Bioengineering department ABET certification preparation – course outlines, collection and processing of student responses, producing a book containing examples of student work for *Dynamics of Biological Systems* (BIEN159), *Biomedical Imaging* (BIEN160) and establishing faculty course assessment reports, meetings to prepare for and to obtain certification

2009
- Designed and developed a new bioengineering laboratory course: *Bioengineering Experimentation and Analysis*. The course was offered as a core PhD qualifying course for bioengineering graduate students.
- Visit to the offices of Senators Feinstein and Boxer to discuss STEM education issues (https://www.acs.org/content/acs/en/policy/memberadvocacy/planactivities/washington-office-visits.html)

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2009 – 2011	• Graduate Student Recruiter for the Bourns College of Engineering at local recruitment fairs for example Harvey Mudd, California Institute of Technology, UC Irvine
2009 – 2010	• Member, Faculty Search for Materials Science & Engineering and Bioengineering departmental searches • Communicated with EH&S, Bourns College, Chemical Engineering and Bioengineering Departments staff and made the recommendations regarding certification of Biohazardous Safety cabinets and CDC/NIH guidelines for biohazardous waste storage and disposal
2010	• Designed and developed a new undergraduate course: *Biomedical Imaging* • Re-designed an undergraduate course: *Dynamics of Biological Systems* • Panel member discussing "How to get an NSF CAREER grant" • Invited speaker at Bourns Space Science and Engineering Day event • Participant, Bioengineering Department undergraduate curriculum review
2011	• Invited participant at Bourns Space Science and Engineering Day event • Invited participant at Bioengineering Advisory Board Meeting
2012	• Invited participant at UC Riverside Women's Faculty Association Meeting • Invited participant at UC Riverside FORWARD Faculty Retreat
2012-2015	• Phi Betta Kappa Honor Society Induction Committee Member
2013	• Invited Panel member at panel sponsored by Women Resource Center • Participant, Bioengineering Department undergraduate curriculum review • Pro bono consultant to an office of research integrity, human research review board (HRRB) on a human subjects research proposal aimed to test the bioinstrument to determine if the data it collects correlates to seizure activity in patients at Loma Linda Medical Center • Composed an amendment to Institutional Animal Care and Use Committee (IACUC) to visualize burns in live rats with multiphoton microscopy (MPM) imaging / responded to questions • Participant, Bioengineering Advisory Board Meeting
2013-2016	• Faculty Welfare Committee, Academic Senate University of California
2014	• Invited Public lecturer at the UCR Retirees' and Emeriti Faculty Spring Luncheon • Invited technology presenter at the Center for Plant Cell Biology Annual Symposium
2014-2015	• Lecturer Search Committee, Bioengineering Department

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2015 • Research and Infrastructure Committee, Bourns College of Engineering

INVITED SEMINARS AND SCIENTIFIC PRESENTATIONS

2016

City of Hope Duarte - Comprehensive Cancer Center, Duarte, CA May 2016
Talk: "Optical Image Guided Validation Technologies: Non-invasive Assessment of Deep Tissue and Soft Biomaterials"

Cook Medical, Riverside, CA March 2016
Talk: "Minimally Invasive Optical Image Guided Validation Technologies: Soft Biomaterials and Deep Tissue Assessment"

MACOM, Riverside, CA January 2016
Talk & Imaging Demo: "Minimally Invasive Optical Image Guided Validation Technologies: Soft Biomaterials and Deep Tissue Assessment"

2015

9th International Mesostructured Materials Symposium, Brisbane, Australia, August 2015
Talk: "Collagen hydrogel preparation method and embryonic stem cell behavior"

SPIE , European Conferences on Biomedical Optics, Novel Biophotonics Techniques and Applications III, Munich, Germany**,** June 2015
Poster: "Second harmonic generation (SHG) and two-photon fluorescence (TPF) contrast imaging in biomaterial analysis"

SPIE Photonics West, BioSci., Imaging, Manipulation, and Analysis of Biomolecules, Cells, and Tissues, San Francisco, CA February 2015
Talk: "Second harmonic generation (SHG) imaging demonstrates a strong dependence of the structure of collagen hydrogel on the ion type and concentration"

2014

AVS PacSurf 2014, Biomaterial & Wet Interface Characterization, Kohala Coast, HI December 2014
Talk: "3D Collagen-Based Biomaterials Assembly: Novel Insights from Advanced Optical Characterization"

American Chemical Society Meeting (ACS), Spectroscopic and Imaging Methods in Interfacial Phenomena, San Francisco, CA August 2014
http://www.acs.org/content/acs/en/meetings/fall-2014.html
Talk:"Multiphoton microscopy optical imaging reveals many different structural features of fibrous collagen hydrogels *in situ*"

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15th UC Wide Bioengineering Symposium, **Biophotonics and Optical Imaging Systems**, UC Irvine, CA June 2014 http://sites.uci.edu/biosymposium/
Invited Talk: "Mapping *in situ* the microstructure within collagen systems"

AAAS Pacific Division's 95th Annual Meeting, UC Riverside, CA June 2014
http://ucrtoday.ucr.edu/23154
Invited Talk: "*In-situ* advanced optical spatiotemporal analysis of collagen systems"

Biochemistry graduate program, UC Riverside, Riverside, CA May 2014
Graduate Seminar: "Mapping *in situ* the microstructural features within collagen hydrogels"
Materials Research Society (MRS) Annual Meeting, San Francisco, CA April 2014
Poster: "Optical Spatiotemporal Characterization of Collagen Systems"

SPIE Photonics Europe, Multiphoton Microscopy - Biophotonics: Photonic Solutions for Better Health Care, Brussels, Belgium, April 2014 http://spie.org/x12290.xml
Invited Paper: "Collagen bioengineered systems: *in situ* advanced optical spatiotemporal analysis"

The UCR Retirees' and Emeriti Faculty Spring Luncheon, UCR, CA March 2014
http://retirees.ucr.edu/luncheon/spring-luncheon-2014.pdf
Invited Featured Luncheon Speaker: "Bioengineering imaging techniques: unveiling the secrets beneath the skin"

