ELIZABETH VARGIS, PhD

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Professional Experience

Associate Professor 2020 - present
Department of Biological Engineering, Utah State University, Logan, UT

Affiliate Faculty Member 2014 - 2020
Synthetic Biomanufacturing Center, Utah State University, Logan, UT

Assistant Professor 2013 - 2020
Department of Biological Engineering, Utah State University, Logan, UT

Postdoctoral Research Associate 2012 - 2013
Joint Institute for Biological Sciences, University of Tennessee, Knoxville, TN;
Center for Nanophase Materials Sciences, Oak Ridge National Lab, Oak Ridge, TN

Research Assistant 2003 - 2005
Life Science Division, Lawrence Berkeley National Lab, Berkeley, CA

Education

PhD, Biomedical Engineering 2012
Vanderbilt University, Nashville, Tennessee

Graduate Teaching Certificate 2011
Teaching-as-Research Fellow, Vanderbilt University, Nashville, Tennessee

MS, Biomedical Engineering 2007
Vanderbilt University, Nashville, Tennessee

BS, Bioengineering 2004
University of California, Berkeley, Berkeley, California

Research Grants, Awards, and Fellowships

Utah State University Research Catalyst Award (Co-PI, $20,000) 2020
Enhancing Antiviral Efficacy through Co-administration with Bio-active Excipients

BrightFocus Foundation Macular Degeneration Research Award (PI, $200,000) 2019 - 2021
An integrated microfluidic model of subretinal tissue to study age-related macular degeneration

National Institutes of Health – National Eye Institute Academic Research Enhancement Award, NIH (PI, $420,715) 2019 - 2022
Generating models of RPE disease to elucidate relationships between intercellular junctions and angiogenic factors

Outstanding Researcher, Department of Biological Engineering, Utah State University 2018, 2019

Department of Energy Scientific Infrastructure Support for Consolidated Innovative Nuclear Research (Co-PI, $300,000) 2018
Focused Ion Beam for Advanced Specimen Preparation, 3D Microstructural Characterization, and Simulated Irradiation

Utah NASA Space Grant Consortium Research Infrastructure Award (PI, $24,458) 2017 - 2018
Simulating the Space Radiation Environment on Human Cardiac and Skeletal Muscle

Department of Energy Nuclear Regulatory Commission (Co-PI, $312,145) 2016 - 2019
Faculty Development Program to Integrate New Faculty in Nuclear Engineering Research at Utah State University

Utah NASA Space Grant Consortium Graduate Fellowship (PI, $30,000) 2015; 2016

Utah State University Library's Open Access Funding Initiative (PI, $1500) 2015
Support for Publication in the Journal of Biological Engineering

Utah State University Research Catalyst Award (Co-PI, $20,000) 2015
Polymer Encapsulated Flavonoids and Zinc Flavonolate Complexes as Antiviral Antioxidants to CMV Infectivity and Associated Oxidative Damage

Oak Ridge Associated Universities (ORAU) Ralph E. Powe Junior Faculty Enhancement Award (PI, $20,000) 2015
Examining the Role of Spatial Organization on Retinal Degeneration

Knights Templar Eye Foundation Career Starter Grant (PI, $59,665) 2015
Examining Retinal Vascularization in Pediatric Diseases by Controlling in vitro Cell Growth

Utah State University Synthetic Biomanufacturing Institute (PI, $40,000) 2014
Seed Grant for Mammalian Cell Biomanufacturing Efforts

Utah State University Research Catalyst Award (PI, $20,000) 2014
Targeted, Surface-Enhanced Raman Spectroscopy Nanotags for Detecting B-Cell Lymphoma

Lai Sulin Scholarship for Research in Women's Cancer (PI, $5000) 2012

Vanderbilt University Dissertation Enhancement Grant (PI, $2000) 2010

Vanderbilt Institute for Clinical and Translational Research Grant (PI, $5000) 2010

NIH Ruth L. Kirschstein National Research Service Predoctoral Fellowship ($60K/year) 2006 - 2009

Newport Spectra-Physics Research Excellence Award 2009

Center for the Integration of Research, Teaching, and Learning (CIRTL) - Teaching as Research Award (PI, $3000) 2009

National Science Foundation Graduate Research Fellowship, Honorable Mention 2006

Vanderbilt Institute of Integrative Biosystem Research and Education (VIIBRE) Fellowship (PI, $25,000) 2005

Publications

(⁺corresponding author; *graduate / **undergraduate student in Vargis Lab; ‡equal contribution)

Journal (Peer-Reviewed)

Farjood F*, Ahmadpour A, Ostvar S, E Vargis⁺. Acute Mechanical Stress in Primary RPE Cells Induces Angiogenic Factor Expression and In Vitro Angiogenesis. *Journal of Biological Engineering* 15: (1), 1-9, 2020

Hanson C*, Bishop MM**, Barney JT**, and E Vargis⁺. Effect of growth media and phase on Raman spectra and discrimination of mycobacteria. *Journal of Biophotonics* 12: (11), e201900150, 2019

Harris T, Paterson C**, Farjood F*, Wadsworth I**, Caldwell L*, Lewis R, Jones J⁺, and E Vargis⁺. Utilizing Recombinant Spider Silk Proteins to Develop a Synthetic Bruch's Membrane for Modeling the Retinal Pigment Epithelium. *ACS Biomaterials Science & Engineering* 5: (8), 4023-4029, 2019

