

Hanan Anis

Full Professor
School of Engineering Design and Teaching Innovation (SEDTI)
Faculty of Engineering, University of Ottawa
Telephone: 613-562-5800 Ext. 6709 Email: hanis@uottawa.ca

Education

1996 Ph.D. Engineering, University of Toronto
1991 M.A.Sc, Engineering, University of Toronto
1987 B.Sc., Engineering, University of Ain Shams, Egypt

Employment

2010-Present Full Professor, University of Ottawa
2004-2010 Associate Professor, University of Ottawa
2000-2003 Co-founder and Chief Technology Officer, Ceyba Inc., Ottawa
1998-2000 Optical System Advisor, Nortel Networks, Ottawa
1994-1998 Member of Scientific staff, Nortel Networks, Ottawa

Awards & Distinctions

2020 Fellow of the Canadian Academy of Engineering
2018 Medal of Distinction for engineering education, by Engineers Canada
2017 Engineering Ambassador award, by partners in research
2015 NSERC Chair of Entrepreneurial Engineering Design, The Chair focuses on enhancing design in the Faculty of Engineering by developing an "entrepreneurial mind set" in students and enabling them to design, build and test solutions to engineering problems in the context of validated market opportunities and business constraints (<http://engineering.uottawa.ca/NSERC>).

Scholarly and Professional Activities, Committees, Memberships

2021-present Director of the School of Engineering Design and Teaching Innovation (SEDTI)
2015-present Director of the Centre for Entrepreneurship and Engineering Design
2012-present Coordinator, Entrepreneurship and Innovation program, Faculty of Engineering,
2019-2021 Board member for the Canadian Engineering Education Association

Training of Highly Qualified Personnel

<i>Category</i>	<i>Current</i>	<i>Completed</i>	<i>Career Total</i>
Masters	2	7	9
Doctoral	4	6	9
PDF		3	3
Research Associate		3	3
Co-op		4	4
Other		3*	3*
Note: 1 completed Doctoral and 1 PDF	7	24	31

Hanan Anis

are Co-Supervision			
--------------------	--	--	--

* It should be noted that through CEED, I train over 40 HQP/term on a yearly basis. These numbers have not been included in the table above

2. EXTERNAL RESEARCH FUNDING:

Current funding

Year	Source	Type	Amount per year	Purpose	Yrs of funding
2021	NSERC discovery grant	G	28,000	Research	5
2021	SPARK Grant, Canadian Cancer Society, PI is Ben Tsang	G	150,000 (my portion is 51,000)	Research	1
2015	NSERC Chair in engineering design	G	200,000 (avg.)	Research	8

PUBLICATIONS:

Career Summary

Papers published in refereed journals 44
 Papers in refereed conferences 34
 Patents issued 8

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: **Kapaettu Satyamoorthy**

eRA COMMONS USER NAME (credential, e.g., agency login): SATYAMOORTHY

POSITION TITLE: **Professor & Director**

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Osmania University, Hyderabad, India	B.Sc.	1980	Botany/Zoology/ Chemistry
Bombay University, Bombay, India	M.Sc.	1983	Biochemistry
Bombay University, Bombay, India	Ph.D.	1987	Biochemistry

A. Personal Statement

I was born in Mangalore and educated in India, received MSc degree from Bombay University, Bombay, India and PhD from Cancer Research Institute, Bombay University, Bombay (1987) in the area of Biochemistry and served as research associate at Kansa State University, USA (1987-1989); then joined Wistar Institute at developmental biology group. I served as research scientist and senior scientist at The Wistar Institute, Philadelphia, USA where I worked with Dr. Meenhard Herlyn on the molecular basis of Melanoma and other cancer (1989-2001). In 2001, I joined Manipal Academy of Higher Education as senior scientist and established department of biotechnology which was ranked no 1 in Karnataka and 3 in India (Private Biotechnology colleges by Biospectrum Survey, 2011) to undertake graduate and postgraduate program in biotechnology, molecular biology, genetics, system Biology, genome engineering, tissue engineering and bioinformatics. In addition to this, center offers PhD programs in various disciplines of life sciences. I have also established molecular diagnostic center at Manipal Academy of Higher Education, which undertakes more than 160 molecular diagnostic services. I have published over 300 research articles in peer reviewed, high impact international journal and has twelve patents.

B. Positions and Honors

Positions

S. No.	Institution / Place	Position	From	To
1	Manipal School of Life Sciences, Manipal Academy of Higher Education, Manipal	Director	2006	Till date
2	Department of Cell & Molecular Biology, Manipal School of Life Sciences, Manipal Academy of Higher Education Manipal	Professor & Head	2015	2020
3	Department of Biotechnology, Manipal School of Life Sciences, Manipal Academy of Higher Education Manipal	Professor & Head	2002	2014
4	Senior Scientist and Associate Professor, Manipal Academy of Higher Education, Manipal	Senior Scientist and Associate Professor	2001	2002
5	The Wistar Institute, Philadelphia, PA	Senior Scientist	1994	2001
6	The Wistar Institute, Philadelphia, PA	Research Scientist	1989	1993

Honors

- Lady Tata Fellowship, Mumbai– 1985
- Birla Fellowship, Mumbai– 1987
- Wesley Fellowship, Kansas, USA – 1988
- Research Scientist, Wistar Institute, Philadelphia – since 2003
- Visiting Professor, UNSW, Sydney, Australia – 2008
- Honorary Professor, School of Chemistry and Molecular Biosciences, University of Queensland, Brisbane, Australia – since 2011
- Erasmus Mundus Professor, France, EU – 2011 – 2014.
- Dr. P.A.Kurup Memorial Endowment Award – 2013
- Dr TMA Pai Endowment Chair in Translational Genome Science – 2014-2016.

Currently, laboratory continues to work on genomics and epigenetic mechanisms, biosignatures and as therapeutic targets for human diseases, which is evident from international publications and patents. He is also actively involved in popularizing science among children and training teachers to teach sciences through number of workshops.

Recent Publications (Out total 312)

2022

1. Joshi MB, Kamath A, Nair A, Yt P, Sriranjini SJ, Gangadharan GG, **Satyamoorthy K**. 2022. Modulation of neutrophil (dys) function by Ayurvedic herbs and its potential influence on SARS-CoV-2 infection. *J Journal of Ayurveda and Integrative Medicine* 13: 100424

2021

2. Geanta M, Tanwar AS, Lehrach H, **Satyamoorthy K**, Brand A. 2021. Horizon Scanning: Rise of Planetary Health Genomics and Digital Twins for Pandemic Preparedness. *OMICS*. 2021 doi: 10.1089/omi.2021.0062.
3. Pujari, I., Thomas, A., Rai, P.S., **Satyamoorthy, K.**, Babu, V.S. 2021. In vitro bioproduction and enhancement of moscatilin from a threatened tropical epiphytic orchid, *Dendrobium ovatum* (Willd.) Kraenzl. *3 Biotech* 11: 507
4. Raghushaker CR, Rodrigues J, Nayak SG, Ray S, Urala AS, **Satyamoorthy K**, Mahato KK. 2021. Fluorescence and Photoacoustic Spectroscopy-Based Assessment of Mitochondrial Dysfunction in Oral Cancer Together with Machine Learning: A Pilot Study. *Anal Chem*. 93: 16520-16527
5. Hegde M, Bhat SM, Guruprasad KP, Moka R, Ramachandra L, **Satyamoorthy K**, Joshi MB. 2021. Human breast tumor derived endothelial cells exhibit distinct biological properties. *Biol Cell*. doi: 10.1111/boc.202100015.PMID: 34755911.
6. Shetty SS, Sharma M, Kabekkodu SP, Kumar NA, **Satyamoorthy K**, Radhakrishnan R.J. 2021. Understanding the molecular mechanism associated with reversal of oral submucous fibrosis targeting hydroxylysine aldehyde-derived collagen cross-links. *Carcinog*. 20: 9.
7. Warriar A, **Satyamoorthy K**, Murali TS. 2021. Quorum-sensing regulation of virulence factors in bacterial biofilm. *Future Microbiol*. 16: 1003-1021
8. Bhat SK, Joshi MB, Vasishtha S, Jagadale RN, Biligiri SG, Coronado MA, Arni RK, **Satyamoorthy K**. 2021. P-I metalloproteinases and L-amino acid oxidases from *Bothrops* species inhibit angiogenesis. *J Venom Anim Toxins incl Trop Dis*. 27: e20200180
9. Kuthethur R, Prasad K, Chakrabarty S, Prasada Kabekkodu S, Singh KK, Thangaraj K, **Satyamoorthy K**. 2021. Advances in Mitochondrial Medicine and Translational Research. *Mitochondrion* 61: 62-68.
10. Bhat S, Kabekkodu SP, Adiga D, Fernandes R, Shukla V, Bhandari P, Pandey D, Sharan K, **Satyamoorthy K**. 2021. ZNF471 modulates EMT and functions as methylation regulated tumor suppressor with diagnostic and prognostic significance in cervical cancer. *Cell Biol Toxicol*. 37: 731-749.
11. Chaudhari S, Ware AP, Jayaram P, Gorthi SP, El-Khamisy SF, **Satyamoorthy K**. 2021. Apurinic/Apyrimidinic Endonuclease 2 (APE2): An ancillary enzyme for contextual base excision repair mechanisms to preserve genome stability. *Biochimie* 190: 70-90.
12. Shetty S, Kouskouti C, Schoen U, Evangelatos N, Vishwanath S, **Satyamoorthy K**, Kainer F, Brand. 2021. Diagnosis of *Chlamydia trachomatis* genital infections in the era of genomic medicine. *Braz J Microbiol*. 52: 1327-1339.
13. Shalin TV, Jnana A, Sriranjini SJ, Tanwar AS, Brand A, Murali TS, **Satyamoorthy K**, Gangadharan GG. 2021. Exploring the signature gut and oral microbiome in individuals of specific Ayurveda prakriti. *Journal of Biosciences* 46:54.
14. Santhoshkumar R, Preethish-Kumar V, Polavarapu K, Reghunathan D, Chaudhari S, **Satyamoorthy K**, Vengalil S, Nashi S, Faruq M, Joshi A, Atchayaram N, Narayanappa G. 2021. A Novel L1 Linker Mutation in DES Resulted in Total Absence of Protein. *J Mol Neurosci*. 71: 2468-2473.