2013

CEPCEB Annual Symposium, UC Riverside Riverside, CA December 2013
Invited Technology Talk: "Multiphoton Optical Image Guided Spectroscopy for *in situ* Noninvasive Analysis of Thick Tissues"

University of California Riverside, Riverside, CA December 2013
Talk:" Proteins: mechanistic and structural studies using optical spectroscopy and imaging" *invited guest speaker in Intro to BioEngineering Class*

AVS 60th International Symposium and Exhibition, Evolving *In Situ* Microscopic and Spectroscopic Techniques and Applications, CA October 2013
Talk: "Changes to the microstructure of fibrous collagen hydrogels formed under different physicochemical parameters and upon cross-linking with non-toxic reagents are detected with *in situ* multiphoton microscopy Imaging"

Chaffey College, Rancho Cucamonga, CA October 2013
Talk: "Bioengineering and optical spectroscopy and imaging technologies"
Invited guest speaker in Intro to Engineering Class

Safariland, Riverside, CA July 2013
Talk: **"**Deep tissue microstructural analysis with multiphoton microscopy and novel optical contrast development"

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American Chemical Society Meeting (ACS), New Frontiers and Challenges in Biomaterials Analysis, New Orleans, LA April 2013
Talk:" Micro-structural characterization of fibrous collagen hydrogels by two-photon fluorescence (TPF) and second harmonic generation (SHG) imaging"

SPIE Photonics West, BioSci., Imaging, Manipulation, and Analysis of Biomolecules, Cells, and Tissues, San Francisco, CA February 2013
Poster: "Microscopic imaging of glyceraldehyde-induced tissue glycation with intrinsic second harmonic generation and two-photon fluorescence"

SPIE Photonics West, BioSci., Imaging, Manipulation, and Analysis of Biomolecules, Cells, and Tissues, San Francisco, CA February 2013
Poster: "The microstructure of collagen hydrogels has a very strong effect on differentiation of embryonic stem cells"

2012

Materials Research Society (MRS) Annual Meeting, Biomaterials, Boston, MA November 2012
Talk: "Embryonic Stem Cell Differentiation into a Neural Lineage upon Contact with Collagen 3D Hydrogels of Different Microstructure: Multi-photon Microscopy (MPM) Study

BMES, Atlanta, GA October 2012
Poster: "The Effects of Collagen Hydrogels on Embryonic Stem Cells Differentiating into the Neuronal Lineage"

Chaffey College, Rancho Cucamonga, CA October 2012
Talk: "Proteins: mechanistic and structural studies using optical spectroscopy and imaging," *invited guest speaker in Intro to Engineering Class*

American Chemical Society Meeting (ACS), San Diego, CA March 2012
Talk: "Multiscale and multimodality characterization of collagen hydrogels cross-linked with zero versus non-zero linkers"

Biophysical Society Meeting, San Diego, CA February 2012
Poster: "The effects of zero-length and non-zero length cross-linking reagents on the optical spectral properties and structures of collagen hydrogels"

SPIE Photonics West, BioSci., Imaging, Manipulation, and Analysis of Biomolecules, Cells, and Tissues, San Francisco, CA January 2012
Talk: "Effects of cross-linkers on optical spectral properties and nano/microstructure of collagen hydrogels"

2011

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Materials Research Society (MRS) Annual Meeting, Biomaterials, Boston, MA November 2011
Talk:" Effects of Different Length Cross-Linking Reagents on the Optical Spectral Properties and Structures of Collagen Hydrogels.

AIChE Annual Meeting, **Materials Engineering and Sciences Division, Biomaterial Scaffolds for Tissue Engineering I,** Minneapolis, MN October 2011
Talk:" Characterizing Collagen Hydrogels for Tissue Engineering Applications"

Chaffey College, Rancho Cucamonga, CA September 2011
Talk:" Mechanistic and structural properties of proteins studied by optical spectroscopy and imaging," *invited guest speaker in Intro to Engineering Class*

SPIE Photonics West, BioSci., Imaging, Manipulation, and Analysis of Biomolecules, Cells, and Tissues, San Francisco, CA January 2011
Talk: "Characterizing collagen-based materials modified by glycation: a multiphoton optical image guided spectroscopy method"

IGERT Seminar, UC Riverside, Riverside, CA January 2011
Invited Talk: "Natural Materials Design: Engineering Materials that Work"

2010

Beckman Laser Institute, LAMMP Seminar, UC Irvine, Irvine**,** CA, December 2010
Invited Talk: "Natural Materials Design: Engineering Materials that Work"

First Annual Meeting of Principal Investigators (PIs) in the National Science Foundation (NSF) Broadening Participation Research Initiation Grants (BRIGE) Program, Washington DC, August 2010
Poster: "Towards the *in-situ* analysis of the assembly of structural proteins by multi-photon optical image guided spectroscopy""

2009

American Chemical Society Meeting (ACS), Washington DC, August 2009
Talk: "Multiphoton optical microscopy characterization of fibrillar collagen I structural states"

Biophotonics seminar, UC San Diego, San Diego, CA 2009
Invited Seminar: "Structural and mechanistic studies of protein-based materials with optical microscopy and with imaging"

2008

Department of Chemistry, UC Riverside, Riverside, CA 2008
Invited Seminar: "Proteins: from molecules to tissues"

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American Chemical Society Meeting (ACS), Philadelphia, PA 2008
Invited Talk: "Understanding Cellular Responses: Multi-photon imaging of actin filament formation and mitochondrial energetics of ACBT gliomas"
Invited Talk: "Dermal Structural Assembly in normal and pathological connective tissues by intrinsic signal multi-photon microscopy"

9th Annual Bioengineering Symposium, UC Riverside**,** June 2008
Poster: "Understanding Cellular Responses: Multi-photon imaging of actin filament formation and mitochondrial energetics of ACBT gliomas"

SPIE Photonics West, BioSci., Imaging, Manipulation, and Analysis of Biomolecules, Cells, and Tissues
Invited Paper: "Characterization of dermal structural assembly in normal and pathological connective tissues by intrinsic signal multiphoton optical microscopy"