Hanson C*, Barney JT**, Bishop MM**, and E Vargis[+]. Simultaneous isolation and label-free identification of bacteria using cDEP and Raman spectroscopy. *Electrophoresis: Dielectrophoresis Special Issue* 40: (10), 1446-1456, 2019 – **Invited Submission**

Harding CP* and E Vargis[+]. An *in vitro* microgravity model for inducing key *in vivo* muscle atrophy markers. *BioMed Research International* Article ID 2042808, 12 pages, doi.org/10.1155/2019/2042808, 2019

Farjood F* and E Vargis[+]. Novel Devices for Studying Acute and Chronic Mechanical Stress in Retinal Pigment Epithelial Cells. *Lab on a Chip* 18: 3413-3424, 2018 – **HOT article** (top 10% of papers published in *Lab on a Chip*, based on peer-review scores)

O'Brien CM,[‡] Vargis E,[‡] Rudin A, Slaughter JC, Herington JL, Newton JM, Reese J, Bennett KA, A Mahadevan Jansen[+]. *In vivo* Raman spectroscopy for biochemical monitoring of the cervix throughout pregnancy. *American Journal of Obstetrics & Gynecology* 218: (5), 528.e1-528e18, 2018

Bani-Baker Q, Podgorski GJ, Vargis E, NS Flann[+]. A Computational Study of VEGF Production by Patterned Retinal Epithelial Cell Colonies as a Model for Neovascular Macular Degeneration. *Journal of Biological Engineering* 11: (1), 26, 2017

Farjood F* and E. Vargis[+]. Physical Disruption of Cell-Cell Contact Induces VEGF Expression in RPE Cells. *Molecular Vision* 23: 431-446, 2017

Davis D, Doloman A, Podgorski GJ, Vargis E, NS Flann[+]. Exploiting Self-Organization in Bioengineered Systems: A Computational Approach. *Frontiers in Bioengineering and Biotechnology*, 5: (27), 2017

Hanson C* and E Vargis[+]. Alternative cDEP Design to Facilitate Cell Isolation for Identification by Raman Spectroscopy. *Sensors*, 17: (2), 327-335, 2017 – **Invited Submission**

Hanson C*, Sieverts M**, E Vargis[+]. Effect of PCA centering and scaling on classification of mycobacteria from Raman spectra. *Applied Spectroscopy*, 71: (6), 1249-1255, 2016

Hanson C*, Israelsen ND*, Sieverts M**, E Vargis[+]. Fabricating a UV-Vis and Raman Spectroscopy Immunoassay Platform. *Journal of Visualized Experiments* 117: e54795, doi:10.3791/54795, 2016

Fronk AH* and E Vargis[+]. Methods for culturing retinal pigment epithelial cells *in vitro*: current protocols and future recommendations. *Journal of Tissue Engineering*, 7: 1-23, 2016

Israelsen ND*, Wooley D**, Hanson C*, E Vargis[+]. Rational Design of a Surface-Enhanced Raman Scattering Immunoassay for Detecting Biomarkers on a Polystyrene Substrate. *Journal of Biological Engineering*, 10: (2), 2016

Li Q, Xiao L, Harihar S, Welch D, Vargis E, A Zhou[+]. *In vitro* evaluation of the role of Breast Cancer Metastasis Suppressor 1 (BRMS1) in breast cancer cells to chemotherapy using a multimodal approach. *Analytical Methods*, 7: 10162-10169, 2015

Israelsen ND*[‡], Hanson C*[‡], E Vargis[+]. Nanoparticle Properties and Synthesis Effects on Surface-Enhanced Raman Scattering (SERS) Enhancement Factor: an Introduction. *Scientific World Journal*, 2015: 12 pages, Article ID 124582, 2015 – **Invited Submission**

O'Brien CM[‡], Vargis E[‡], Paria BC, Bennett KA, Mahadevan-Jansen A, J Reese[+]. Raman Spectroscopy Provides a Noninvasive Approach for Determining Biochemical Composition of the Pregnant Cervix In Vivo. *Acta Paediatrica*, 103: (7), 715-721, 2014

Vargis E, Peterson CB, Morrell-Falvey J, Retterer ST[+], CP Collier[+]. The Effect of Retinal Pigment Epithelial Cell Patch Size on Growth Factor Expression. *Biomaterials*, 35: (13), 3999-4004, 2014

Pence IJ, Vargis E, A Mahadevan-Jansen[+]. Assessing Variability of In Vivo Tissue Raman Spectra. *Applied Spectroscopy*, 67: (7), 789-800, 2013

Vargis E, Brown N, Williams KC, Paria BC, Al-Hendy A, Reese J, A Mahadevan-Jansen[+]. Detecting Biochemical Changes that Occur in the Rodent Cervix during Pregnancy using Raman Spectroscopy. *Annals of Biomedical Engineering*, 40: (8), 1814-1824, 2012

Vargis E, Tang Y-W, Khabele D, A Mahadevan-Jansen[+]. Near-Infrared Raman Microspectroscopy Detects High-Risk Human Papillomaviruses. *Translational Oncology*, 5: (3), 172-179, 2012