15. Vohra M, Sharma AR, **Satyamoorthy K**, Rai PS. 2021. Pharmacogenomic considerations for repurposing of dexamethasone as a potential drug against SARS-CoV-2 infection. *Per Med.* 18: 389-398.
16. Shetty MG, Pai P, Deaver RE, **Satyamoorthy K**, Babitha KS. 2021. Histone Deacetylase 2 selective inhibitors: A versatile therapeutic strategy as next generation drug target in cancer therapy. *Pharmacological Research* 170: 105695
17. Andrade MJ, Van Lonkhuyzen DR, Upton Z, **Satyamoorthy K**. 2021. RPA facilitates rescue of keratinocytes from UVB radiation damage through insulin-like growth factor-I signalling. *J Cell Sci.* 134: jcs255786.
18. Pujari I, Thomas A, Jinsu T, Niharika J, Guruprasad KP, Rai PS, **Satyamoorthy K**, Babu VS. 2021. Cytotoxicity and radiosensitizing potency of Moscatilin in cancer cells at low radiation doses of X-ray and UV-C, *3 Biotech* 11: 281
19. Shankaran A, Prasad K, Chaudhari S, Brand A, **Satyamoorthy K**. 2021. Advances in development and application of human organoids. *.3 Biotech.* 11: 257.
20. Prabhu BN, Kanchamreddy SH, Sharma AR, Bhat SK, Bhat PV, Kabekkodu SP, **Satyamoorthy K**, Rai PS. 2021. Conceptualization of functional single nucleotide polymorphisms of polycystic ovarian syndrome genes: an in silico approach. *Endocrinol Invest.* 44: 1783-1793.
21. Chakrabarty S, Govindaraj P, Sankaran BP, Nagappa M, Kabekkodu SP, Jayaram P, Mallya S, Deepha S, Ponmalar JNJ, Arivinda HR, Meena AK, Jha RK, Sinha S, Gayathri N, Taly AB, Thangaraj K, **Satyamoorthy K**. 2021. Contribution of nuclear and mitochondrial gene mutations in mitochondrial encephalopathy, lactic acidosis, and stroke-like episodes (MELAS) syndrome. *.J Neurol.* 268: 2192-2207.
22. Bhat S, Adiga D, Shukla V, Guruprasad KP, Kabekkodu SP, **Satyamoorthy K**. 2021. Metastatic suppression by DOC2B is mediated by inhibition of epithelial-mesenchymal transition and induction of senescence. *.Cell Biol Toxicol.* doi: 10.1007/s10565-021-09598-w.
23. Kiran KR, Swathy PS, Paul B, Prasada KS, Rao MR, Joshi MB, Rai PS, **Satyamoorthy K**, Muthusamy A. 2021. Untargeted metabolomics and DNA barcoding for discrimination of *Phyllanthus* species. *J Ethnopharmacol.* 273: 113928.
24. Devang N, Adhikari P, Nandini M, **Satyamoorthy K**, Rai PS .2021. Effect of licorice on patients with HSD11B1 gene polymorphisms- a pilot study. *J Ayurveda Integr Med.* 12: 131-135.
25. Tanwar AS, Evangelatos N, Venne J, Ogilvie LA, **Satyamoorthy K**, Brand A. 2021. Global Open Health Data Cooperatives Cloud in an Era of COVID-19 and Planetary Health. *OMICS.* 25: 169-175.
26. Warriar A, Mazumder N, Prabhu S, **Satyamoorthy K**, Murali TS. 2021. Photodynamic therapy to control microbial biofilms. *Photodiagnosis Photodyn Ther.* 33:102090
27. Ghosh S, Pattanshetty SM, Mallya SD, Pandey D, Guddattu V, Kamath VG, Kabekkodu SP, **Satyamoorthy K**, Shetty RS. 2021. Cervical cytology and associated factors among tribal women of Karnataka, India. *PLoS One.* 16: e0248963.
28. Pandey D, Yeale A, Naha R, Kuthethur R, Chakrabarty S, **Satyamoorthy K**. 2021. Mitochondrial DNA copy number variation - A potential biomarker for early onset preeclampsia. *Pregnancy Hypertens.* 23: 1-4
29. Sharma AR, Patagi S, Uk AR, Shetty R, Umakanth S, **Satyamoorthy K**, Rai PS. 2021. MirSNPs in clopidogrel metabolism genes predict cardiovascular disease risk: a case-control study and meta-analysis. *Pharmacogenomics* 22: 99-113.
30. Chaudhari S, Dey Pereira S, Asare-Warehene M, Naha R, Kabekkodu SP, Tsang BK, **Satyamoorthy K**. 2021. Comorbidities and inflammation associated with ovarian cancer and its influence on SARS-CoV-2 infection. *J Ovarian Res.* 14: 39.
31. Ghosh S, Mallya SD, Shetty RS, Pattanshetty SM, Pandey D, Kabekkodu SP, **Satyamoorthy K**, Kamath VG. 2021. Knowledge, Attitude and Practices Towards Cervical Cancer and its Screening Among Women from Tribal Population: a Community-Based Study from Southern India. *J Racial Ethn Health Disparities* 8: 88-93.
32. Thorat SA, Poojari P, Kaniyassery A, Kiran KR, **Satyamoorthy K**, Mahato KK, Muthusamy A. 2021. Red laser-mediated alterations in seed germination, growth, pigments and withanolide content of Ashwagandha [*Withania somnifera* (L.) Dunal]. *J Photochem Photobio B: Biol.* 216: 112144.
33. Pujari I, Thomas A, Rai PS, **Satyamoorthy K**, Babu VS. 2021. Cell size: a key determinant of meristematic potential in plant protoplasts. *aBIOTECH* 2: 96-104.

Benjamin K. Tsang, PhD

Director, Reproductive Biology Unit,
Professor Emeritus, University of Ottawa (uOttawa)
Professor of Obstetrics & Gynecology, Cellular & Molecular Medicine, and Health Sciences, uOttawa
Emeritus Senior Scientist, Ottawa Hospital Research Institute (OHRI)
Senior Scientist, Chronic Disease Program, OHRI

Biographic sketch

Dr. Ben Tsang completed his undergraduate training at Bemidji State University (chemistry), received MSc (Biochemistry) from the University of Iowa, and Ph.D. (Pharmacology) from the University of Ottawa. In 1980, Dr. Tsang joined the University of Ottawa as the Director, Reproductive Biology Unit and initiated a research-intensive academic program in the Department of Obstetrics and Gynaecology. He served as Associate Chair (Research) of the Department, and developed a multi-disciplinary reproductive health research program in Ottawa. As the Director of Research of the Ottawa Civic Hospital, he played a central role in research development at the Loeb Research Institute, now one of the top health research institutions in Canada and subsequently renamed the Ottawa Hospital Research Institute.

Professor Tsang is an internationally recognized ovarian biologist, who has successfully developed a translational research program in women's health. His team of basic scientists and clinical investigators address important health issues, including female infertility, ovarian cancer and pregnancy complications. Dr. Tsang's research program covers the broad area of cell fate regulation in women's reproductive health. He and his team are examining the cell signaling pathways involved in the regulation of ovarian cell survival and apoptosis and have defined the basic mechanisms governing normal ovarian follicular growth and offered important insights into the pathophysiology of polycystic ovarian syndrome. In addition, his research on the molecular and cellular basis of chemoresistance in ovarian cancer has provided key information for the development of new diagnosis and therapy for chemoresistant ovarian cancer, a most lethal cancer in women.

The success of Professor Tsang's research program is also reflected by his ability to secure continuous funding from MRC/CIHR during the past 37 years, as well as support from other peer-review funding agencies, government departments, private foundations and industries. To date, he has contributed over 225 full-length original publications and 20 reviews/book chapters and issued 4 US patents. Professor Tsang is a successful mentor to many graduate and postgraduate trainees, many of them have been award/scholarship recipients and currently hold important academic and research appointments.