2007

Cell, molecular and developmental biology program, UC Riverside Riverside, CA 2007
Graduate Seminar: "Proteins: mechanistic and structural studies using optical spectroscopy and imaging"

Department of Biochemistry, mSTART, UC Riverside, Riverside, CA 2007
Graduate Seminar: "Proteins: mechanistic and structural studies using optical spectroscopy and imaging"

Spectra-Physics Division at Newport Corporation, Irvine, CA 2007
Talk: **"**Probing protein structures using optical spectroscopy and imaging: implications in disease, biomaterials and nanotechnology"

The Institute for Ultrafast Spectroscopy and Lasers at CUNY, New York, NY 2007
Talk: **"**Proteins: mechanistic and structural studies using optical spectroscopy and imaging"

8th UC Wide Bioengineering Symposium, San Francisco, CA 2007
Poster: "Probing protein structures using optical spectroscopy and imaging: implications in disease, biomaterials and nanotechnology"

Beckman Institute Laser Resource Center (BILRC) at Caltech, Pasadena**,** CA 2007
Talk: **"**Proteins: mechanistic and structural studies using optical spectroscopy and imaging"

Department of Bioengineering, External Board of Advisors Meeting, UC Riverside, CA, May 15 2007
Talk: "The BI Laboratory | Bio-Spectroscopy and Imaging at BioE/UCR"

Harrington Department of Bioengineering at Arizona State University, Tempe**,** AZ, April 19 2007

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Talk: **"**Proteins: mechanistic and structural studies using optical spectroscopy and imaging"

Biotechnology Institute/Center for Biosystems Research and Bioengineering Department at University of Maryland, Maryland, MD, March 25 2007
Talk: **"**Proteins: mechanistic and structural studies using optical spectroscopy and imaging"

Department of Bioengineering, Stanford Biodesign, Stanford BIOX at Stanford University, Stanford March 12 2007
Talk: **"**Proteins: mechanistic and structural studies using optical spectroscopy and imaging"

Department of Bioengineering at University of California Riverside, Riverside, CA
March 1 2007
Talk: **"**Developing optical tools to look at biological systems"

Laser Microbeam and Medical Program, External Advisory Board Meeting, Beckman Laser Institute, UC Irvine, Irvine, CA, January 2007
Poster: "Intrinsic reflectance multi-photon optical tomography of connective tissues in normal and genetically altered states"

2006

Minimally Invasive Surgical Technologies Institute, Cedars Sinai, Los Angeles, CA, December 15 2006
Talk: **"**Developing optical tools to look at biological systems"

Hewitt Medical Fellowship Symposium, Newport Beach, Newport, CA, December 1 2006
Talk: **"**Developing optical tools to look at biological systems"

American Chemical Society Meeting (ACS), San Francisco, CA, September 6 2006
Poster: "Optical imaging of mitochondrial bioenergetics"
Poster: "Visualizing pathologies in a transgenic mouse model using nonlinear microscopy"

Molecular Imaging, 5th Annual Meeting, Hawaii, HI, August 31 2006
Poster: "Intrinsic reflectance multi-photon optical tomography of connective tissues in normal and genetically altered states"

Department of Ophthalmology/UC Irvine, Orange, CA, May 15 2006
Talk: **"**Developing optical tools to look at biological systems"

2005

Laser Microbeam and Medical Program, External Advisory Board meeting, Beckman Laser Institute, UC Irvine, Irvine, CA, November 2005
Poster: "Optical imaging of mitochondrial bioenergetics"

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Burroughs Wellcome Fund "Career Award at the Scientific Interface" competition, Research Triangle Park, NC, October 9 2005
Talk: "Optical imaging of mitochondrial bioenergetics"

SPIE Photonics West, BioSci., Multi-photon microscopy, January 20 2005
Talk and invited paper: "Corneal damage revealed by endogenous cellular fluorescence and second harmonic signals from collagen"

2004

Laser Microbeam and Medical Program, External Advisory Board meeting, Beckman Laser Institute, UC Irvine, Irvine, CA November 2004
Poster: "Corneal damage revealed by endogenous cellular fluorescence and second harmonic signals from collagen"

Molecular Imaging, 3rd Annual Meeting, St. Louis, MO, Molecular Imaging 3, 241, 2004
Poster and Young Investigator Travel Award: "Intrinsic cellular fluorescence and second harmonic signals from collagen in corneal fibrosis"

Hewitt Medical Fellowship Symposium, Newport Beach, Newport, CA, 2004
Talk: **"**Nonlinear optical microscopy: keloid tumors treatment with a radiofrequency device"

2003

Beckman Laser Institute, University of California at Irvine, Irvine, CA, 2003
Talk: **"**Mapping the Cytochrome *c* Folding Landscape"

2002

Aerospace Corporation, Los Angeles, CA, June 20 2002
Talk: **"**Mapping the Cytochrome *c* Folding Landscape"

Gordon Research Conference, Protein Folding Dynamics, January 2002
Poster: "Mapping the Cytochrome *c* Folding Landscape"

2001

International Conference on Bioinorganic Chemistry (ICBIC), Florence, Italy, J. Inorg. Biochem. 86: (1) 322 2001
Poster: "Real-time folding dynamics of *S-cerevisiae* iso-1 cytochrome *c*"

American Chemical Society Meeting (ACS), San Diego, CA, Abstr. Pap. Am. Chem. S. 221: U718 Part 1 2001
Poster: "Protein folding probed by fluorescence decay kinetics"

2000

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American Chemical Society Meeting (ACS), San Francisco, CA, Abstr. Pap. Am. Chem. S. 219: U851 Part 1 2000
Poster: "Protein folding probed by fluorescence decay kinetics"

Brookhaven National Laboratory, Long Island, NY, 2000
Talk: "Cytochrome *c* folding probed by fluorescence"

1999

International Conference on Bioinorganic Chemistry (ICBIC), Minneapolis, USA, J. Inorg. Biochem. 74: (1) 216 1999
Poster: "Redox-triggered folding of ferrocytochrome *c* probed by fluorescence"

1998

Southern California Inorganic Photochemistry Conference, Catalina Island, CA, 1998
Talk: "Metal triggered folding of zinc-finger proteins."