Vargis E, Byrd T, Logan Q, Khabele D, A Mahadevan-Jansen[+]. Sensitivity of Raman Spectroscopy to Normal Patient Variability. *Journal of Biomedical Optics*, 16: (11), 117004-1-9, 2011

Keller MD, Vargis E, Granja ND, Robert TH, Mycek MA, Kelley MC, A Mahadevan-Jansen[+]. Development of a Spatially Offset Raman Spectroscopy Probe for Breast Tumor Surgical Margin Evaluation. *Journal of Biomedical Optics*, 16: (7), 077006-1-8, 2011

Vargis E, Kanter EM, Majumder S, Keller MD, Beaven RB, Rao GG, A Mahadevan-Jansen[+]. Effect of Normal Variations on Classification of Raman Spectra of Cervical Tissue. *Analyst*, 136: (14), 2981-2987, 2011

Perez JW, Vargis E, Russ PK, Haselton FR, DW Wright[+]. Detection of Respiratory Syncytial Virus Using Nanoparticle Amplified Immuno-PCR. *Analytical Biochemistry*, 410: (1), 141-148, 2011

Kanter EM, Vargis E, Majumder S, Keller MD, Beaven RB, Rao GG, A Mahadevan-Jansen[+]. Application of Raman spectroscopy for Cervical Dysplasia Diagnosis. *Journal of Biophotonics*, 2: (1-2), 81-90, 2009

Kanter EM, Majumder S, Vargis E, Robichaux-Viehoever A, Kanter G, Shappell H, III Jones H, A Mahadevan-Jansen[+]. Multiclass Discrimination of Cervical Precancers using Raman Spectroscopy. *Journal of Raman Spectroscopy*, 40: (2), 205-211, 2009

Shyamala G[+], Chou Y-C, Cardiff RD, E Vargis. Effect of c-neu/ErbB2 Expression Levels on Estrogen Receptor alpha-Dependent Proliferation in Mammary Epithelial Cells: Implication for Breast Cancer Biology. *Cancer Research*, 66: (21), 10391-10398, 2006

Under Review / Revision

Caldwell L*, Nelson AH, Hanson E**, Peterson A**, Neilson A, Bradshaw K**, Duhoon A, Dennison JR, E Vargis[+]. Towards the development of a versatile, low-cost miniature rotary cell culture system to simulate microgravity within an irradiated environment. (resubmitted after 1st revision, 7/17/20) – **Invited Submission**

Clegg MH*, Harris T, Zhang X, Barney J**, Jones J[+], E Vargis[+]. Silkworm silk fiber bundles as improved in vitro scaffolds for skeletal muscle. (submitted 7/3/20)

Potter M, Hanson C, Anderson AJ, Vargis E[+], DW Britt[+]. Abiotic stressors impact outer membrane vesicle composition in a beneficial rhizobacterium: Raman spectroscopy characterization. (submitted 7/24/20)

Conference Proceedings (also presented as Conference Talks)

Hanson C*, Sieverts M**, Tew K**, Dykes A**, Salisbury M**, E Vargis[+]. The use of microfluidics and dielectrophoresis for separation, concentration, and identification of bacteria. *Microfluidics, BioMEMS, and Medical Microsystems XIV - SPIE Proceedings 97050E*, 2016

Baker QB, Podgorski GJ, Johnson CD, Vargis E, NS Flann[+]. Bridging the Multiscale gap: Identifying Parameters from Multicellular Data. *IEEE Conference on Computational Intelligence in Bioinformatics and Computational Biology*, 2015

O'Brien CM, Vargis E, Slaughter C, Rudin AP, Herington JL, Bennett KA, Reese J, A Mahadevan-Jansen[+]. Characterization of Human Cervical Remodeling throughout Pregnancy using In Vivo Raman Spectroscopy. *Photonic Therapeutics and Diagnostics XI – SPIE Proceedings 93032F*, 2015

Vargis E, Foster C, Peterson CB, Morrell-Falvey JL, Retterer ST, CP Collier[+]. Developing In Vitro Models of the Sub-Retinal Microenvironment. *Proceedings of the 4th Annual Biomedical Sciences and Engineering Conference (BSEC)*, 21-23 May 2013 – **Peer-reviewed**

Vargis E, Webb CN, Paria BC, Bennett KA, Reese J, Al-Hendy A, A Mahadevan-Jansen[+]. Detecting Changes during Pregnancy with Raman Spectroscopy. *Proceedings of the 3rd Annual Biomedical Sciences and Engineering Conference (BSEC)*, pp.1-4, 15-17 March 2011 – **Peer-reviewed**

Vargis E, Webb CN, Paria BC, Bennett K, Reese J, Al-Hendy A, A Mahadevan-Jansen[+]. Using Raman Spectroscopy to Study the Onset of Labor: A Pilot Study. *Advanced Biomedical and Clinical Diagnostic Systems IX - SPIE Proceedings 7890-45*, 2011

Vargis E, Byrd T, Reese J, Khabele D, Al-Hendy A, A Mahadevan-Jansen[+]. Detecting Changes in the Cervix with Raman Spectroscopy. *American Institute of Physics Conference Series*, 1267, 441-442, 2010

Vargis E and A Mahadevan-Jansen[+]. Implementing and Assessing a Challenge-Based Module for Spectroscopy in a Biomedical Optics Class. *Proceedings of the 2010 American Society for Engineering Education (ASEE) Annual Conference and Exposition*, (CD-ROM), Session AC 2010-1759: 18 Pages, 2010 – **Peer-reviewed**