Professor Tsang has received many honors and awards, including the Award of Excellence in Reproductive Medicine from the Canadian Fertility and Andrology Society, The OCRI Research Award from the Ottawa Centre for Research and Innovations, Angel Award for cancer research excellence from the Ottawa Regional Cancer Foundation, "Outstanding Alumnus" of Bemidji State University (Minnesota), the J David Grimes Research Career Achievement Award at the Ottawa Hospital Research Institute, the University of Ottawa Faculty of Medicine Award of Excellence (Research) and the Recognition Award (Medical Education). He served as President of the Canadian Fertility and Andrology Society and as a member of the Board of Directors of the Society for the Study of Reproduction and is a member of the Executive Committee of the International Society of Precision Cancer Medicine. He served on the Advisory Committee of the Cancer Research Institute, Seoul National University.

He holds honorary professorship at the Chinese Academy of Sciences, Jinan University, Nanjing Medical University and Taipei Medical University, as well as appointed World Class University Professor of Biomodulation, Seoul National University. He is Co-Editor-in-Chief of the *Journal of Ovarian Research*, Associate Editor of *Journal of Molecular Carcinogenesis*, *Journal of Cancer Prevention* and *Journal of Obstetrics and Gynecology Canada*, and served on the Editorial Board of *Biology of Reproduction*, *Endocrinology*, *Reproduction* and *Adaptive Medicine*.

Professor Tsang serves as the Co-chair of the Canada-Japan Bilateral Program on Women's Health Research and the China-Canada Bilateral Program on Reproductive Health and, in these capacities, promotes international research partnerships and academic exchanges.

Selected Book Chapters and Reviews

1. Orisaka M, Tajima K, **Tsang BK** and Kotsuji F. Oocyte-granulosa-theca cell interactions during preantral follicular development. *Journal of Ovarian Research* 2:9 (2009)
2. Ali AY, Farrand L, Kim JY, Byun S, Suh JY, Lee HJ and **Tsang BK**. Molecular determinants of ovarian cancer chemoresistance: new insights into an old conundrum. *Ann NY Acad Sci* 1271: 58-67 (2012)
3. Ali AY, Farrand L, Kim JY, Byun S, Im-Aram A, Leung EH, Suh JY, Lee HJ and **Tsang BK**. “New Perspectives in Chemoresistant Ovarian Cancer” in *Ovarian Toxicology* (2nd Edition), Taylor and Francis, LLC (2013)
4. Kong B, Tsuyoshi H, Orisaka M, Shieh DB, Yoshida Y and **Tsang BK**. Mitochondrial dynamics regulating chemoresistance in gynecological cancers. *Ann NY Acad Sci*. 1350: 1–16 (2015)
5. Asare-Werehene M, Shieh DB, Song YS and **Tsang BK**. Molecular and Cellular Basis of Chemoresistance in Ovarian Cancer. In “The Ovary” (edited E.Y. Adashi & P.C.K. Leung), 3rd Edition, Elsevier Science (2018).
6. Han CY, Patten DA, Richardson R, Harper ME, and **Tsang BK**. Tumor metabolism regulating chemosensitivity in ovarian cancer. *Genes and Cancer* 9: 155-175 (2018)
7. Chaudhari S, Pereira SD, Asare-Werehene M, Naha R, Kabekkodu SP, **Tsang BK** and Satyamoorthy K. Comorbidities and inflammation associated with ovarian cancer and its influence on SARS-CoV-2 infection. *Journal of Ovarian Research* 14:39 (2021); doi.org/10.1186/s13048-021-00787-z
8. Chen ZL, Zhang C, Jiu Y, Xin X, Li HM, Wang YP, **Tsang BK**, Zhang QH. Challenges and opportunities for ovarian cancer management in the epidemic of Covid-19: Lessons learned from Wuhan, China. *Journal of Ovarian Research* 14(1): (2021). DOI: 10.1186/s13048-021-00784-2

Selected Full Length Papers in Refereed Journals (Career Total: 237)

1. Hunter RA, Asare-Werehene M., Mandour A. **Tsang BK** and Anis H. Determination of Chemoresistance in Ovarian Cancer by Simultaneous Quantification of Exosomes and Exosomal Cisplatin with Surface Enhanced Raman Scattering. *Sensors and Actuators B: Chemical* (2021, <https://doi.org/10.1016/j.snb.2021.131237>).
2. Colina JA, Zink KE, Eliadis K, Salehi R, Gargus ES, Wagner SR, Moss KJ, Baligod S, Li KL, Kirkpatrick BJ, Woodruff TK, **Tsang BK**, Sanchez LM, Burdette JE. Fallopian tube derived tumor cells induce testosterone secretion from the ovary, increasing epithelial proliferating and invasion. *Cancers* (2021, 13, 1925; <https://doi.org/10.3390/cancers13081925>).
3. Han CY, Patten DA, Kim SI, Lim JJ, Chan D, Siu MKY, Han YJ, Carmona E, Parks R, Lee C, Lu Z, Chan KKL, Ku JL, Macdonald EA, Vanderhyden B, Mes-Masson A-E, Ngan HYS, Cheung A, Song YS, Bast RC, Jr, Harper M-E, and **Tsang BK**, Nuclear hexokinase II-phospho-p53 interaction is determinant and potential biomarker for in ovarian cancer. *Cancers* (2021 13, 3399. <https://doi.org/10.3390/cancers13143399>).
4. Abdullah N, Tamimi Y, Dobretsov S, AlBalushi N, Alshekaili J, Al Balushi H, AlKindi M, Hassan SI, Al Bahlani S, **Tsang BK**, Burney IA. Malformin-A1 (MA1) sensitizes chemoresistant ovarian cancer cells to Cisplatin-induced apoptosis. *Molecules* (2021 26, 3624; <https://doi.org/10.3390/molecules26123624>).
5. Chiu CT, Wang PW, Asare-Werehene M, **Tsang BK**, and Shieh DB. Circulating Plasma Gelsolin: A Predictor of Favorable Clinical Outcomes in Head and Neck Cancer and Sensitive Biomarker for Early Disease Diagnosis Combined with Soluble Fas Ligand. *Cancers* (2020, 12(6), 1569; <https://doi.org/10.3390/cancers12061569>).
6. Huang H, Tong TT, Wang JR, Lai MH, Zhang CR, Wen XH, Li SN, Li KY, Liu JQ, Ma HX, **Tsang BK** and Jiang ZH. Chemerin isoform analysis in human biofluids using an LC/MRM-MS-based targeted proteomics approach with stable isotope-labeled standard. *Analytica Chimica Acta* 1139: 79-87. PMID 33190712 DOI: 10.1016/j.aca.2020.08.062: 0.84 (2020)

