

Exponent®
Engineering & Scientific Consulting

Karthika Sankar, Ph.D.

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Professional Profile

Dr. Sankar specializes in the application of materials science for healthcare namely sensing and analysis, medical devices, and therapeutics. She has extensive experience with development of in vitro diagnostics for infectious diseases and biosensor platforms for general health monitoring, specifically women's health.

Dr. Sankar has expertise in electrochemistry and its applications for biosensors, corrosion, energy storage devices and water purification.

She is a Chemical Engineer and Materials Scientist by training and she has several years of laboratory experience in materials and biological characterization. She is proficient in running biological assays including immunoassays, kinetic, binding, lateral flow and proteomic assays and utilizing microbiology and molecular biology techniques (cloning, protein expression/purification, PCR). Her materials characterization experience includes microscopy (SEM, AFM, OM), mechanical testing (rheometry, indentation, load frame), chromatography (HPLC, LC-MS) and spectroscopic (UV-Vis, NMR, FTIR) techniques.

Prior to joining Exponent, she completed her Ph.D. work in Materials Science and Engineering at Boston University, which is expected to be conferred in 2023. Her dissertation focused on electrochemical biosensor development for health and disease biomarkers. Dr. Sankar co-founded Virex Health, a diagnostic company with a foundation based on her graduate work. In an advisory role, she participated in the acquisition process of the company by Sorrento Therapeutics for commercialization of the technology. Prior to starting her PhD work, she completed her Master's at Rice University and worked at Magna Imperio Systems, a startup focused on electrochemical water desalination technology.

Academic Credentials & Professional Honors

Ph.D., Materials Science and Engineering, Boston University, 2023

M.S., Materials Science and Nanoengineering, Rice University, 2016

B.Tech., Chemical Engineering and Materials Science, Amrita School of Engineering, India, 2015

Society of Women Engineers' Scholarship sponsored by Motorola Solutions Foundation, 2020-2021

Boston University Research Fellowship, 2017-2022

Indian Academy of Science Fellowship, 2014

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Prior Experience

Graduate Research Assistant, Boston University, 2017-2022

Co-founder and Advisor, Virex Health, 2020-2022

Materials Intern, Magna Imperio Systems, 2016-2017

Graduate Assistant, Rice University, 2015-2016

Undergraduate Research Assistant, Indian Institute of Technology, Madras, India, 2015

Languages

Malayalam

Patents

WIPO # WO/2022/016071, “Viral Detection Systems and Uses Thereof.” July 2021. K. Sankar, S. E. Schaus, J. E. Galagan, C. M. Klapperich, J. Connor, M. W. Grinstaff, K. Hearon.

Publications

K. Sankar, R. C. Baer, C. Grazon, R. C. Sabatelle, S. Lecommandoux, C. M. Klapperich, J. E. Galagan, M.W. Grinstaff. 2022. An allosteric transcription factor DNA-binding electrochemical biosensor for progesterone. ACS Sens. 7(4): 1132–1137.

J. C. Varela, K. Sankar, A. Hino, X. Lin, W. Chang, D. Coker, M. W. Grinstaff. 2018. Piperidinium ionic liquids as electrolyte solvents for sustained high temperature supercapacitor operation, Chem Comm. 54: 5590-5593.

Presentations

Sankar K., Baer R. C., Grazon C., Klapperich C. M., Galagan J. E., Grinstaff M. W. (2021). “An Impedance-based progesterone sensor using allosteric transcription factor”. Biomedical Engineering Society (BMES) Annual Meeting, Orlando, FL.

Sankar K., Baer R. C., Grazon C., Klapperich C. M., Galagan J. E., Grinstaff M. W. (2020). “An electrochemical progesterone sensor using an allosteric transcription factor”. Biomedical Engineering Society Annual Meeting (virtual).

Sankar K., Baer R. C., Grazon C., Klapperich C. M., Galagan J. E., Grinstaff M. W. (2020) “An allosteric transcription factor-based electrochemical progesterone sensor”. ECS PRiME International Meeting (virtual).

(2019) Poster presentation. “Optimization of DNA-based electrochemical sensors”. Materials Day, Boston University, Boston, MA.

Sankar K., Varela J. C., Grinstaff M. W. (2018) Poster presentation. “Piperidinium ionic liquids as electrolytes in supercapacitors and lithium-ion batteries at elevated temperatures”. Materials Research Society, Boston, MA.

Sankar K., Varela J. C., Grinstaff M. W. (2018). “Piperidinium and phosphonium ionic liquids as electrolytes in supercapacitors and lithium-ion batteries at elevated temperatures”. ACS National Meeting, Boston, MA.