***CURRICULUM VITAE (2 pages)***

**Joseph MK Irudayaraj**

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**EDUCATION**

**Ph.D. Biological Engineering**, Purdue University, West Lafayette, Indiana, USA.

**M.S. Biosystems Engineering**, University of Hawaii, USA.

**M.S. Computer Sciences**, University of Hawaii, USA.

**B.S. Agricultural Engineering**, College of Agricultural Engineering, TNAU, India.

**PROFESSIONAL APPOINTMENTS / DISTINCTIONS**

**FOUNDER PROFESSOR, DEPARTMENT OF BIOENGINEERING 07/2017- present**

University of Illinois at Urbana-Champaign, Urbana, IL

Develop drug delivery platforms for retinal diseases, cancer immunotherapy, and wound healing. Develop and apply super-resolution and genomic tools to understand epigenetic regulation and kinase signaling to understand pancreatic cancer and Crohn’s disease. We are also involved in the development of point of care devices for cervical cancer and infectious disease monitoring.

**ASSOCIATE DIRECTOR, Shared Resources, Cancer Center at Illinois (CCIL) 2018-present**

Oversee the operations of the four CCIL shared resources (SRs): Tumor Engineering and Phenotyping SR (TEP-SR), Micro and Nanotechnology SR (MNTL-SR), Biomedical Imaging SR (BMI-SR), and Roy J. Carver Biotechnology Center SR (CBC-SR).

**INTERIM DIRECTOR, Bindley Bioscience Center (BBC) 2015-02/2017**

Purdue University, West Lafayette, IN

BBC is staffed with 16 scientists and 5 support staff with core expertise in mass spectrometry, flow cytometry, imaging, biophysical analysis, and translational pharmacology. The director provides leadership and vision to BBC to advance collaborative and interdisciplinary research by engaging faculty, students, and industry. Other key components are managing human resources, staying current in instrumentation, engagement, and space allocation. The BBC director reports to the Director of Discovery Park and Executive VP for Research and Partnerships (EVPRP).

**DEPUTY DIRECTOR, Bindley Bioscience Center (BBC) 2012-02/2017**

Purdue University, West Lafayette, IN

Responsibilities are to initiate collaborative multidisciplinary projects and grants by forming and participating in large teams and multi-PI proposal opportunities. Provide the vision to keep the facilities world class, assist in core facility operations, space management, staff promotion, engagement and marketing. Create a venue for learning and professional development and develop new initiatives.

**PROFESSOR, Biological Engineering**  **2009 – 06/2017**

Purdue University, West Lafayette, IN

Develop single molecule tools and nanoscale imaging platforms comprising of fluorescence, and plasmonics in live cell biomedical discoveries relating to epigenetics, phosphorylation, and biosecurity. Develop and teach courses and engage in service activities that promote the Institution and Department.

**Co-leader** for the Purdue Center for Cancer Research (PCCR’s), Drug Delivery and Molecular Sensing (DDMS) research program (one of the four cores of PCCR). Lead multidisciplinary research program grants in cancer research, organize workshops and student research presentations, graduate training/recruiting/program grants in cancer.

**Co-director**, Physiological Sensing Facility (PSF) at BBC, a collaborative core which serves as an interdisciplinary resource to engage scientists and engineers in interdisciplinary research to develop advanced biosensor technologies.