7. Asare-Werehene M, Communal L, Carmona E, Han YJ, Song YS, Burger D, Mes-Masson AM and **Tsang BK**. Plasma Gelsolin inhibits CD8+ T cell function and regulates glutathione production in ovarian cancer chemoresistance. *Cancer Research* 80:3959–3971 (2020).
8. Salehi R, Mazier HL, Nivet A-L, Reunov AA, Lima P, Wang Q, Fiocco A, Isidoro C and **Tsang BK**. Role of mitochondrial dynamics and cell death in an androgen-induced rat model for polycystic ovarian syndrome and its regulation by gonadotropin. *Scientific Reports* doi.org/10.1038/s41598-020-57672-w (2019).
9. Han YJ, Kim BY, Cho UT, Park IS, Kim SI, Dhanasekaran D, **Tsang BK**, and Song YS. Mitochondrial fission causes cisplatin resistance under hypoxic conditions via ROS in ovarian cancer cells. *Oncogene* doi.org/10.1038/s41388-019-0949-5 (2019)
10. Asare-Werehene M, Communal L, Carmona E, Le T, Provencher D, Mes-Masson AM and **Tsang BK**. Pre-operative Circulating Plasma Gelsolin Predicts Residual Disease and Stage One Ovarian Cancer. *Scientific Reports*. doi.org/10.1038/s41598-019-50436-1 (2019)
11. Asare-Werehene M, Nakka K, Reunov A, Communal L, Chiu CT, Lee W, Abedini MR, Wang PW, Carmona E, Shieh DB, Le T, Mes-Masson AM, Dilworth J, Burger D and **Tsang BK**. The Exosome-Mediated Autocrine and Paracrine Role of Plasma Gelsolin (pGSN) in Ovarian Cancer Chemoresistance. *Oncogene* doi.org/10.1038/s41388-019-1087-9 (2019)
12. Han CY, Patten DA, Lee SG, Chan DW, Harper M-E, and **Tsang BK**. p53 promotes chemoresponsiveness by regulating Hexokinase II gene transcription and metabolic reprogramming in epithelial ovarian cancer. *Molecular Carcinogenesis*. Doi.org/10.1002/mc.23106 (2019).
13. Hao DP, Li JJ, Wang JL, Meng Y, Zhao ZQ, Zhang C, Wang L, Deng CX, **Tsang BK**, Wang L and Di LJ. Estrogen signaling is associated with chemo-sensitivity in ovarian cancer via genome-wide collaboration with CtBP. *Theranostics* 9: 3952-3965. doi: 10.7150/thno.30814 (2019)
14. Siu MKY, Jiang YX, Wang JJ, Leung THY, Han CY, **Tsang BK**, Cheung ANY, Ngan HYS, Chan KKL Hexokinase 2 regulates ovarian cancer cell migration, invasion and stemness via FAK/ERK1/2/MMP9/NANOG/SOX9 signaling cascades. *Cancer* doi.org/10.3390/cancers11060813 (2019)
15. Zhang YZ, Han CY, Fan XX, Yao XJ, Parks RJ, Liu L **Tsang BK**, Leung ELH P53 sensitizes chemoresistant non-small cell lung cancer via elevation of ROS and suppression of EGFR/PI3K/Akt signaling. *Cancer Cell International* 19:188 doi.org/10.1186/s12935-019-0910-2 (2019)
16. Lima PDA, Nivet A-L, Wang Q, Chen YA, Leader A, Cheung A, Tzeng CR and **Tsang BK**. Polycystic ovary syndrome: possible involvement of androgen-induced, chemerin-mediated ovarian recruitment of monocytes/macrophages. *Biol Reprod*. 99: 838–852 (2018).
17. Shieh DB, Hwu JR, Tsai TL, Yeh CS, Su WC, Lee WT and **Tsang BK**. Sequence specific gene scission and editing on demand in vitro and in vivo: The photonic gene eraser. *Cryobiology*: 232-233(2018)
18. Momenpouri A, Lima PDA, Chen YA, Tzeng CR, **Tsang BK** and Anis H. Surface-enhanced Raman scattering for the detection of polycystic ovary syndrome. *Biomedical Optics Express* 9: 801-817 (2018)
19. Kenigsberg S, Lima PA, Lackan C, El-rass R, Meghan L, Teichert AM, Moskovtsev S, Cheung ANY, **Tsang BK** and Librach CL. Gene Expression Pattern of the Human Maestro (MRO) gene. *PLOS One*. doi.org/10.1371/journal.pone.017487 (2017)
20. Lim JJ, Lima PA, Salehi R, Lee DR and **Tsang BK**. Regulation of androgen receptor signaling by ubiquitination in folliculogenesis and its dysregulation in polycystic ovarian syndrome. *Scientific Reports*. 7: 10272 | DOI:10.1038/s41598-017-09880-0 (2017)

21. Lim JJ, Han CY, Lee DR and **Tsang BK**. RNF6 mediates androgen-induced granulosa cell proliferation and follicle growth via modulation of androgen receptor signaling. *Endocrinology* 158: 993–1004 (2017)
22. Zhang D, Piao HL, Yan-HongLi, Qiu Q, Li DJ, Du MR, **Tsang BK**. Inhibition of AKT sensitizes chemoresistant ovarian cancer cells to cisplatin by abrogating S and G2/M arrest. *Exp. Mol. Pathol.* 100: 506-513 (2016).
23. Chan DW, Hui WWY, Wang JW , Hui LMN, Liang RR, Yung MMH, Thomas HY Leung THY, Chan KKL, Yao KM, **Tsang BK** and Ngan HS. DLX1 acts as a critical player of FOXM1 promoting ovarian cancer aggressiveness via modulating TGF- β 1/SMAD4 signaling. *Oncogene* doi: 10.1038/onc.2016.307 (2016)
24. Kim BY, Kim HS, Kim S, Haegeman G, **Tsang BK**, Dhanasekaran D and Song YS. Adipose stromal cells from visceral and subcutaneous fat facilitate migration of ovarian cancer via IL-6/JAK2/STAT3 pathway. *Cancer Research and Treatment*. doi: 10.4143/crt.2016.175 (2016)
25. Tang M, Huang C, Wang YF, Ren PG, Xiao TX, Wang BB, Pan YF, **Tsang BK**, Zabel BA, Ma BH, Zhao H, Zhang JV. CMKLR1 deficiency maintains ovarian steroid production in mice treated chronically with dihydrotestosterone. *Scientific Report*. doi: 10.1038/srep2132 (2016)
26. Seo JA, Kim BY, Dhanasekaran DN, **Tsang BK** and Song YS. Curcumin induces apoptosis by inhibiting sarco/endoplasmic reticulum Ca²⁺ ATPase activity in ovarian cancer cells. *Cancer Letters* 371: 30-37 (2016).
27. Kim BY, Jung EJ, Lee YK, Lee JY, **Tsang BK**, Lim JM and Song YS. Curcumin Induces ER Stress-mediated Apoptosis through Selective Generation of Reactive Oxygen Species in Cervical Cancer Cells. *Molecular Carcinogenesis* 55: 918-928 (2016)
28. Sanguine B, Shin SH, Lee EJ, Lee JH, Lee SY, Farrand L, Jung SK, Cho YY, Um SJ, Sin HS, Kwon YJ, Zhang CJ, **Tsang BK**, Bode1 AM, Lee HJ, Lee KW and Dong ZG. The retinoic acid derivative, ABPN, inhibits pancreatic cancer through induction of Nrdp1. *Carcinogenesis* 36:1580-1589 (2015)
29. Abedini MR, Wang PW, Huang YF, Cao MJ, Chou CY, Shieh DB and **Tsang BK**. Cell Fate Regulation by Gelsolin in Human Gynecologic Cancers. *Proc. Nat. Acad. Sci. USA* 111:14442-14447 (2014).
30. Xue K, Kim JY, Liu JY, and **Tsang BK** Insulin-like 3-induced Rat Preantral Follicular Growth is mediated by Growth Differentiation Factor 9. *Endocrinology* 155: 156–167, 2014 (2014)
31. Farrand L, Kim JY, Byun S, Im-Aram A, Lee JH, Lee KW, Suh JY, Lee HJ and **Tsang BK**. Hirsutenone sensitizes chemoresistant ovarian cancer cells to cisplatin via modulation of apoptosis inducing factor and X-linked inhibitor of apoptosis protein. *J Biol Chem* 289: 1723-1731 (2014)
32. Wang PW, Abedini MR, Yang LX, Ding AA, Figeys D, Chang JY, **Tsang, BK** and Shieh DB. Gelsolin Regulates Chemosensitivity in Human Head-and-Neck Cancer. *Int. J Cancer*. 135:2760-2759. (2014)
33. Kong B, Wang, Q, Fung E, Xue K and **Tsang BK**. p53 is required for cisplatin-induced, Oma1-mediated L-Opa1 Processing and Mitochondrial Fission in OVCA cells. *J. Biol Chem* 289:27134-27145 (2014)
34. Wang Q, Leader A and **Tsang BK**. Inhibitory role of prohibitin and chemerin in FSH-induced rat granulosa cell steroidogenesis. *Endocrinology* 154: 956-967 (2013).
35. Du MR, Qiu Q, Gruslin A, Gordon J, Li DJ and **Tsang BK**. SB225002 promotes mitotic catastrophe in chemosensitive and –resistant ovarian cancer cells independent of p53 status in vitro. *PLOS ONE* 8 (1): e54572 (2013)
36. Han YY, Xia GL and **Tsang BK**. Regulation of Cyclin D2 Expression and Degradation by Follicle Stimulating Hormone during Rat Granulosa Cell Proliferation in vitro. *Biol Reprod*. 88: 1-11 (2013)
37. Kim JY, Xue K, Wang Q, Liu JY, Leader A, Han JY and **Tsang BK**. Chemerin suppresses ovarian follicular development and its potential involvement in follicular arrest in rats treated chronically with dihydrotestosterone. *Endocrinology* 154: 2912–2923 (2013).

BIOGRAPHICAL SKETCH

NAME: Dr. Padmalatha S Rai

eRA COMMONS USER NAME (credential, e.g., agency login): PADMALATHARAI

POSITION TITLE: Professor

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Mangalore University, Mangalore, India	BSc	06/1989	Chemistry/Zoology/Botany
Mangalore University, Mangalore, India	MSc	06/1991	Biosciences (Genetics)
Bangalore University, Bangalore, India	PhD	12/1999	Zoology

A. PERSONAL STATEMENT

Dr. Padmalatha S Rai is currently working as Professor and Associate Director (Academics) at Manipal School of Life Sciences (MSLS), MAHE, Manipal, India. She is also Heading the Department of Biotechnology at MSLS, MAHE. During her 30 years of teaching and research, she has published 85 research articles in international peer-reviewed journals, authored three book chapters, presented 85 papers in National and International conferences, and was awarded one patent. Seven students have been awarded Ph.D. under her guidance, and 04 students are currently working for their doctoral degree under her guidance. She is part of ongoing research activities funded by DBT, ICMR, and DST, Government of India at MSLS, MAHE

B. POSITIONS AND HONORS

06/2016-till date: Associate Director (Academics), Manipal Academy of Higher Education, Manipal, India

01/2015-till date: Head of Biotechnology Department, Manipal Academy of Higher Education, Manipal, India

04/2011-till date: Professor, Manipal Academy of Higher Education, Manipal, India

09/2006-04/2011: Associate Professor, Manipal Academy of Higher Education, Manipal, India

09/2002-04/2006: Assistant Professor, Manipal Academy of Higher Education, Manipal, India

11/1992-09/2002: Lecturer, Kuvempu University, Shimoga, India

C. CONTRIBUTIONS TO SCIENCE

During 30 years of teaching and research carrier, Dr. Padmalatha S Rai has published over 85 research articles in international peer-reviewed journals, authored three book chapters, presented 85 papers in National and international conferences, awarded one patent. 07 students have been awarded Ph.D. under her guidance, and 04 students are currently working for their doctoral degrees. She is part of ongoing research activities funded by DBT, ICMR, and DST, Government of India at MSLS, MAHE.