1997

Undergraduate Research Conference, New York University, New York, NY, 1997
Talk: "Evidence for surface-mediated decomposition of benzene on the Si (100) surface at elevated temperatures"

1996

NSF REU Symposium, Department of Chemistry, University of Southern California, CA, 1996
Poster: "Purification and crystallization of the anticancer antibiotic Bleomycin"

SCIENTIFIC PRESENTATIONS BY MY STUDENTS AND TRAINEES

2015

Mary and Randolph T. Wedding Research Symposium, Riverside, CA September 2015
Talk: "The Effect of Genipin "Age" on Genipin Crosslinked Collagen (GCC) Hydrogel's Optical, Microstructural and Mechanical Properties," Xuye Lang, and Julia Lyubovitsky

SPIE Photonics West 2015, Multiphoton Microscopy, San Francisco, CA February 2015
Poster: "Degradation of modified collagen-based materials monitored with multiphoton microscopy imaging," Xuye Lang, Matthew Spousta and Julia Lyubovitsky

2014

27th Annual UC Riverside Biochemistry and Molecular Biology Research Symposium, Riverside, CA September 2014

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Talk: "Detecting the microstructure and degradation of collagen hydrogels prepared under different conditions by second Harmonic Generation (SHG) Microscopy" Xuye Lang and Julia G. Lyubovitsky

American Chemical Society Meeting (ACS), General Papers/New Concepts in Polymeric Materials, San Francisco August 2014
Talk:"Detecting the effect of ions on the microstructure formation of collagen hydrogel", Xuye Lang and Julia Lyubovitsky

15th UC Wide Bioengineering Symposium, Irvine, CA June 2014
Poster: "Exploring the spectral properties of genipin reagent and its reactions with collagen" Yu Jer Hwang, Xuye Lang, Anh Vu, Julia Lyubovitsky

15th UC Wide Bioengineering Symposium, Irvine, CA June 2014
Talk: **"**Evaluation of collagen hydrogel preparation method on embryonic stem cell behavior" Yu Jer Hwang, Xuye Lang, Matthew Spousta and Julia Lyubovitsky

15th UC Wide Bioengineering Symposium, Irvine, CA June 2014
Poster: "Fructation and Cross-linking of Collagen Hydrogels" Yu Jer Hwang, Xuye Lang, Joseph Granelli, Cassandra C. Turgman, Jackie Gigante and Julia G. Lyubovitsky

15th UC Wide Bioengineering Symposium, Irvine, CA June 2014
Talk: "Microstructural features of the collagen hydrogels prepared with different ions are revealed by second harmonic generation (SHG) imaging" Xuye Lang and Julia G. Lyubovitsky

2013

AVS 60th International Symposium and Exhibition, Biomolecules at Aqueous Interfaces Focus Topic, CA October 2013
Talk: "Probing the Effects of Different Ions on the Formation of Microstructure Within Collagen Hydrogels by Second Harmonic Generation (SHG) Microscopy" Xuye Lang and Julia Lyubovitsky

26th Annual UC Riverside Biochemistry and Molecular Biology Research Symposium (Best Poster Award)
Poster: "Probing the Effects of Different Ions on the Formation of Microstructure Within Collagen Hydrogels by Second Harmonic Generation (SHG) Microscopy" Xuye Lang and Julia Lyubovitsky

ACS Colloids and Surface Science Symposium, UC Riverside, CA 2013
Talk: "*In-situ* multi-photon microscopy characterization of the effect of ionic strength on collagen fiber formation within hydrogels" Xuye Lang, Julia Lyubovitsky

14th Annual UC Wide Bioengineering Symposium, San Diego, CA June 2013
Talk: "The research of microstructure of collagen hydrogel under different ionic strengths" Xuye Lang, Julia Lyubovitsky

2012

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Americal Chemical Society Meeting (ACS), San Diego CA March 2012
Talk: "Raman spectroscopy detects non-enzymatically induced cross-links within collagen hydrogels" Yu-Jer Hwang, Julia Lyubovitsky

Americal Chemical Society Meeting (ACS), San Diego CA March 2012
Poster**:** "Assembling collagen hydrogels in presence of copolymers," Joseph E. Granelli, Yu Jer Hwang, Julia G. Lyubovitsky

SPIE Photonics West, BioSci., Imaging, Manipulation, and Analysis of Biomolecules, Cells, and Tissues, San Francisco, CA January 2012
Poster: "Novel Florescent Scaffolds to Study Embryonic Stem Cell Behaviors," Cassandra Turgman, Jillian Larsen, Yu-Jer Hwang, Nicole zur Nieden and Julia Lyubovitsky

2011

ASM West Symposium on Biomaterials, Medical Devices and Tools: Challenges with Design, Fabrication and Testing, UC Irvine November 2011
(Best Poster Presentation Award)
Poster: "Characterizing the effect of genipin crosslinking on the optical properties and structures of collagen hydrogels," Yu-Jer Hwang, Tatiana B. Krasieva and Julia Lyubovitsky

ASM West Symposium on Biomaterials, Medical Devices and Tools: Challenges with Design, Fabrication and Testing, UC Irvine November 2011
Poster: "The effect of hyaluronic acid copolymer on the assembly kinetics and structures within collagen hydrogels," Joseph Granelli, Yu-Jer Hwang and Julia G. Lyubovitsky

NSF IGERT on Video Bioinformatics, Second Fall Retreat 2011, UCLA Conference Center, Lake Arrowhead CA October 2011
Poster: "Using Fluorescent Hydrogel Scaffolds for Stem Cell Culture," Jillian Larsen, Yu-jer Hwang, Nicole zur Nieden, Julia Lyubovitsky

12th Annual UC Wide Bioengineering Symposium, Santa Barbara, CA June 2011
Poster: "The effect of genipin crosslinking on the micro- and nano- structure of collagen hydrogels," Yu-Jer Hwang, Tatiana B. Krasieva and Julia Lyubovitsky

American Chemical Society Meeting (ACS), Anaheim, CA, Arpil 2011
Poster: "Multi-photon optical image guided spectroscopy for characterization of collagen materials modified by genipin," Yu-Jer Hwang and Julia Lyubovitsky