Vargis E, Robertson K, Al-Hendy A, Reese J, A Mahadevan-Jansen[+]. Detecting Changes during Pregnancy with Raman Spectroscopy. *Biomedical Vibrational Spectroscopy VI: Advances in Research and Industry, Raman Spectroscopy and Non-Cancer Applications - SPIE Proceedings 7560-18*, 2010

Magazine Articles

Hanson C[*] and E Vargis[+]. Microscopy and Raman Imaging: Open-system Raman Microscopy. *Laser Focus World*. May 5, 2015

Mahadevan-Jansen A[+], Keller MD, Vargis E, Caldwell B, Nguyen T-Q, Granja NdM, Sanders M, MC Kelley. Looking Below the Surface of Breast Tissue during Surgery. *Spectroscopy*. June 1, 2011

Technical Notes

Vargis E and A Mahadevan-Jansen[+]. Using Raman Spectroscopy to Detect Malignant Changes In Vivo. *Princeton Instruments' Technical Note*, 2011

Invited Talks

Vargis E. Plenary Speaker. *Utah Conference for Undergraduate Research*. February 2020.

Vargis E and Roberts N. Powers of 10: Nano. *Science Unwrapped*. February 2019.

Vargis E. Combined Dielectrophoresis and Raman Spectroscopy for Detection and Identification. *USU's Department of Animal, Dairy, and Veterinary Sciences & Center for Integrated BioSystems Seminar Series*. September 2018

Vargis E. Customizable Raman Microspectroscopy for Bacterial Detection. *New Approaches in Light Microscopy*. Harvard University. November 2017

Vargis E. Understanding and Detecting Disease using Tissue Engineering and Biophotonics. *USU's Department of Animal, Dairy, and Veterinary Sciences & Center for Integrated BioSystems Seminar Series*. November 2016

Vargis E. Spectroscopic Applications in the Life Sciences. Webcast for *BioOptics World*. March 2014

Conference Oral Presentations (*graduate / **undergraduate student in Vargis Lab)

Caldwell L*, Hanson E**, Nelson A, Harding C*, Dennison JR and E Vargis. Simulating Muscle Atrophy due to Microgravity and Ionizing Radiation. *American Society for Gravitational and Space Research (ASGSR)*. October 2018

Clegg M*, Soboleva T, Berreau L, Takemoto J, Jones J, and E Vargis. *In Vitro* Muscular Atrophy Model with Suspended Muscle Fibers. *ASGSR*. October 2018

Farjood F* and E Vargis. Mechanisms of Abnormal Angiogenesis in Retinal Disease. *USU's Student Research Symposium*. April 2018. – **Best Graduate Oral Presentation in Engineering**

Caldwell L*, Harding C*, Hanson E**, Nelson A, Dennison JR, E Vargis. Characterizing the Effects of Radiation on Muscle Cells. *Institute of Biological Engineering*. April 2018

Hanson C* and E Vargis. Combined Dielectrophoresis and Raman Spectroscopy for Detecting and Identifying Bacteria. *Institute of Biological Engineering*. April 2018

Wadsworth I**, Jensen Z**, Harris T, Caldwell L**, Singh H**, Hansen B**, Lewis RV, E Vargis. Optimizing the Growth and Characterization of Retinal Pigment Epithelial Cells. *Biomedical Engineering Western Regional Conference*. January 2017

Clegg M**, Harding C*, Clegg T**, Takemoto J, E Vargis. In vitro Antioxidant Treatment Model for Oxidative Stress in Microgravity. *Biomedical Engineering Western Regional Conference*. January 2017 – **First Place in Oral Presentation**

Farjood F* and E Vargis. Isolation Affects VEGF Expression in Retinal Pigment Epithelial Cells. *Institute of Biological Engineering*. April 2016

Hanson C* and E Vargis. The Use of Microfluidics and Dielectrophoresis for Separation, Concentration, and Identification of Bacteria. *SPIE Photonics West: Microfluidics, BioMEMS, and Medical Microsystems XIV*. February 2016

Israelsen ND* and E Vargis. Raman Microscope System for the Detection of B-cell Malignancies using Surface-Enhanced Raman Scattering. *Biophotonic Imaging for Medicine: A Digital Conference*. June 2015

Gertsch S, Bedingfield S**, Lawanto S**, E Vargis. Targeted Drug Delivery System for Kidney and/or Liver Failure Patients using Human Serum Albumin. *National Conference on Undergraduate Research*. April 2015

Gertsch S, Bedingfield S**, Lawanto S**, E Vargis. Targeted Drug Delivery System for Kidney and/or Liver Failure Patients using Human Serum Albumin. *USU's Student Research Symposium*. April 2015 – **First Place in Undergraduate Sciences Podium Presentation**

O'Brien CM, Vargis E, Slaughter C, Rudin AP, Bennett K, Reese J, A Mahadevan-Jansen. Detection of Maturational Changes in the Pregnant Human Cervix Using In Vivo Raman Spectroscopy. *Society of Reproductive Investigation Annual Meeting in San Francisco, Hot Topics Session*. March 2015

Gertsch S, Bedingfield S**, Lawanto S**, and E Vargis. Targeted Drug Delivery System for Kidney and/or Liver Failure Patients using Human Serum Albumin. *Institute of Biological Engineering*. March 2015