- I. The focus areas of her research currently include:
 - i. Multi-omics of metabolic disorders such as type 2 diabetes, cardiovascular disease, and polycystic ovarian syndrome and pharmacogenomics of type 2 diabetes and cardiovascular.
 - ii. To translate clinically relevant biomarkers for diagnostic, prognostic, and therapeutic use and development of cost-effective techniques for SNP detection, which can be used for point of care diagnostics
 - iii. To develop species-specific markers for authentication of herbal plants in ayurvedic formulations and curation of medicinal plant data-base

D. ADDITIONAL INFORMATION: RESEARCH SUPPORT AND/OR SCHOLASTIC PERFORMANCE

i. Contributions to science (publications from last five years):

1. Pujari I, Thomas A, Rai PS, Satyamoorthy K, Babu VS. In vitro bioproduction and enhancement of moscatilin from a threatened tropical epiphytic orchid, *Dendrobium ovatum* (Willd.) Kraenzl. 3 Biotech. 2021 Dec;11(12):1-20.
2. Banerjee S, Prabhu Basrur N, Rai PS. Omics technologies in personalized combination therapy for cardiovascular diseases: challenges and opportunities. *Personalized Medicine*. 2021 Nov;18(6):595-611.
3. Vinay CM, Udayamanoharan SK, Prabhu Basrur N, Paul B, Rai PS. Current analytical technologies and bioinformatic resources for plant metabolomics data. *Plant Biotechnology Reports*. 2021 Oct;15(5):561-72.
4. Pujari I, Thomas A, Rai PS, Satyamoorthy K, Babu VS. Cell size: a key determinant of meristematic potential in plant protoplasts. *aBIOTECH*. 2021 Jan 1:1-9.
5. Kiran KR, Swathy PS, Paul B, Prasada KS, Rao MR, Joshi MB, Rai PS, Satyamoorthy K, Muthusamy A. Untargeted metabolomics and DNA barcoding for discrimination of *Phyllanthus* species. *Journal of Ethnopharmacology*. 2021 Jun 12;273:113928.
6. Vohra M, Sharma AR, Satyamoorthy K, Rai PS. Pharmacogenomic considerations for repurposing of dexamethasone as a potential drug against SARS-CoV-2 infection. *Personalized Medicine*. 2021 Apr(0).
7. Prabhu BN, Kanchamreddy SH, Sharma AR, Bhat SK, Bhat PV, Kabekkodu SP, Satyamoorthy K, Rai PS. Conceptualization of functional single nucleotide polymorphisms of polycystic ovarian syndrome genes: an in silico approach. *Journal of Endocrinological Investigation*. 2021 Jan 27:1-1. 7.
8. Sharma AR, Razak UK, Shetty R, Umakanth, Shashikiran U, Satyamoorthy K, Rai PS. mirSNPs in genes involved with Clopidogrel metabolism and their impact on risk of Cardiovascular Disease: A Case-Control study and Meta-Analysis. *Pharmacogenomics*; 2020.
9. Khan NG, Correia J, Adiga D, Rai PS, Dsouza HS, Chakrabarty S, Kabekkodu SP. A comprehensive review on the carcinogenic potential of bisphenol A: clues and evidence. *Environmental Science and Pollution Research*. 2021 Mar 5:1-21.
10. Pujari I, Thomas A, Thomas J, Jhawar N, Guruprasad KP, Rai PS, Satyamoorthy K, Babu VS. Cytotoxicity and radiosensitizing potency of Moscatilin in cancer cells at low radiation doses of X-ray and UV-C. 3 Biotech. 2021 Jun;11(6):1-5.
11. N Devang, P Adhikari, M Nandini, K Satyamoorthy, PS Rai. Effect of licorice on patients with HSD11B1 gene polymorphisms-a pilot study. *Journal of Ayurveda and Integrative Medicine*. 2020
12. Vohra M, Sharma AR, Prabhu BN, Rai PS. SNPs in sites for DNA methylation, transcription factor binding, and miRNA targets leading to allele-specific gene expression and contributing to complex disease risk: a systematic review. *Public Health Genomics*. 2020 Sep 23:1-6.
13. Vohra M, Adhikari P, Nagri SK, Umakanth S, Satyamoorthy K, Rai PS. CpG-SNP site methylation regulates allele-specific expression of MTHFD1 gene in type 2 diabetes. *Laboratory Investigation*. 2020 Apr 1:1-2.
14. Sharma AR, Vohra M, Shukla V, Guddattu V, Shetty R, Umakanth S, Satyamoorthy K, Rai PS. Coding SNPs in hsa-miR-1343-3p and hsa-miR-6783-3p target sites of CYP2C19 modulates clopidogrel response in individuals with cardiovascular diseases. *Life Sciences*. 2020 Mar 15;245:117364.
15. Sharma AR, Shashikiran U, Uk AR, Shetty R, Satyamoorthy K, Rai PS. Aberrant DNA methylation and miRNAs in coronary artery diseases and stroke: a systematic review. *Briefings in functional genomics*. 2020 Jul;19(4):259-85.
16. Deepika VB, Vohra M, Mishra S, Dorai K, Rai PS, Satyamoorthy K, Murali TS. DNA demethylation overcomes attenuation of colchicine biosynthesis in an endophytic fungus *Diaporthe*. *Journal of Biotechnology*. 2020 Nov 10;323:33-41.
17. Phani NM, Vohra M, Kakar A, Adhikari P, Nagri SK, D'Souza SC, Shashikiran U, Satyamoorthy K, Rai PS. Implication of critical pharmacokinetic gene variants on therapeutic response to metformin in Type 2 diabetes. *Pharmacogenomics*. 2018; doi: 10.2217/pgs-2018-0041.
18. Vohra M, Sharma AR, Paul B, Bhat M, Satyamoorthy K, Rai PS. In Silico Characterization of Functional Single Nucleotide Polymorphisms of Folate Pathway Genes. *Annals of Human Genetics*. 2018; 82: 186-199
19. Devang N, Satyamoorthy K, Rai PS, Nandini M, Basu A, Adhikari P. Association of HSD11B1 rs12086634 and HSD11B1 rs846910 gene polymorphisms with polycystic ovary syndrome in South Indian women. *International Journal of Diabetes in Developing Countries*. 2018 Oct 1;38(4):381-6.

20. Phani NM, Vohra M, Adhikari P, Nagri SK, Shashikiran U, D'Souza SC, Kalluri PR, Satyamoorthy K, Rai PS. Genetic Variants Identified from GWAS for Predisposition to Type 2 Diabetes Predict Sulfonylurea Drug Response. *Current molecular medicine*. 2017;17(8):580-586.
21. Rai PS, Thangaraj K, Satyamoorthy K. Screening for recessive diseases-A valuable investment for future generations of South Asia. *Research Reports* 2017; 1(1).
22. Bellampalli R, Vohra M, Sharma K, Bhaskaranand N, Bhat KG, Prasad K, Sharma AR, Satyamoorthy K, Rai PS. Acute lymphoblastic leukemia and genetic variations in BHMT gene: Case-control study and computational characterization. *Cancer Biomarkers*. 2017; 19(4) 393-401
23. Devang N, Satyamoorthy K, Rai PS, Nandini M, Rao S, Phani NM, Adhikari P. Association of HSD11B1 gene polymorphisms with type 2 diabetes and metabolic syndrome in South Indian population. *Diabetes research and clinical practice* 2017; 131:142-8.
24. Bhat MK, Gadekar VP, Jain A, Paul B, Rai PS, Satyamoorthy K. 1-CMDb: A Curated Database of Genomic Variations of the One-Carbon Metabolism Pathway. *Public Health Genomics*. 2017 May 17. (DOI:10.1159/000475805)
25. Muthusamy A, Sanjay ER, Prasad HN, Rao MR, Joshi BM, Rai SP, Satyamoorthy K. Quantitative Analysis of Phyllanthus Species for Bioactive Molecules Using High-Pressure Liquid Chromatography and Liquid Chromatography–Mass Spectrometry. *Proceedings of the National Academy of Sciences, India Section B: Biological Sciences*. 2017:1-2.
26. Thomas A, Pujari I, Shetty V, Joshi MB, Rai PS, Satyamoorthy K, Babu VS. Dendrobium protoplast co-culture promotes phytochemical assemblage in vitro. *Protoplasma*. 2017 Jul 1;254(4):1517-28.