Glial-Neuronal Interactions Symposium, UC Riverside, January 2011
Poster: "Multi-photon optical imaging of actin filament formation and mitochondrial energetics in Human ACBT gliomas" Yu-Jer Hwang, Nomiki Kolettis, Miso Yang, Elizabeth R. Gillard, Edgar Sanchez, Chung-ho Sun, Bruce J. Tromberg, Tatiana B. Krasieva and Julia G. Lyubovitsky

2010

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11th Annual UC Wide Bioengineering Symposium, Davis, June 2010
Poster: "Multi-photon optical image guided spectroscopy for characterization of fibrillar collagen materials modified by glycation," Yu-Jer Hwang and Julia Lyubovitsky

11th Annual Cell, Molecular, and Developmental Biology Research Symposium UC Riverside, June 2010 **(Outstanding Research Presentation)**
Talk: "Multi-photon optical image guided spectroscopy for characterization of fibrillar collagen materials modified by glycation," Yu-Jer Hwang and Julia Lyubovitsky

American Chemical Society Meeting (ACS), San Francisco, CA, March 2010
Talk: "Multi-photon optical image guided spectroscopy for characterization of fibrillar collagen materials modified by glycation," Yu-Jer Hwang and Julia Lyubovitsky

American Chemical Society Meeting (ACS), San Francisco, CA, March 2010
Poster: "Multi-photon optical image guided analysis to characterize collagen and gelatin materials modified by glycation," Yu-Jer Hwang, Nomiki Kollettis and Julia Lyubovitsky

2009

10th Annual UC Wide Bioengineering Symposium, Merced, June 2009
Talk: "Multi-photon optical microscopy of actin filaments and mitochondrial bioenergetics of ACBT human grade IV glioblastoma cells migrating within 3-D collagen-based hydrogels," Miso Yang, Yu-Jer Hwang, Edgar Sanchez, Chung-ho Sun, Tatiana B. Krasieva, Bruce J. Tromberg and Julia Lyubovitsky

10th Annual UC Wide Bioengineering Symposium, Merced, June 2009
Talk: "Towards methodology to characterize fibrillar collagen assembled *in vitro* under different initial conditions," Yu-Jer Hwang and Julia Lyubovitsky

American Chemical Society Meeting (ACS), Salt lake City, UT, April 2009
Talk: "Collagen biomaterial assembly at different temperatures and initial concentrations," Yu-Jer Hwang and Julia Lyubovitsky

Southern California Society for Microscopy and Microanalysis Symposium, March 2009
Poster: "Multi-scale and multi-modality approach to characterize structural features of fibrillar collagen formed at different initial concentrations," Yu-Jer Hwang, Miso Yang and Julia Lyubovitsky

2008

American Chemical Society Meeting (ACS), Philadelphia, PA, August 2008
Talk: "Correlation of non-liner optical signals to collagen bioengineered models," Yu-Jer Hwang and Julia Lyubovitsky

9th Annual UC Wide Bioengineering Symposium, Riverside**,** June 2008

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Talk: "Correlation of non-liner optical signals to collagen bioengineered models," Yu-Jer Hwang and Julia Lyubovitsky

UC Riverside NSF BRITE Symposium, Riverside, CA August 2008
Talk: "Development of a photo-multiplier tube thermal cooling device," Yasmine Salas and Julia Lyubovitsky

AWARDS/GRANTS/FELLOWSHIPS OF MY STUDENTS AND TRAINEES

2009 Yu Yau, CCRAA Undergraduate Research Fellowship
2010 Yu-Jer Hwang, Outstanding Research Presentation, 11th Annual Cell, Molecular, and Developmental Biology Research Symposium
2010 Jillian Larsen, Alliance for Graduate Education and the Professoriate (AGEP) Fellowship
2011 Yu-Jer Hwang, Dissertation Award
2011 Jillian Larsen, NSF IGERT Fellowship
2011 Ana Quezada; CONACYT Fellowship
2011 Yu-Jer Hwang, Best Poster Presentation Winner, ASM West Symposium on Biomaterials, Medical Devices and Tools: Challenges with Design, Fabrication and Testing
2012 Casandra Turgman, HSI Undergraduate Research Fellowship
2012 Casandra Turgman, Integrated Optics for Undergraduates NSF Research Fellow, UC San Diego, CA
2013 Xuye Lang, Poster presentation Award, 26th Biochemistry and Molecular Biology Symposium
2014 Anh Vu, HSI Undergraduate Research Fellowship
2014 Xuye Lang, Randolph T. and Mary K. Wedding Travel Award to present a talk at the 248th American Chemical Society National Meeting
2014 Jackie Gigante, HSI-STEM: STEM Pathway Grant
2015 Xuye Lang, Randolph T. and Mary K. Wedding Travel Award to present a talk at the SPIE National Meeting
2015 Jackie Gigante, HSI-STEM: STEM Pathway Grant
2016 Jackie Gigante, HSI-STEM: STEM Pathway Grant & University Honors
2016 Xuye Lang, Dissertation Award

TEACHING HISTORY

Undergraduate Level Courses:

Course: **Experimental Techniques in Physical Chemistry** (lecture/laboratory course)
Role: **Laboratory Teaching Assistant**
Chemistry Department, New York University

Text: "Physical Chemistry: Methods, Techniques, and Experiments," by R. J. Sime

Introduction to the principles and practices of experimental methods widely used in analytical and research laboratories; Understanding of background physicochemical theory as well as capabilities and limitations of methods and data interpretations.

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Course: **General Chemistry I & II** (lecture/recitation course)
Role: **Recitation Teaching Assistant**
Chemistry Department, California Institute of Technology

Text #1: "Principles of Modern Chemistry," by D. W. Oxtoby, H. P. Gillis and A. Campion
Text #2: "Chemical Bonds: An Introduction to Atomic and Molecular Structure," by H. B. Gray

Introduction to the principles of chemistry. *First term*: electronic structure of atoms, periodic properties, ionic substances, covalent bonding, Lewis representations of molecules and ions, shapes of molecules, Lewis acids and bases, Bronsted acids and bases, hybridization and resonance, bonding in solids. *Second term*: chemical equilibria, oxidation and reduction, thermodynamics, kinetics, introduction to organic chemistry and the chemistry of life.