Israelsen ND* and E Vargis. Surface-enhanced Raman Spectroscopy Based Detection of Leukemia Cell Surface Markers. *SciX 2014 Conference Presented by FACSS*. September 2014

Hanson C* and E Vargis. Application of SERS Magnetic Nanoparticles to Concentrate, Detect, and Identify Mycobacteria. *SciX 2014 Conference Presented by FACSS*. September 2014

O'Brien CM, Vargis E, Reese J, Bennett K, A Mahadevan-Jansen. In Vivo Raman Spectroscopy as a Clinical Tool to Detect Biomedical Changes in the Pregnant Cervix. *SPIE Photonics West*. January 2014

Vargis E. Development of Tissue Models and Spectroscopy Disease Detection Platforms for Biomedical Applications. *nanoUtah*. October 2013.

O'Brien CM, Vargis E, Brown N, Paria BC, Reese J, A Mahadevan-Jansen. Characterization of Cervical Tissue from Preterm Labor Mouse Models Using In Vivo Raman Spectroscopy and Ex Vivo Biomechanical Testing. *Biomedical Engineering Society (BMES) Annual Meeting.* October 2012

Vargis E, Webb CN, Bennett K, Al-Hendy A, A Mahadevan-Jansen. Raman Spectroscopy: an Effective Method of Detecting Biochemical Changes of the Pregnant Cervix. *SPIE Photonics West: Biomedical Vibrational Spectroscopy VII: Advances in Research and Industry.* January 2012

Pence IJ, Vargis E, Nguyen T-Q, Patil C, Ellis D, A Mahadevan-Jansen. In vivo Raman Spectroscopy of the Skin: Advances and Issues for Clinical Implementation. *SPIE Photonics West: Photonics in Dermatology and Plastic Surgery*. January 2012

Pence IJ, Patil CA, Vargis E, Walsh A, Krishnamoorthi H, Cayce J, Paras C, Makowski A, Keller MD, Bi X, Mackanos M, Jansen ED, Ellis DL, A Mahadevan-Jansen. Analysis of Reliability of Multiple Raman Spectroscopy Systems in vivo for Clinical Implementation. *SPIE Photonics West: Design and Quality for Biomedical Technologies IV*. January 2011

Vargis E, Byrd T, Roberts EC, Khabele D, A Mahadevan-Jansen. Using Raman Spectroscopy to Detect Cervical Dysplasia in Minority Populations. *SPIE: Photonics West: Advanced Biomedical and Clinical Diagnostic Systems VIII, Clinical Diagnostics Systems I.* January 2010

Vargis E, Kanter EM, A Mahadevan-Jansen. Detecting Cervical Cancer with Raman Spectroscopy. *SPIE: Photonics West: Advanced Biomedical and Clinical Diagnostic Systems VIII, Raman Spectroscopy.* January 2009

Perez JW, Vargis E, Wright DW, Haselton FR. Nano Tools for Viral Detection. *Southeast Region of the American Chemical Society Annual Meeting.* October 2007

Selected Conference Posters (*graduate student in Vargis Lab; **undergraduate student in Vargis Lab)

Farjood F* and E Vargis. Mechanical Stress in RPE Cells Induces VEGF Expression and Promotes in vitro Angiogenesis. *Association for Research in Vision and Ophthalmology (ARVO)*. May 2018

Paterson C**, Harris T, Farjood F*, Lewis R, E Vargis. Characterizing the growth of retinal pigment epithelial cells on recombinant spider silk proteins. *USU's Student Research Symposium*. April 2018. – **Best Undergraduate Poster Presentation in Engineering**

Caldwell L*, Hanson E**, Dennison JR, E Vargis. Characterizing the Effects of Radiation on Muscle Cells. *ASGSR Annual Meeting (ASGSR) Annual Meeting*. October 2017

Farjood F* and E Vargis. Effect of Intracellular Junction Formation on VEGF Expression in Retinal Pigment Epithelial Cells. *ARVO*. May 2017

Hanson C* and E Vargis. Proposed DEP-Raman device for simultaneous trapping and identification of bacteria. *USU's Student Research Symposium*. April 2017. – **First Place in Graduate Student Poster Presentation**

Harding C*, Takemoto J, E Vargis. *In Vitro* Modeling of Microgravity-Induced Muscle Atrophy and Spaceflight Radiation. *ASGSR Annual Meeting*. October 2016

Wadsworth I**, Singh H**, Caldwell L**, Jensen Z**, Hansen B**, Lewis R, E Vargis. Optimizing The Growth and Characterization of Retinal Pigment Epithelial Cells. *BMES Annual Meeting*. October 2016

Glaittli K, Caldwell L**, Dykes A**, Harding C*, Britt D, E Vargis. Comparison of Polysulfone and Collagen Substrates as a Membrane for the Growth of Murine Myoblast Cell Culture. *BMES Annual Meeting.* October 2016

Hanson C* and E Vargis. A proposed cDEP device design for improved device reusability and range of applied voltage. *SciX 2016 Conference Presented by FACSS*. September 2016

Farjood F* and E Vargis. Effect of Isolation and Aging on VEGF Expression in ARPE-19 Cells. *ARVO*. May 2016