BIOGRAPHICAL SKETCH

NAME: Krishna Kishore Mahato

POSITION TITLE: Professor & Head, Manipal School of Life Sciences, MAHE, Manipal

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE	Completion Date MM/YYYY	FIELD OF STUDY
Ranchi University, Ranchi	BSc	June/1989	Phys, Che., Maths (Phys Honours)
Banaras Hindu University, Varanasi	MSc	July/1991	Solid State Physics
Banaras Hindu University, Varanasi	PhD	October/1998	Laser Spectroscopy

A. Personal Statement

Dr. K K Mahato, Professor, and Head at the Department of Biophysics, Manipal School of Life Sciences, Manipal Academy of Higher Education (MAHE), Manipal, India. Trained in Solid State Physics, he obtained his Ph.D. in Laser Spectroscopy from Banaras Hindu University, Varanasi, India in the year 1998. The focus areas of his research include, application of laser spectroscopy tools (fluorescence, photoacoustic, and Raman spectroscopy) in biology and medicine, low-level laser therapy (LLLT) for tissue regeneration involving *in vitro* and *in vivo* models, and developing various optical instrumentations for early detection of diseases. Further, he is also involved in developing fluorescence and photoacoustic spectroscopy-based imaging tools for optical pathology as well as autofluorescence-based instrumentations to understand protein structures and functions and for protein fingerprinting. His team also works on the synthesis and characterization of aromatic amino acid-based PLGA (Poly(lactic-co-glycolic acid)) nano-composites as a contrast agent for optical signal enhancement. In addition, he is also looking into the feasibility of using Light-emitting diodes (LEDs) as an alternative source of light in spectroscopy applications.

B. Positions and Honors

Sl No.	Institution/Place	Position	From (date)	To (date)
1	Manipal School of Life Sciences, MAHE, Manipal	Professor and Head	2015	Till date
2	Manipal School of Life Sciences, MAHE, Manipal	Professor	2012	2015
3	Manipal School of Life Sciences, MAHE, Manipal	Associate Professor	2007	2012
4	Center for Laser Spectroscopy, Kasturba Medical College, Manipal, MAHE, Manipal	Assistant Professor	2002	2007
5	Indian Institute of Technology, Kanpur	Project Scientist	1999	2002

MEMBERSHIPS IN PANELS, BOARDS, AND INDIVIDUAL SCIENTIFIC REVIEWING ACTIVITIES

- ✓ Doctoral Advisory Committee member of Manipal School of Life Sciences, Manipal Academy of Higher Education.
- ✓ Doctoral Advisory Committee member of Manipal Institute of Technology, Manipal.
- ✓ Doctoral Advisory Committee member of Kasturba Medical College, MAHE.
- ✓ Doctoral Advisory Committee member of Manipal College of Health Professions, MAHE.
- ✓ Member of Board of Studies, Manipal School of Life Sciences, MAHE.
- ✓ Reviewer of Project proposal for DBT, Govt of India
- ✓ Reviewer of Project proposal for DST, Govt of India
- ✓ Reviewer of Project proposal for SERB, DST, Govt of India
- ✓ Reviewer of manuscript for various Scientific journals of repute

MEMBERSHIPS OF SCIENTIFIC SOCIETIES

- ✓ Member of the Optica (Formerly known as the Optical Society of America).
- ✓ Member of American Society of Laser Medicine & Surgery (ASLMS)
- ✓ Member of SPIE, USA
- ✓ Member of Laser Spectroscopy Society of India
- ✓ Member of the Society of Biological Chemists-India
- ✓ Member of Society for Mitochondrial Research and Medicine (SMRM)-India

C. Contributions to Science (Selected recent publications)

- Govindaraju I, Zhuo GY, Chakraborty I, Melanthota SK, Mal SS, Sarmah B, Baruah VJ, **Mahato KK**, Mazumder N. Investigation of structural and physico-chemical properties of rice starch with varied amylose content: A combined microscopy, spectroscopy, and thermal study. *Food Hydrocolloids*. 2022 Jan 1;122:107093.
- Raghushaker CR, Rodrigues J, Nayak SG, Ray S, Urala AS, Satyamoorthy K, **Mahato KK**. Fluorescence and Photoacoustic Spectroscopy-Based Assessment of Mitochondrial Dysfunction in Oral Cancer Together with Machine Learning: A Pilot Study. *Analytical chemistry*. 2021 Dec 14.
- Rodrigues J, Amin A, Raghushaker CR, Chandra S, Joshi MB, Prasad K, Rai S, Nayak SG, Ray S, **Mahato KK**. Exploring photoacoustic spectroscopy-based machine learning together with metabolomics to assess breast tumor progression in a xenograft model ex vivo. *Laboratory Investigation*. 2021 Jul;101(7):952-65.
- Swathy PS, Kiran KR, Joshi MB, **Mahato KK**, Muthusamy A. He-Ne laser accelerates seed germination by modulating growth hormones and reprogramming metabolism in brinjal. *Scientific reports*. 2021 Apr 12;11(1):1-6.
- Thorat SA, Poojari P, Kaniyassery A, Kiran KR, Satyamoorthy K, **Mahato KK**, Muthusamy A. Red laser-mediated alterations in seed germination, growth, pigments and withanolide content of Ashwagandha [*Withania somnifera* (L.) Dunal]. *Journal of Photochemistry and Photobiology B: Biology*. 2021 Mar 1;216:112144.
- Darshan C.M., Joshi V.K., and **Mahato KK**, Light Emitting Diodes (LEDs) in Fluorescence-based Analytical Applications: A Review. *Applied Spectroscopy Reviews*, 2020, (DOI:10.1080/05704928.2020.1835939)
- Sailendra Tiwari, Somshakher Bhat and **Mahato KK**, Design and fabrication of low-cost microfluidic channel for biomedical application, *Scientific Reports* 2020, 10(1), 9215
- Prabhu V, Rao BS, Rao AC, Prasad K, **Mahato KK**. Photobiomodulation invigorating collagen deposition, proliferating cell nuclear antigen, and Ki67 expression during dermal wound repair in mice. *Lasers in Medical Science*. 2020 Nov 27:1-0.
- Raghushaker CR, D'Souza M, Urala AS, Ray S, **Mahato KK**. An overview of conventional and fluorescence spectroscopy tools in oral cancer diagnosis. *Lasers in Dental Science*. 2020 Nov 19:1-3.
- Bathini M, Raghushaker CR, **Mahato KK**. The Molecular Mechanisms of Action of Photobiomodulation Against Neurodegenerative Diseases: A Systematic Review. *Cellular and Molecular Neurobiology*. 2020 Dec 10:1-7
- Harsh Ranawat, Nirmal Mazumder, Thokur Sreepathy Murali, **Mahato KK** & Kapaettu Satyamoorthy. Deciphering biophysical signatures for microbiological applications. *Lasers in Medical Science*. 2020 Dec. 35: 1493–1501.
- Chandavalli R. Raghushaker, Subhash Chandra, Sanjiban Chakraborty, Shama P. Kabekkodu, Kapaettu Satyamoorthy, **Mahato KK**. Detection of mitochondrial dysfunction in vitro by laser-induced autofluorescence. *J. Biophotonics*. 2019 Nov. 12 (11): e201900056.

BIOGRAPHICAL SKETCH

NAME: **Dr. Manjunath B Joshi**

POSITION TITLE: **Associate Professor**

Contact email: Manjunath.joshi@manipal.edu

Contact Mobile: +91 9742561236; Linked in: <https://www.linkedin.com/in/manjunath-joshi-ba483215/>

ORCID ID: 0000-0002-1310-5480

Scholarly Citation index: **Citations: 2360; h-index: 21; i10 index: 31**

EDUCATION/TRAINING (*Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.*)

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Gulbarga University, Gulbarga	BSc	1995-1998	Microbiology, Zoology & Chemistry
Gulbarga University, Gulbarga	MSc	1998-2000	Biotechnology
University of Basel, Basel	PhD	2003-2007	Medicinal Biology

A. Personal Statement

Dr. Manjunath B Joshi obtained master's degree in Biotechnology from Gulbarga University, Gulbarga (2000) and underwent research training as junior research fellow in Center for Cellular and Molecular Biology, Hyderabad, India (2001-2003). Dr. Joshi received PhD from Basel University, Switzerland (2007) in Medicinal Biology and subsequently, completed post-doctoral training in Department of Biomedicine, University Hospital, Basel (2007-2011) in the area of signal transduction. He obtained both doctoral and post-doctoral training with Prof. Therese Resink at University Hospital, Basel. Dr. Joshi joined Manipal School of Life Sciences, MAHE, Manipal as assistant professor (2011-2016) and currently working as Associate Professor (2016-Present). Dr. Joshi teaches molecular cell biology and immunology related courses for bachelors and master's degree programs and also coordinate PhD program at school. Research team of Dr. Joshi aims to understand signaling mechanisms at the interface between innate immune system and metabolism in Type 2 Diabetes. His other research interest involves understanding angiogenesis in several diseases. The lab has also set up a mass spectrometry facility for metabolomics and protein analysis using ESI-QTOF. Dr. Joshi has authored more 55 research articles in peer reviewed national and international journals including European Heart Journal, Molecular Biology and Evolution, Cardiovascular Research, Journal of Investigative Dermatology, Journal of Biological Chemistry, FASEB Journals, Scientific Reports, Cellular Signaling, Biochemical Journal, BBA, FEBS Letters and etc.