**CHAIR OF ABE Graduate Program** **2009-2012**

**PROFESSOR, Mechanical Engineering, Basic Medical Sciences, Purdue U. (Courtesy)** **2013-17**

**HONORS, AWARDS AND KEY PROFESSIONAL/SERVICE CONTRIBUTIONS**

* **Fellow, American Association for the Advancement of Science (AAAS), 2022**
* **Fellow, International Academy of Medical and Biological Engineering (IAMBE), 2021**
* **Fellow, Royal Chemical Society, 2020**
* Sponsored Programs and Research Compliance (SPaRC) Team Award, UIUC, 2020
* **Fellow, Biomedical Engineering Society, 2019**
* Founder Professor of Bioengineering, University of Illinois at Urbana-Champaign, 2017
* IAFP GMA Food Safety Award, International Association of Food Protection, 2017
* Seed for Success Award, Office for EVPRP, Purdue University, 2016
* Honor Lectureship (Xingda lectureship), Peking University, Molecular Engineering, June 2015
* College of Engineering Research Excellence Award, Purdue University, 2015
* Fellow, American Institute of Medical and Biological Engineers, 2014
* Research Honor Award, Osmania University, Osmatech Foundation, Hyderabad, India, 2013
* Entrepreneurship Leadership Academy Fellow, Purdue University, 2012
* Excellence in Research Award, Office of the Vice President for Research, 2012

**CENTER RELATED EFFORTS AND INVOLVEMENT**

* Initiated a Cancer-focused Toxicology program in UIUC to secure an NIEHS-P42 superfund Center through a multidisciplinary partnership between the Institute of Genomic Biology, Beckman Institute, and Micro and Nanotechnology Laboratory along with 5 colleges at UIUC.
* Co-Director of the Shared Resources (SR) for the Cancer Center at Illinois (CCIL). An NIH-NCI P30 Core grant was submitted in May 2018. I am responsible for preparing the documents for three of the four shared resources (Imaging, Omics, Tumor engineering, and Nanotechnology) as well as in planning for the infrastructure for the Tumor Engineering SR along with a team. The next step is to prepare for the site visit in Sept/Oct 2018.
* Center for Food Safety Engineering grant (Purdue-USDA-ARS) on “Innovative Pathogen detection and characterization technologies for food safety” $ 6.0 million (03/2016-02/2021) (PI: Mauer; Co-PIs: Ladisch, Bhunia, Irudayaraj, Applegate, Bashir).
* Co-leader of the Drug Delivery and Molecular Sensing (DDMS) thrust area (one of the 4 major thrust areas) of the Purdue University Center for Cancer Research (PCCR). $ 4.5 million direct for 5 years (2010-2015).

**PUBLICATIONS [Peer-reviewed: 400+] Google Scholar Citation: >22,500. H-index = 82**

1. Messerschmidt, V., Ren, W., Tsipursky, M., and Irudayaraj, J. 2023. Characterization of Oxygen nanobubbles and in vitro evaluation of retinal cells in hypoxia. 2022. Translational Vision Sciences and Technology., 12(2), 16
2. Rashid, F., Liu, W., Wang, Q., Ji, B., Irudayaraj, J., Wang, N. 2023. Mechanomemory in protein diffusivity of chromatin and nucleoplasm after force cessation. PNAS, 120(13), e2221432120
3. Rashid, V., Dubinkina, V., Ahmad, S., Maslov, S., Irudayaraj, J. 2023. Gut microbiome-host metabolome homeostasis upon exposure to PFOS and GenX in Male Mice, Toxics 11(3), 281.
4. Vega, P., Mosier, N., Irudayaraj, J. 2020. Drug nano-delivery systems: From medicine to agriculture. Frontiers in Bioengineering and Biotechnology. (8).
5. Liu, W., Zhang, X., Wen, Y., Anastasio, M., and Irudayaraj, J. 2023. A machine learning approach to elucidating PFOS-induced alterations of repressive epigenetic markers with single cell imaging. Environ. Advances, 100344.

**INTELLECTUAL PROPERTY**

**Patents (last 3 years):** (1) Nanobubbles fabrication, Patent# 9968692. Patent awarded May 15, 2018; (2) Oxygen Nanobubbles for Imaging and Cancer Treatment. Publication date Sept 2018. US Patent App. 15/914,293; (3) Methods for detecting enzyme activity using fluorescence lifetime imaging. Patent# 10,023,902, awarded 07/2018; (3) Devices, Systems, and methods for the detection of a target analyte using magnetic focus lateral flow immunoassay techniques. Serial No.  PCT/US17/41724 [62/361,089 filed July 12, 2016. (4) Plasmonic signal amplification lateral flow sensors. US Patent Application#. US 10,006,906 B2. Filed June 26, 2018.