Course: **Engineering Optics for Medical Applications** (lecture/recitation course)
Role: **Two Guest Lectures on Optical Microscopy**
Beckman Laser Institute, UC Irvine

Fundamentals of optical systems design, integration, and analysis used in biomedical optics. Design components: light sources, lenses, mirrors, dispersion elements, optical fibers, detectors. Systems integration: microscopy, radiometry, interferometry. Optical system analysis: resolution, modulation transfer function, deconvolution, interference, tissue optics, noise.

Course: **Dynamics of Biological Systems** (lecture/recitation course)
Role: **Sole Instructor**
Bioengineering Department, UC Riverside

Text: "Basic Transport Phenomena in Biomedical Engineering," by R. L. Fournier

Introduction to dynamic and equilibrium processes in biological systems. Application of the principles learned to understanding advanced concepts related to dynamic processes in biological systems as relevant to design of bioreactors, bioassays, drug delivery systems and artificial tissues/organs.

Course: **Biomedical Imaging** (lecture/recitation, senior technical elective course)
Role: **Sole Instructor**
Bioengineering Department, UC Riverside

Text: "The Essential Physics of Medical Imaging," edited by J. T. Bushberg et al.

Introduction to the fundamental physics and engineering principles for biological and medical imaging systems. Imaging systems include optical (confocal, 2 photon, OCT and other emergent technologies), X-ray, radionuclide and MRI. Topics covered include light-matter interactions, image formation/reconstruction, image characteristics and quality, and image processing.

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Course: **Biomaterials** (lecture/recitation, junior required course)
Role: **Sole Instructor**
Bioengineering Department, UC Riverside

Text: "Biomaterial Science: An introduction to materials in medicine," edited by B. Ratner et al.

Introduction to the biomaterials. Properties of materials (bulk, surface, characterization). Types of materials used for biological and medical applications (polymers, silicon based materials, hydrogels, metals, ceramics, glasses, composites). Biomaterial interfaces (surface derivatization and surface-immobilized biomolecules). Interaction of materials with biological systems (cells, tissues, ECM), protein and cell adhesion, mechanical forces on cells and biological macromolecules

Course: **Directed Research/Technical Research Elective/Thesis** (Lab-based projects)
Role: **Sole Instructor**
Bioengineering Department, UC Riverside

- Examples of laboratory-based projects include:

  - **Novel Raman detection of water content** within the glyceraldehyde-modified collagen hydrogels

  - **Collagen self-assembly kinetics** in presence of glycosaminoglycan co-polymers

  - **Fructose cross-linking** of collagen protein

  - **Potential glioblastoma chemotherapy drugs** pimozide and risperidone and their effect on the formation of actin fibers in the 3D glioblastoma spheroid model

  - **Measurements of Ti:Sapph femtosecond pulses** by intensity autocorrelation

Course: **Special Studies** (literature-based research projects)
Role: **Sole Instructor**
Bioengineering Department, UC Riverside

- Example of a project supervised:

  - E**xperimental and computational methods to characterize the material properties of engineered tissues**: a comparative investigation

Course: **Undergraduate Senior Design** (design / laboratory course)
Role: **Contributing Instructor**

- Examples of projects supervised:

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- **Thermo-Modulating Microscope Stage Insert** – a Peltier-based device for the advanced analytical measurements

- **Point-of-Care Device Container** for transporting engineered living tissues

Graduate Level Courses:

Course: **Optical Microscopy and its Biological Applications** (lecture/recitation course)
Role: **Sole Instructor**
Bioengineering Department, UC Riverside

Introduction to the principles of optical system design, system integration and analysis in light microscopy; Design components: light sources, lenses, mirrors, dispersion elements, optical fibers, detectors; Optical system analysis: transfer functions, magnification, resolution, contrast; Molecular, cellular, organ, and organism applications and methods of data interpretations.

Course: **Bioengineering Experimentation and Analysis** (lecture/laboratory course)
Role: **Sole Instructor**
Bioengineering Department, UC Riverside

Introduction to the measurement principles, data acquisition and data interpretation methods in the interdisciplinary bioengineering laboratory. Addresses the fundamental mechanisms underlying the operation of sensors (surface plasmon resonance sensor), ECG (Biopack platform), design of a resistively heated microscope platform and an optical alignment of a laser-based system.

Course: **Special Topics in Biophotonics** (seminar course)
Role: **Sole Instructor**
Bioengineering Department, UC Riverside

Text: "Biomedical Photonics," edited by Tuan Vo-Dinh

Advanced science and technology methods using electromagnetic radiation for medical and biological applications. The course covers light-matter interactions, photonic devices and detection, imaging techniques, spectroscopy, diagnostics and mechanistic ideas on photodynamic therapy. This seminar followed readings of the selected chapters in Tuan Vo-Dinh Biomedical Photonics Handbook.

Course: **Direct studies** (seminar course)
Role: **Sole Instructor**
Bioengineering Department, UC Riverside

Image formation in the optical microscope, scanning microscopy (confocal & multiphoton), raman imaging, spectral imaging & fluorophores

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SCIENTIFIC PUBLICATIONS

[36] Xuye Lang, Matthew Spousta, Yu-Jer Hwang and **Julia G. Lyubovitsky**, "Noninvasive imaging of embryonic stem cell cultures by multiphoton microscopy reveals the significance of collagen hydrogel preparation parameters," *RSC Analytical Methods,* 8, 280-294 (2016)

[35] Xuye Lang and **Julia G. Lyubovitsky**, "Structural dependency of collagen fibers on ion types revealed by *in situ* second harmonic generation (SHG) imaging method**,**" *RSC Analytical Methods,* 7, 1680 – 1690 (2015) ***featured on the inside front cover* and *selected as a HOT ARTICLE***

[34] Nicole zur Nieden, Xuye Lang, Cassandra Turgman, Jillian Larsen, Joseph Granelli, Yu-Jer Hwang, **Julia G. Lyubovitsky**, "Fluorescent hydrogels as a potential scaffold for embryoid body formation and osteogenic differentiation of embryonic stem cells" *ACS Applied Materials and Interfaces*, 7, 10599–10605 (2015)