B. Positions and Honors

August 2016-Present	Associate Professor Manipal School of Life Sciences, Manipal Academy of Higher Education, Manipal, India.
August 2011-August 2016	Assistant Professor Manipal School of Life Sciences, Manipal Academy of Higher Education, Manipal, India.
July 2007- July 2011	Post-Doctoral Fellow Department of Biomedicine, University Hospital, Basel
April 2001-Oct 2003	Project Junior Research Fellow Centre for Cellular and Molecular Biology, Hyderabad, India.

C. Contributions to Science

We have identified mechanisms regulating (dys)function of neutrophils in Type 2 Diabetes

Our studies aim to decipher the cellular and signaling mechanisms at the interface of innate immune system and metabolism in Type 2 Diabetes (T2D) and its consequences such as stroke and recurrent infections. Precisely, in human and mouse neutrophils, we are understanding how metabolites such as glucose, homocysteine and Trimethyl oxide induce extracellular traps (NETs) and contributes to either recurrent infections in diabetes or thrombosis in stroke. We have demonstrated hyperglycemic conditions in T2D induce metabolic reprogramming in neutrophils leads to decreased levels of NADPH and glutathione which subsequently results in impeded response to pathogens to form NETs. Our studies have also shown homocysteine accelerates glucose induced NETs and facilitates platelet activation/aggregation causing thrombosis in the context of stroke.

1. Joshi MB, Kamath A, Nair A, Pooja YT, Sriranjini SJ , Gangadharan GG, Satyamoorthy K. Modulation of neutrophil (dys)function by Ayurvedic herbs and its potential influence on SARS-CoV-2 infection. 2021. *Journal of Ayurveda and Integrative Medicine*. 2022.13(1):100424
2. Joshi MB*, Ahamed R, Hegde M, Nair AS, Lingadakai R, Satyamoorthy K. Glucose induces metabolic reprogramming in neutrophils during type 2 diabetes to form constitutive extracellular traps and decreased responsiveness to lipopolysaccharides. *Biochim Biophys Acta Mol Basis Dis*. 2020; 165940. *Corresponding author.
3. Bharath Prasad AS, Padival S, Prabhu V, Cheruku S, Nayak UY, Rao, Joshi MB, Ramachandra L, Murali TS, Satyamoorthy K. *Pseudomonas aeruginosa* virulent proteins pseudolysin and protease IV impede cutaneous wound healing. 2020. *Laboratory Investigations*. 10.1038/s41374-020-00478-1.
4. Joshi MB, Baipadithaya G, Balakrishna A, Hegde M, Vohra M, Ahamed R, Nagri SK, Ramachandra L, Satyamoorthy K. 2016. Elevated homocysteine levels in type 2 diabetes induce constitutive neutrophil extracellular traps. *Sci Rep* ; 6:36362.
5. Joshi MB, Lad A, Bharat Prasad A, Balakrishnan A, Ramachandra L, Satyamoorthy K. 2013. High glucose modulates IL-6 mediated immune homeostasis through impeding neutrophil extracellular traps formation in diabetic conditions. *FEBS Lett*. 587:2241-6.
6. Gupta AK*, Joshi MB*, Hasler P, Erne P, Hahn S, Resink TJ. 2010. Activated endothelial cells induce neutrophil extracellular traps and are susceptible to NETosis-mediated cell death. *FEBS Lett*. 584:3193-7. *Equal contribution.

In vascular endothelial cells, we are understanding a) influence of inflammatory mediators (IL-6) on epigenetic modifications in the context of metabolic memory, vascular insulin resistance and tumor angiogenesis and b) cellular signaling involved in development of atherosclerosis.

1. Keerthana B, Medishetti R, Behera P, Kanika K, Joshi MB, Samineni R, Katika MR, Challa A, Chatti K and Parsa K. PHLPP1 promotes lipid accumulation in foam cells and a zebrafish larval model of atherosclerosis through AMPK/ChREBP dependent lipid uptake and fatty acid synthesis pathways. 2022. *iScience (in press)*

2. Vasistha Sampara, Shahsikiran U, Adiga P, Joshi MB. Extrinsic and intrinsic factors influencing metabolic memory in Type 2 Diabetes. 2022. *Vascular Pharmacology*. 142:106933.
3. Hegde M, Bhat SM, Guruprasad KP, Moka R, Ramachandra L, Satyamoorthy K, Joshi MB. Human breast tumor derived endothelial cells exhibit distinct biological properties 2021. *Biology of the Cell*. (*In press*)
4. Bhat SM, Badiger VA, Vasishta S, Chawla J, Prasad SS, Ghosh S, Joshi MB. 3D tumor angiogenesis models: Recent advances and challenges. 2021. *Journal of cancer research and clinical oncology*. 147(12):3477-3494.
5. Bhat SK, Joshi MB, Vasistha S, Arni RK, K Satyamoorthy. Metalloproteinase-1 and L-amino acid oxidases from Bothrops species inhibit angiogenesis. 2021. *Journal of Venomous Animals and Toxins including Tropical Diseases* 18;27:e20200180.
6. Hegde M, Joshi MB. Comprehensive analysis of regulation of DNA methyltransferase isoforms in human breast tumors. 2021. *Journal of cancer research and clinical oncology*. 147(4):937-971.
7. Hegde M, Guruprasad KP, Ramachandra L, Satyamoorthy K, Joshi MB. IL-6 Mediated Epigenetic Control of VEGFR2 Induce Disorganized Angiogenesis in Human Breast Tumors. *Journal of Biological Chemistry*. 2020. 295(34):12086-12098.
8. Kumar P, Paramasivam G, Devasia T, Prakashini K, Megha A, Nayak K, Joshi MB, Moka R. Primary Cardiac Involvement in the Rare Ile73Val Transthyretin Mutation - A Case Series. 2020. *Circulation: Genomic and Precision Medicine*. 13(3):e002792.
9. Das S, Joshi MB, Guruprasad KP, Rao BS. Stimulation of cytoprotective autophagy and components of mitochondrial biogenesis/proteostasis in response to ionizing radiation as a credible pro-survival strategy. 2020. *Free Radical Biology and Medicine*. 20;152:715-727.
10. Balakrishnan AS, Guruprasad KP, Kapaettu S, Joshi MB. 2018. Interleukin-6 determines stabilization of DNA methyltransferases and alters DNA promoter methylation of genes associated with insulin signaling and angiogenesis. *Lab Investigation*. 98:1143-1158.
11. S K Bhat, Joshi MB, A Ullah, R Masood, S G Biligiri, R K Arni, K Satyamoorthy. 2016. Serine proteinases from Bothrops atrox and Bothrops brazili facilitate angiogenesis upon inducing PI3K/Akt signaling axis. *Toxicon* 15;124:63-72.
12. Seenappa V, Das B, Joshi MB, Satyamoorthy K. 2016. Context dependent regulation of human phosphoenolpyruvate carboxykinase isoforms by DNA promoter methylation and RNA stability. *J Cell Biochem*. 117(11):2506-20.
13. Frismantiene, A, Pfaff, D., Frachet A., Coen, M., Joshi, MB., Maslova K., Bochaton-Piallat ML, Erne P, Resink TJ & Philippova, M. (2014). Regulation of contractile signaling and matrix remodeling by T-cadherin in vascular smooth muscle cells: Constitutive and insulin-dependent effects. *Cell Signal* 26:1897-908.
14. Ellmann L, Joshi MB, Resink TJ, Bosserhoff A and Kuphal S. 2012. BRN-2 is a transcriptional repressor of CDH-13 (T-cadherin) in melanoma cells. *Lab Invest*. 92:1788-800.
15. Kyriakakis E, Maslova K, Philippova M, Pfaff D, Joshi MB, Buechner SA, Erne P and Resink TJ. 2012. T-cadherin is an auxiliary negative regulator of EGFR pathway activity in cutaneous squamous cell carcinoma: impact on cell motility. *J Invest Dermatol*. 132: 2275-85.
16. Joshi MB*, Philippova M*, Pfaff D, Kyriakakis E, Maslova K, Erne P and Resink TJ. 2012. T-cadherin attenuates insulin-dependent signaling, eNOS activation and angiogenesis in vascular endothelial cells. *Cardio Vasc Res*. 93:498-507. * Equal Contribution.
17. Philippova M, Suter Y, Toggweiler S, Schoenenberger AW, Joshi MB, Kyriakakis E, Erne P, Resink TJ. 2011. T-cadherin is present on endothelial microparticles and is elevated in plasma in early atherosclerosis. *Eur Heart J*. 32:760-71.
18. Kyriakakis E, Philippova M, Joshi MB, Pfaff D, Bochkov V, Afonyushkin T, Erne P, Resink TJ. 2010. T-cadherin attenuates the PERK branch of the unfolded protein response and protects vascular endothelial cells from endoplasmic reticulum stress-induced apoptosis. *Cell Signal*. 22:1308-16.
19. Joshi MB, Kyriakakis E, Pfaff D, Rupp K, Philippova M, Erne P, Resink TJ. 2009. Extracellular cadherin repeat domains EC1 and EC5 of T-cadherin are essential for its ability to stimulate angiogenic behaviour of endothelial cells. *FASEB J*. 23:4011-21.
20. Philippova M, Joshi MB, Kyriakakis E, Pfaff D, Erne P, Resink TJ. 2009. A guide and guard: the many faces of T-cadherin. *Cell Signal*. 21:1035-44.
21. Resink TJ, Philippova M, Joshi MB, Kyriakakis E, Erne P. 2009. Cadherins and cardiovascular disease. *Swiss Med Wkly*. 139:122-34.

