

Sowmya Subramanian, PhD

SENIOR PATENT AGENT

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Dr. Sowmya Subramanian draws on her unique multidisciplinary background and industry experience to assist in the preparation and prosecution of patent applications, conduct landscape and freedom-to-operate analyses, formulate non-infringement positions, perform diligence reviews, and assist in IP litigation matters. She also works closely with Choate's intellectual property attorneys to advise clients on various aspects of their IP strategy and patent portfolio management.

Prior to joining Choate, Sowmya worked as a Science Writer at a science education firm, where she drafted and reviewed scripts and storyboards for educational videos addressing complex concepts in the fields of electrical engineering, bioMEMS, biomedical engineering, bioengineering, nanotechnology, biological sciences, and chemistry.

While working on her PhD from the University of Maryland, Sowmya designed and developed an integrated medical device for real-time bacterial biofilm detection and treatment using Lab-on-a-Chip technology. During her master's program, she developed a carbon nanotube field-effect transistor (CNTFET) biosensor for pico-gram level genetic detection of Escherichia coli in food samples.

Focus Areas

Intellectual Property

IP Counseling

Representative Engagements

- Assist in portfolio management, preparation, and prosecution of patent applications related to electrical and computer engineering, bioengineering, nanotechnology, and biological products. Particular experience in therapeutic, diagnostic, and device spaces, and in biocompatible/biologically relevant materials.
- Provide intellectual property portfolio strategy, including patent strategy and portfolio management, to clients of varied sizes.
- Conduct patent landscape and freedom-to-operate analyses.
- Perform diligence reviews of target companies or assets on behalf of investors or acquirers.
- Assist in IP litigation matters.

Publications and Presentations

- "Microsystem for Biofilm Characterization and Sensing – A Review," author, *Biofilm*, Volume 2, 100015, December 2020
- "Flexible Platform for In Situ Impedimetric Detection and Bioelectric Effect Treatment of *Escherichia Coli* Biofilms," *co-author*, *IEEE Transactions on Biomedical Engineering*, Volume 66, Issue 5, May 2019
- "Flexible Impedance Sensor for *In Situ* Sensing of Catheter Biofilms," co-author, The 21st International

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Conference on Miniaturized Systems for Chemistry and Life Sciences (MicroTAS 2017), Savannah GA, October 2017

- "An Integrated Microsystem for Real-Time Detection and Threshold-Activated Treatment of Bacterial Biofilms," author, *ACS Interfaces and Applied Materials,* Volume 9, Issue 37, Pages 31362-71, August 2017
- "Microsystems for Detecting and Treating Antibiotic Resistant Bacterial Biofilms," co-author, 2017 Global Grand Challenges Summit, Washington D.C., July 2017
- "Electrodynamic Modeling of Bacterial Biofilm Impedance Sensing," co-author, BMES Frontiers in Medical Devices, College Park MD, May 2017
- "Bacterial Biofilms on 3D-printed Implant Materials," *co-author*, AVS 63rd International Symposium, Nashville TN, November 2016
- "Micro FBI: A Microsystem for Feedback-based Biofilm Inhibition," author, IEEE Sensors, Orlando FL, October-November, 2016 (Invited Paper)
- "Autoinducer-2 Analogs and Electric Fields – An Antibiotic-Free Bacterial Biofilm Combination Treatment," author, *Biomedical Microdevices*, Volume 18, Issue 5, Article 95, October 2016
- "Real-time Impedimetric Sensing of Bacterial Biofilms in Microfluidics," speaker, 26th Anniversary World Congress on Biosensors, Gothenburg Sweden, May 2016
- "A Surface Acoustic Wave Biofilm Sensor Integrated with a Treatment Method based on the Bioelectric Effect," co-author, *Sensors and Actuators A: Physical*, Volume 238, February 2016
- "An Optical Microfluidic Platform for Spatiotemporal Biofilm Treatment Monitoring," co-author, *Journal of Micromechanics and Microengineering,* Volume 26, Number 1, 015013, January 2016
- "Effect of Electrical Energy on the Efficacy of Biofilm Treatment using the Bioelectric Effect," author, *npj Biofilms and Microbiomes*, Volume 1, 15016, September 2015
- "Multi-depth Valved Microfluidics for Biofilm Segmentation," co-author*, Journal of Micromechanics and Microengineering*, Volume 25, Number 9, 095003, August 2015
- "A Bacterial Biofilm Combination Treatment using a Real-Time Microfluidic Platform," *speaker,* 18th International Conference on Solid-State Sensors, Actuators and Microsystems, Transducers, Anchorage AK, June 2015
- "A Real-time Bacterial Biofilm Characterization Platform using a Microfluidic System," speaker, Mid-Atlantic Micro/Nano Alliance (MAMNA), Columbia MD, April 2015
- "The Development of a Valve based Microfluidic Biofilm Reactor for Biofilm Studies with Integrated Controls," speaker, AVS 61st International Symposium and Exhibition, Baltimore MD
- "An Enhanced *Pseudomonas aeruginosa* Biofilm Treatment using an Integrated Microsystem," co-author, The 18th International Conference on Miniaturized Systems for Chemistry and Life Sciences (MicroTAS), San Antonio TX
- "A Real-time Bacterial Biofilm Characterization Platform using a Microfluidic System," speaker, Technical Digest of the 2014 Solid-State Sensor and Actuator Workshop, Hilton Head SC
- "An Empirical Approach for Quantifying Loop-mediated Isothermal Amplification (LAMP) using Escherichia coli as a Model System," author, *PLoS ONE*, Volume 9, Issue 6, e100596
- "A Quantitative Model for Loop-mediated Isothermal Amplification (LAMP): Detection of Vero-toxin Producing E. coli," author, 24th Anniversary World Congress on Biosensors, Melbourne Australia
- "Microsystems for Characterization, Sensing and Treatment of Bacterial Biofilms," speaker, Mid-Atlantic Micro/Nano Alliance (MAMNA), Baltimore MD
- "Lab-on-a-chip Systems for Bacterial Biofilm Detection and Analysis," co-author, International Semiconductor Device Research Symposium (ISDRS), Bethesda MD (Invited paper)
- "Microfluidic Biofilm Observation, Analysis and Treatment (Micro-BOAT) Platform," co-author, Mid-Atlantic Micro/Nano Alliance (MAMNA), Gaithersburg MD
- "Loop-mediated Isothermal Amplification (LAMP) of Gene Sequences and Simple Visual Detection of

Products," *errata, Nature Protocols*, Volume 3, Issue 5, Pages 877-882

- "Rapid, Sensitive and Label-free Detection of Shiga-toxin Producing *Escherichia coli* O157 using Carbon Nanotube Biosensors," author, *Biosensors and Bioelectronics*, Volume 32, Issue 1
- "Biosensor for *E. coli* Detection in Food Samples," speaker, University of Maryland Joint Institute for Food Safety and Applied Nutrition (JIFSAN) Advisory Council Symposium, Greenbelt MD

Education & Credentials

- University of Maryland, PhD (2016)
- University of Maryland, MS (2012) *Electrical Engineering*
- Birla Institute of Technology and Science, MSc (2007) *Biological Sciences*
- Birla Institute of Technology and Science, BE (2007) *Electrical and Electronics Engineering*

Languages:

- Hindi (speak, read and write)
- Tamil (speak)
- Telugu (speak)
- Malayalam (speak)

Admissions

- U.S. Patent & Trademark Office