[33] Xuye Lang and **Julia G. Lyubovistky**, "Second harmonic generation (SHG) and two-photon fluorescence (TPF) contrast imaging in biomaterial analysis," Proc. SPIE 9540-36 (2015)

[32] Sandeep Dhall, Joao P. Silva, Y. Liu, Michael Hrynyk, Monika Garcia, A. Chan, **Julia Lyubovitsky**, Ronald J. Neufeld, Manuela Martins-Green, Release of insulin from PLGA-alginate dressing stimulates regenerative healing of burn wounds in rats, Clinical science, DOI: 10.1042/CS20150393 (2015)

[31] Xuye Lang, Matthew Spousta and Julia Lyubovitsky, "Detecting the collagen-based hydrogels degradation by Multiphonton Microscopy (MPM)" *Proc. SPIE* paper 9329-109, doi: 10.1117/12.2080559 (2015)

[30] Sandeep Dhall, Danh C. Do, Monika Garcia, Jane Kim, Seyed Mirebrahim, **Julia Lyubovitsky**, Stefano Lonardi, Eugene A. Nothnagel, Neal L. Schiller and Manuela Martins-Green "Generating and Reversing Chronic Wounds in Diabetic Mice by Manipulating Wound Redox Parameters," *Journal of Diabetes Research,* vol. 2014, Article ID 562625, 18 pages, doi:10.1155/2014/562625 (2014)

[29] Sandeep Dhall, Danh C. Do, Monika Garcia, Dayanjan Shanaka Wijesinghe, Angela P. Brandon, Jane Kim, Antonio Sanchez, **Julia Lyubovitsky**, Sean Gallagher, Eugene A Nothnagel, Charles E Chalfant, Rakesh P. Patel, Neal Schiller and Manuela Martins-Green, "A novel model of chronic wounds: Importance of redox imbalance and biofilm-forming bacteria for establishment of chronicity," *PLoS ONE,* 9:e109848 (2014)

[28] Yu Jer Hwang, Xuye Lang, Joseph Granelli, Cassandra C. Turgman, Jackie Gigante, **Julia G. Lyubovitsky**, "Collagen bioengineered systems: *In situ* advanced optical spatiotemporal analysis," *Proc. SPIE* 9129, 91291H, doi:10.1117/12.2052661(2014) ***Invited Paper***

[27] M. Martins-Green, M. Frankos, N. Adhami, M. Valdez, B. Goodwin, **J. Lyubovitsky**, S. Dhall, M. Garcia, I. Egiebor, B. Martinez, P. Jacob III, Havel, C., Yu, L., M. Curras-Collazo, "Cigarette smoke toxins deposited on surfaces: Implications for human health," *PLoS ONE* 9: e8639 (2014)

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[26] Yu-Jer Hwang and **Julia G. Lyubovitsky**, "Raman microspectroscopy of cross-linked three-dimensional collagen hydrogels," *Biopolymers* 99, 349-356 (2013)

[25] Yu Jer Hwang, Joseph Granelli, Manasa Tirumalasetty, **Julia G. Lyubovitsky**, "Microscopic imaging of glyceraldehyde-induced tissue glycation with intrinsic second harmonic generation and two-photon fluorescence contrasts," *Proc. SPIE* 8587, 858725 (2013), doi:10.1117/12.2012305

[24] Yu-Jer Hwang, Joseph Granelli and **Julia G. Lyubovitsky**, "The effects of zero- and non-zero length cross-linking reagents on the optical spectral properties and structures of collagen hydrogels," *ACS Applied Materials and Interfaces* 4, 261-267 (2012)

[23] Melissa L. Petreaca, Sandeep Dhall, Avo Serafino, Danh Do, Darcie McLelland, **Julia Lyubovitsky**, Neal Schiller, and Manuela M. Martins-Green, "Deletion of a Tumor Necrosis Superfamily Gene in Mice Leads to Impaired Healing that Mimics Venous Ulcers in Humans," *Wound Repair and Regeneration* 20, 353-366 (2012)

[22] Yu-Jer Hwang, Jillian Larsen, Tatiana B. Krasieva and **Julia G. Lyubovitsky**, "The effect of genipin crosslinking on the micro- and nano-structure of collagen hydrogels," *ACS Applied Materials and Interfaces* 3, 2579–2584 (2011)

[21] Yu-Jer Hwang, Joseph Granelli, Christina Flores and **Julia G. Lyubovitsky**, "Characterizing collagen-based materials modified by glycation: a multiphoton optical image guided spectroscopy method," *Proc. SPIE 7902, 7902I* (2011); doi:10.1117/12.877112

[20] Yu-Jer Hwang, Joseph Granelli and **Julia G. Lyubovitsky**, "Multiphoton Optical Image Guided Spectroscopy Method for Characterization of Collagen-Based Materials Modified by Glycation," *ACS Analytical Chemistry* 83 (1), 200–206 (2011)

[19] Yu-Jer Hwang and **Julia G. Lyubovitsky**, "Collagen hydrogel characterization: multi-scale and multi-modality approach," *RSC Analytical Methods* 3,529-536 (2011), ***featured on the inside front cover***

[18] Yu-Jer Hwang, Nomiki Kolletis, Miso Yang, Edgar Sanchez, Chung-ho Sun, Elizabeth R. Gillard, Bruce J. Tromberg, Tatiana B. Krasieva and **Julia G. Lyubovitsky**, "Multi-photon Imaging of Actin Filament Formation and Mitochondrial Energetics of Human ACBT Gliomas," *Photochemistry and Photobiology,* 87, 408-417 (2011)

[17] **Julia G. Lyubovitsky**, Xiaoman Xu, Chung-ho Sun, Bogi Andersen, Tatiana B. Krasieva, Bruce J. Tromberg, "Characterization of dermal structural assembly in normal and pathological connective tissues by intrinsic signal multiphoton optical microscopy," *Proc. SPIE* 6859, 1-9 (2008) ***Invited Paper***