Hanson C* and E Vargis. Use of SERS Magnetic Nanoparticles to Concentrate and Identify Mycobacteria. *American Institute of Chemical Engineers–AES Electrophoresis Society Annual Meeting*. November 2015

Harding C*, Takemoto J, E Vargis. Prevention of Oxidative Stress and Microgravity-Induced Muscular Atrophy with Mesobiliverdin-IX*α*. *ASGSR Annual Meeting.* November 2015 – **3rd Place Winner**

Hanson C* and E Vargis. Comparison of Machine Learning Methods to Identify Bacteria using Raman Spectroscopy. *SciX 2015 Conference Presented by FACSS*. September 2015

Harding C*, Takemoto J, E Vargis. Prevention of Microgravity-Induced Muscular Atrophy with Mesobiliverdin-IX*α*. *Hansen Life Sciences Retreat*. September 2015 – **Poster Award Winner**

Hanson C* and E Vargis. Use of SERS Magnetic Nanoparticles to Concentrate and Identify Mycobacteria. *nanoUtah*. October 2014

Israelsen ND* and E Vargis. Surface-Enhanced Raman Scattering (SERS) Nanoprobes for Detecting Hematological Malignancies. *nanoUtah*. October 2014

Byrd TT, Vargis E, O'Brien CM, Logan Q, Khabele D, A Mahadevan-Jansen. In Vivo Raman Spectroscopy Detects Cervical Intraepithelial Neoplasia with High Accuracy in Diverse Population. *Society for Gynecologic Investigation (SGI).* March 2014

O' Brien CM, Herrington J, Vargis E, Brown N, Paria BC, Reese J, A Mahadevan-Jansen. In Vivo Detection of Biochemical Differences in the Pregnant Mouse Cervix between Wild Type and COX-1 KO Mice. *SGI.* March 2014

O'Brien C, Vargis E, Brown N, Reese J, Paria BC, A Mahadevan-Jansen. In Vivo Detection of Biochemical Change in the Pregnant Cervix in Humans and Mouse Models. *SGI.* March 2013

Vargis E, Mortensen N, Foster C, Retterer S, CP Collier. Using Microfluidic Devices to Study Diseases of the Eye. *BMES Annual Meeting*. October 2012

O'Brien C, Vargis E, Brown N, Paria BC, Reese J, Bennett KA, A Mahadevan-Jansen. Early Detection of Preterm Labor in vivo Using Raman Spectroscopy. *Biophotonics and Imaging Graduate Summer School 2012 (BIGSS 12)*. June 2012 – **2nd Place**

Vargis E, Webb CN, Al-Hendy A, Bennett KA, A Mahadevan-Jansen. Detecting Biochemical Changes in the Human Cervix with Raman Spectroscopy. *SGI.* March 2012

Vargis E, Byrd T, Khabele D, A Mahadevan-Jansen. Detecting Cervical Dysplasia in Minority Populations using Raman Spectroscopy. *National Cancer Institute: Cancer Detection and Diagnostic Technologies for Global Health.* August 2011

Vargis E, Webb CN, Paria BC, Bennett KA, Reese J, Al-Hendy A, A Mahadevan-Jansen. Raman Spectroscopy: An Effective Method of Detecting Biochemical Changes of the Pregnant Cervix. *SGI.* March 2011

Vargis E, Byrd T, Reese J, Khabele D, Al-Hendy A, A Mahadevan-Jansen. Detecting Changes in the Cervix with Raman Spectroscopy. *International Conference on Raman Spectroscopy (ICORS).* August 2010

Vargis E, Byrd T, Khabele D, A Mahadevan-Jansen. Using Raman Spectroscopy to detect cervical dysplasia in minority populations. *Society of Gynecologic Oncologists (SGO).* March 2010

Vargis E, Robertson K, Reese J, Al-Hendy A, A Mahadevan-Jansen. Detection of Preterm Labor with Raman Spectroscopy. *Advances in Optics for Biotechnology, Medicine and Surgery XI: Clinical Challenges and Research Solutions.* June 2009

Vargis E, Kanter EM, Majumder S, Jones H III, A Mahadevan-Jansen. Cervical Cancer Detection with Raman Spectroscopy. *SPEC 2008: Shedding Light on Disease: Optical Diagnosis for the New Millennium*. October 2008

Vargis E, Kanter EM, Majumder S, Jones H III, A Mahadevan-Jansen. Cervical Cancer Detection with Raman Spectroscopy. *Vanderbilt-Ingram Cancer Center Retreat*. May 2008 – **Honorable Mention**

Vargis E, Perez JW, Wright DW, FR Haselton. Development of DNA Logic Tags to Improve Detection by Antibodies. *BMES Annual Meeting.* September 2007

Shyamala G, Chou Y-C, E Vargis. Impact of c-neu/erbB2 on Estrogen and Estrogen Receptor α-Dependent Proliferation of Mammary Epithelial Cells. *Era of Hope Conference*. June 2005

Teaching Experience

Awards

Outstanding Teacher, Department of Biological Engineering	2018

Utah State University

Department of Biological Engineering: Course Instructor

Biological and Environmental Thermodynamics (BENG 2400)	2020 - present
Introduction to Research and Engineering Design (BENG 1000)	2015 - 2019
Graduate Research Seminar (BENG 6510/7510)	2015; 2018
Introduction to Biophotonics (BENG 5840/6840)	2014
Tissue Engineering (BENG 5890/6890)	2014 - present