[16] **Julia G. Lyubovitsky**, Xiaoman Xu, Tatiana B. Krasieva, Bogi Andersen, Bruce J. Tromberg, "*In situ* multi-photon optical tomography of hair follicles in mice," *J. Biomed. Opt. 12, 044003 (*2007*)*

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[15] Christopher B. Raub, Vinod Suresh, Tatiana Krasieva, **Julia Lyubovitsky**, Justin D. Mih, Andrew J. Putnam, Bruce J. Tromberg, Steven C. George, **"**Non-invasive assessment of collagen hydrogel microstructure and mechanics using multiphoton microscopy," *Biophys. J.* 92, 2212-2222 (2007)

[14] **Julia G. Lyubovitsky**, Tatiana B. Krasieva, Joel A. Spencer, Bogi Andersen, Bruce J. Tromberg, "Imaging corneal pathology in a transgenic mouse model using nonlinear microscopy," *J. Biomed. Opt.* 11, 014013 (2006)

[13] **Julia G. Lyubovitsky**, Tatiana B. Krasieva, Joel A. Spencer, Bogi Andersen, Bruce J. Tromberg, "Corneal damage revealed by endogenous cellular fluorescence and second harmonic signals from collagen," *Proc. SPIE* 5700, p. 213-217 (2005)

[12] Azin Meshkinpour, Peyman Ghasri, Karl Pope, **Julia G. Lyubovitsky**, Juha Risteli, Tatiana B. Krasieva, Kristen M. Kelly, "Treatment of Hypertrophic Scars and Keloids with a Radiofrequency Device: A Study of Collagen Effects," *Lasers in Surg. Med.* 37 (5): 343-349 (2005)

[11] **Julia G. Lyubovitsky**, Harry B. Gray, Jay R. Winkler "Conformations of Unfolded *S.cerevisiae* Cytochrome *c* Probed by Fluorescence Energy Transfer Kinetics," *Israel J. Chem.* 44, 263-269 (2004)

[10] **Julia G. Lyubovitsky, "**Mapping the Cytochrome *c* Folding Landscape," Thesis, copyright 2003

[9] Michele A. McGuirl, Jennifer C. Lee, **Julia G. Lyubovitsky**, Chalita Thanyakoop, Jhon H. Richards, Harry B. Gray, Jay R. Winkler, "Cloning, heterologous expression, and characterization of recombinant class II cytochromes *c* from *Rhodopseudomonas palustris,*" *BBA* 1619, 23-28 (2003)

[8] F. Akif Tezcan, William M. Findley, Brian R. Crane, Scott A. Ross, **Julia G. Lyubovitsky**, Harry B. Gray, Jay R. Winkler, "Employing Deeply Trapped Intermediates to Map Cytochrome *c* Folding Landscape," *Proc. Natl. Acad. Sci. USA* 99, 8626-8630 (2002)

[7] **Julia G. Lyubovitsky**, Harry B. Gray, Jay R. Winkler, "Structural Features of the Cytochrome *c* Molten Globule Revealed by Fluorescence Energy Transfer Kinetics," *J. Am Chem. Soc.*124, 14840-14841(2002)

[6] **Julia G. Lyubovitsky**, Harry B. Gray, Jay R. Winkler, "Mapping the Cytochrome *c* Folding Landscape," *J. Am Chem. Soc.*124, 5481-5485 (2002)

[5] Maynard J. Kong, Andrew V. Teplyakov, J. Jagmohan, **Julia G. Lyubovitsky**, C. Mui, Stacey F. Bent, "Interaction of C-6 cyclic hydrocarbons with Si(100)-2x1 surface: Adsorption and hydrogenation reactions," *J. Phys. Chem. B* 104: (14) 3000-3007 (2000)

[4] Maynard J. Kong, Andrew V. Teplyakov**, Julia G. Lyubovitsky**, Stacey F. Bent, "NEXAFS studies of adsorption of benzene on Si(100)-2x1," *Surf. Sci.* 411(3), 286-293 (1998)

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[3] **Julia G. Lyubovitsky** "Chemistry of benzene on the Si(100)-2x1 single crystal surfaces" Thesis, New York University, New York (**University Honors Thesis**) (1997)

[2] Maynard J. Kong, Szetsen S. Lee, **Julia Lyubovitsky**, and Stacey Bent, "Infrared Spectroscopy of Methyl Groups on Silicon," *Chemical Physics Letters* 263, 1-7 (1996)

[1] "AND THE HOUSE OF MY SPIRIT REMAINS SILENT," by **Julia G. Lyubovitsky** (*Mercer Street*, New York University, 1996-1997), pg. 12-14. This is an essay relating education with teaching philosophies and pedagogy. *Mercer Street* is a required course material within New York University Expository Writing Program.

MEDIA COVERAGE OF RESEARCH

RADIO/TELEVISION

Research featured and cited in Deepak Chopra's Lectures and Radio Show, October 2007

PRINT MEDIA COVERAGE

RSC Analytical Methods selected *Analytical Methods* 7, 1680 – 1690 (2015) featured on the inside front cover, January 2015

RSC Analytical Methods selected DOI: 10.1039/C4AY02242D as a ***Hot Article*** to feature on the *Analytical Methods* blog free of charge (http://blogs.rsc.org/ay/category/hot-article/), November 2014

IEEE Pulse magazine article "Engineering Excellence in Breakthrough Biomedical Technologies" June 2012

Virtual Issue of Analytical Chemistry selected *Analytical Chemistry 83 (1), 200–206* to serve as a representative example of "some of the most exciting advances now being made in Novel Optical Probes for Advanced Chemical Imaging," October 2011

RSC Analytical Methods selected *Analytical Methods* 3, 529-536 to be featured on the inside cover, March 2011

Virtual Journal of Biological Physics Research selected *J. Biomed. Opt. 12, 044003* to represent the "focused area of frontier research on biological physics," September 2007

Caltech Engineering & Science Magazine article "Misfolded Proteins and Parkinson's Disease," by Jay R. Winkler, Volume LXVIII, Number 3, 2005

Nature-Science News article "Proteins are open to big challenges," by Philip Ball, May 2002

Economist article "Protein folding – Moving Pictures," June 2002