Other Courses

University Connections – A First Year Experience (USU 1010)	2017 - present

Honors Program

Departmental Honors Advisor	2018 - present

University of California, Berkeley

Teaching Assistant, Department of Plant and Microbial Biology	2005
AmeriCorps Fellow, Destination: College!, Berkeley, CA	2002 - 2003

Student and Postdoctoral Advising

Awards

Outstanding Graduate Mentor, Department of Biological Engineering	2017, 2018
Outstanding Graduate Mentor, College of Engineering	2018

Postdoctoral Trainees

Cynthia Hanson, PhD Biological Engineering	2018 - 2019
Amir Ahmadpour, PhD Animal Science	2019

PhD Dissertation Committees – Chair (3)

Chase Paterson, expected 2023	2019 - present
2019 Department of Biological Engineering Valedictorian	
Farhad Farjood	2015 - 2019
2018 College of Engineering, Outstanding Engineering Scholar	
Cynthia Hanson	2013 - 2018
2014/2015 Dissertation Enhancement Award ($4000)	
2015 Optics and Photonics Education Scholarship by SPIE ($2000)	
2016 Biological Engineering Department Graduate Researcher of the Year	
2016 Graduate Research and Creative Opportunities Recipient ($1000)	
2017 School of Graduate Studies Dissertation Fellowship ($3000)	

Master's Thesis Committees – Chair (5)

Matt Clegg	2018 - 2020
2018 College of Engineering Master's Student of the Year	
Lori Caldwell	2017 - 2020
Charles Harding	2014 - 2018
2015, 2016 Utah NASA Space Grant Consortium Fellowship ($15,000/year)	
Nathan Israelsen	2014 - 2015
Aaron Fronk	2013 - 2015

PhD Dissertation Committees - Member

Cheng Chen	2020 - present
Biological Engineering, expected 2022	
Jie Ren	2020 - present
Biological Engineering, expected 2022	
Junan Geng	2018 - present
Biological Engineering, expected 2021	
Koleton Hardy	2018 - present
Biochemistry, expected 2022	
Han Zhang	2017 - 2019
Biological Engineering	
Michaela Hugie	2017 - 2019
Biological Engineering	
Thomas Harris	2015 - 2018
Biological Engineering	
Lei Sun	2014 - 2017
Biological Engineering	

Qanita Bani Baker 2014 - 2015
Computer Science

Master's Thesis Committees - Member

Charles Barantine 2017 - present
Biological Engineering, expected 2020
Ian Wadsworth 2018 - 2020
Biological Engineering
Matthew Potter 2018 - 2020
Biological Engineering, expected 2020
Michelle Bonebrake 2016 - 2019
Biological Engineering, Summer 2019
Sherissa Ward 2014
Biological Engineering, Fall 2014

Undergraduate Students

Biological Engineering

Active (8): Emilee Rickabaugh (2020-), Dillon Weatherston (2020-), Jamen Cannon (2020-), Jess Papenfuss (2019-), Kelsey Mitchell (2018-), Hannah Smith (2018-), Anna Costner (2018-), Ivy Hansen (2017-)

Past (27): Morgan Bishop (2018-2020), Eryn Hanson (2017-2020), Nate Barney (2019-2020), Tessa Burrows (2017-2020), Jacob Barney (2018-2019), Andrea Peterson, (2016-2019), Derek Tuttle (2013-2019), Chase Paterson (2016-2019, PhD student), Caleb Thompson (2017-2018), Connor Klassen (2018), Caleb Walker (2018), Taylor Clegg (2016-2017), Ian Wadsworth (2015-2017, MS student), Harsh Singh (2014-2017), Matt Clegg (2016-2017, MS student), Zach Jensen (2016-2017), Cameron Zabriskie (2016-2017), Lori Caldwell (2014-2016, MS student), Annelise Dykes (2015-2016), Michael Sieverts (2015-2016), Ammon Hepworth (2015-2016), Cody Maughn (2015-2016), Luke Jarvis (2014-2016), Stephanie Lawanto (2014-2015), Donald Wooley (2014-2016), Robert Smiley (2013-2016), Karen Tew (2014-2015)

Other departments (9): Megan Sparks (Biology, 2019-), Justin Harris (Biology, 2018-2019), Gareema Dhiman (Logan High School, 2017-2019), Kara Swenson (Biochemistry, 2015-2018), Jessica Burt (Biology, 2016-2017), Bret Hansen (Business, 2015-2016), Michaela Salisbury (Nutrition, 2015), Peter Haight (Biology, 2014-2015), Ethan Williams (Applied Math, 2014)

College of Engineering Undergraduate Research Program (EURP) Fellows (4): Kelsey Mitchell (2020), Morgan Bishop (2019), Tessa Burrows (2019), Chase Paterson (2018)

Undergraduate Research and Creative Opportunities (URCO) Recipients (13): Morgan Bishop (2019), Eryn Hanson (2019), Tessa Burrows (2019), Chase Paterson (2018), Cameron Zabriskie (2017), Kara Swenson (2017), Ian Wadsworth (2016), Lori Caldwell (2015), Luke Jarvis (2015), Robert Smiley (2015), Peter Haight (2015), Stephanie Lawanto (2014), Donald Wooley (2014)

Awards

Chase Paterson: Undergraduate Researcher of the Year, Department of Biological Engineering (2019)
Morgan Bishop: Peak Prize for Undergraduate Researcher of the Year, Utah State University (2020)

Prior to USU: Cristen Peterson (ORNL), Marcus Gates (Fisk / Vanderbilt University)

Other Mentees

Chidinma Iwueke, Laboratory Technician, Vanderbilt University 2007

Kendra Haver, Hunters Lane High School teacher, Vanderbilt University 2006
Participant in Research Experience for Teachers, an NSF program

Honors Contracts

Tessa Burrows, Biological Engineering	2018, 2019
Kara Swenson, Biochemistry	2016
Karen Tew, Biological Engineering	2015
Sean Bedingfield, Biological Engineering	2014

Directed Studies

Austin Heywood, Biological Engineering, 1 credit, undergraduate	2014

Senior Design Groups (Biological Engineering; 3 URCO Recipients)

Michael Cotner, Jacilyn Fielding, Kelsey Mitchell, Teren Teeples, Andrew Kjar	2020-2021
Chase Gabbitas, Chase Paterson, Austin Simmons	2018
Lori Caldwell, Annelise Dykes, Katie Glaittli *URCO Recipient - Summer 2016*	2016
Justus Clark, Dallon Durfey, Jared Theurer *URCO Recipient - Spring 2016*	2016
Sean Bedingfield, Sara Gertsch, Stephanie Lawanto *URCO Recipient - Spring 2014*	2014

Professional Service

External

Committees: Nominating Committee, Members-at-Large, Society of Women Engineers 2019-2022

Councilor-at-Large: Institute of Biological Engineering 2017-2019

Grant Reviewer: NSF CASIS Program 2019; European Research Council 2019; National Science Center, Poland 2018; NSF CBET Major Research Instrumentation Program 2018, 2019, 2020; NSF Graduate Research Fellowship Program 2015-2019; Biomedical Research Foundation of Northwest Louisiana 2016; NASA EPSCOR 2017

Conferences: Reviewer, BMES annual meeting 2015; Session Chair, BMES 2014; Session Chair, Institute of Biological Engineering 2015-2019

Journal Reviewer: American Journal of Physiology - Heart and Circulatory Physiology, Analyst, Annals of Biomedical Engineering, Biomaterials, Diagnostics, European Journal of Cancer, Food Research International, IEEE Transactions on Biomedical Engineering, Investigative Ophthalmology and Visual Science, Journal of Biomedical Optics, Journal of Biomedical Science, Journal of Biophotonics, Journal of Cell Science, Journal of Ocular Pharmacology and Therapeutics, Molecular and Cellular Biochemistry, Molecular Vision, Molecules, Nanotechnology, Photodiagnosis and Photodynamic Therapy, PLOS One, Proceedings of the National Conference of Undergraduate Research, Scientific Reports, Sensing and Bio-Sensing, Sensors, Sensors and Actuators: B. Chemical, SPIE Press, Tissue and Cell, Vibrational Spectroscopy

Professional Affiliations: American Heart Association, Association for Research in Vision and Ophthalmology, Biomedical Engineering Society, Institute of Biological Engineering

Outreach: Utah Women in Higher Education Network (UWHEN) contributor, SACNAS NSF LEVERAGE Engineering Faculty Career Panelist 2017

Leadership Training: NSF-Leverage Academic Leadership for Women in Engineering (ALWE) workshop at Society of Women Engineers Conference 2018 (fully-funded)

University / College

Invited Speaker

Utah Conference on Undergraduate Research: Keynote Speaker	February 2020
Science Unwrapped: Powers of 10: Nano	February 2019
Society of Women Engineers Opening Social	September 2017
TEDxUSU: *Building Muscles and Mentors*	October 2016

Faculty Advisor

Society of Women Engineers	2016 - present
Biomedical Engineering Society *Chartered by national society, May 2016*	2015 - 2020

Panelist

Connections (3-day First Year Experience) Faculty Panel	August 2018, 2019
Center for Women & Gender Women's Leadership Initiative	January 2019
Huntsman Scholars Night	February 2018
Student Alumni Association: Diversity Networking Night	February 2018
Office of Graduate Studies: Building Relationships for Career Success	November 2017
ARTsySTEM Symposium *(supported by the National Endowment for the Arts)*	April 2015
Society of Women Engineers' Engineering Extravaganza	April 2015

Member

College of Engineering Research Council Member	2019 - present
Honors Faculty Advisory Board – College Representative	2019 - present
Undergraduate Research Advisory Board – College Representative	2015 - 2017

Mentor

Center for Women & Gender Women's Leadership Initiative	2017 - 2020

Workshop Leader

Engineering State	2015 - present
Society of Women Engineers' Engineering Extravaganza	2014 - present

Judge

Student Research Symposium: Oral and Poster Presentations	2014 - present

Founder & President

SPIE Student Chapter (Vanderbilt University)	2009 - 2010

Departmental

Utah State University: Biological Engineering Department

Member

Undergraduate Curriculum Committee	2013 - present
Department Head Search Committee	2016 - 2018
Graduate & ABET Committees	2013 - 2015

Vanderbilt University: Biomedical Engineering Department

Founder, President, Representative At-large Biomedical Engineering Graduate Student Council	2006 - 2010