22. Joshi MB, Ivanov D, Philippova M, Kyriakakis E, Erne P, Resink TJ. 2008. A requirement for thioredoxin in redox-sensitive modulation of T-cadherin expression in endothelial cells. *Biochem J.* 416:271-80.
23. Philippova M, Ivanov D, Joshi MB, Kyriakakis E, Rupp K, Afonyushkin T, Bochkov V, Erne P, Resink TJ. 2008. Identification of proteins coassociating with atypical GPI-anchored T-cadherin on the surface of vascular endothelial cells: the role for Grp78/BiP in T-cadherin-dependent cell survival. *Mol Cell Biol.* 28:4004-17.
24. Ghosh S*, Joshi MB*, Ivanov D, Feder-Mengus C, Spagnoli GC, Martin I, Erne P, Resink TJ. 2007. Use of multicellular tumor spheroids to dissect endothelial cell-tumor cell interactions: a role for T-cadherin in tumor angiogenesis. *FEBS Lett.* 581:4523-8* Equal contribution.
25. Joshi MB, Ivanov D, Philippova M, Erne P, Resink TJ. 2007. Integrin-linked kinase is an essential mediator for T-cadherin-dependent signaling via Akt and GSK3 β in endothelial cells. *FASEB J.* 21:3083-95.
26. Joshi MB, Philippova M, Ivanov D, Allenspach R, Erne P, Resink TJ. 2005. T-cadherin protects endothelial cells from oxidative stress-induced apoptosis. *FASEB J.* 19:1737-9.

We have set up LC-MS facility for metabolomics and protein analysis

We have established metabolomics facility along with associated analytical softwares and databases and undertake projects related to health & disease; plant biology; toxicology and synthetic chemistry.

1. Puthanvila SS, Kodsara RK, Joshi MB, Mahato KK, Annamalai AM. He-Ne laser accelerates seed germination by modulating growth hormones and reprogramming metabolism in brinjal. 2021. *Scientific Reports.* 11(1):7948.
2. Rodrigues J, Amin A, Raghushaker CR, Chandra S, Joshi MB, K, Rai S, Nayak SG, Ray S, Mahato KK. Exploring photoacoustic spectroscopy-based machine learning together with metabolomics to assess breast tumor progression in a xenograft model ex vivo. 2021. *Laboratory Investigations.* 101(7):952-965.
3. Puthanvila SS, Kodsara RK, Nagaraja MP, Bobby P, Kabekkodu S, Mattu RR, Joshi MB, Rai PS, Satyamoorthy K, Annamalai AM. Untargeted metabolomics and DNA barcoding for discrimination of *Phyllanthus* species. 2021. *Journal of Ethnopharmacology.* 12;273:113928.
4. Joshi MB*, Ahamed R, Hegde M, Nair AS, Lingadakai R, Satyamoorthy K. Glucose induces metabolic reprogramming in neutrophils during type 2 diabetes to form constitutive extracellular traps and decreased responsiveness to lipopolysaccharides. *Biochim Biophys Acta Mol Basis Dis.* 2020; 165940.
5. Mani MS, Joshi MB, Puranik A, Kabekkodu SP, D'Souza HS. Lead exposure induces metabolic reprogramming in rat models. *Toxicology Letters.* 2020. S0378-4274(20)30420-3
6. Kumar A, Chawla K, Thakur R, Joshi MB, Satyamoorthy K, Bisht D. Proteomic analysis of circulating immune complexes from tuberculosis patients. 2019. *J Pure Appl Microbiol,* 13(2).
7. Joshi MB, Pai S, Balakrishnan A, Bhat M, Kotambail A, Sharma P, Satyamoorthy K. Evidence of perturbed metabolic patterns in bipolar disorder patients associated with lithium responsiveness. 2019. *Psychiatry Res.* 11;273:252-259.
8. Siddaramaiah M, Rao BS, Joshi MB, Datta A, Sandya S, Vishnumurthy V, Chandra S, Nayak SG, Satyamoorthy K, Mahato KK. Interrogation of an autofluorescence based method for protein fingerprinting. *J Biophotonics.* 2018 11(8):e201700393.
9. Thomas A, Pujari I, Shetty V, Joshi MB, Rai PS, Satyamoorthy K, Babu VS. 2017. *Dendrobium* protoplast co-culture promotes phytochemical assemblage in vitro. *Protoplasma.* 254(4):1517-28.
10. Raghu KS, Shamprasad BR, Kabekkodu SP, Paladhi P, Joshi MB, Valiathan MS, Guruprasad KP, Satyamoorthy K. 2017. Age dependent neuroprotective effects of medhya rasayana prepared from *Clitoria ternatea* Linn. in stress induced rat brain. *J Ethnopharmacol.* 197:173-83.
11. Muthusamy A, Sanjay ER, Prasad NHN, Rao RM, Joshi, MB, Rai P, Satyamoorthy, K. 2017. Quantitative Analysis of *Phyllanthus amarus* and *Phyllanthus urinaria* for Bioactive Molecules using High-Pressure Liquid Chromatography and Liquid Chromatography–Mass Spectrometry. *Proc. Natl. Acad. Sci., India, Sect. B Biol. Sci.*
12. S K Bhat, Joshi MB, A Ullah, R Masood, S G Biligiri, R K Arni, K Satyamoorthy. 2016. Serine proteinases from *Bothrops atrox* and *Bothrops brazili* facilitate angiogenesis upon inducing PI3K/Akt signaling axis. *Toxicon* 15;124:63-72.
13. Udupi V, Guruprasad KP, Gopinath PM, Acharya RV, Vidya P, Nayak J, Ganesh R; Rao J, Shree R, Raghu KS, Joshi MB, Paladhi P, Varier PM, Muraleedharan K, Sankaran T, Satyamoorthy K. 2016. Effect of amalaki rasayana on DNA damage and repair in aged human individuals. *J Ethanopharmacol.*

D. Additional Information: Research Support and/or Scholastic Performance

1. Life Member for following societies:

- a. Society of Biological Chemists
- b. The Society for Mitochondria Research and Medicine, India
- c. Environmental mutagenesis society of India

2. Awards & Recognitions

- a. Travel award by European society of cardiology for oral presentation at European Society of cardiology meeting, Vienna, September 2007
- b. Visiting Faculty for Erasmus Mundus Program, Biohealth Computing (BioHC), Joseph Fourier University, Grenoble. 24th August-7th September, 2013.
- c. Best poster award: Indo-US symposium on "Mass spectrometry based metabolomics in disease biology" Trivandrum, India. January 2014.
- d. Best Research Award: Dr. TMA Pai Gold medal-2016, MAHE, Manipal

3. Patents

- a. Satyamoorthy K, Manjunath B Joshi, Shreesha Bhat, Raghuvir Arni, Selthur Govind Biligiri. Peptides for promoting angiogenesis and a method of synthesizing the same. Patent number 355125 (Government of India).
- b. Krishna kishore Mahato, Manjunath Siddaramaiah , Kapaettu Satyamoorthy , Manjunath B. Joshi , Anirbit Datta , Subhash Chandra. Identification of proteins in unstained page (1d and 2d) by laser induced auto fluorescence (Indian patent filed).

4. Ongoing Research Projects

1. Epigenetic regulation of exosome proteins in Type 2 Diabetes: Implications in understanding metabolic memory. 2021-2024. DHR-ICMR, Government of India. Role: PI
2. Crosstalk between metabolism and innate immune responses during steady state and emergency granulopoiesis in Type 2 Diabetes: Implications in combating infections. (2020-2023) Department of Biotechnology, Government of India. Role: PI.
3. Understanding neutrophil (dys)function in Type 2 Diabetes: Implications in combating infections. Intramural Funding, MAHE, Manipal. (2019-2022) Role: PI.
4. Investigating metabolic reprogramming in stroke as a consequence of homocysteine induced bidirectional activation of neutrophils and platelets. (2018-2022) SERB, Department of Science and Technology, Government of India. Role: PI.
5. Exosomes in pulmonary arterial hypertension with and without exposure to exercise. (2019-2022) Indian Council for Medical Research, Government of India. Role: Co-PI.
6. Development of therapeutic humanized antibodies against IL-6R and gp130 for breast cancer treatment. (2019-2021). Indian Council for Medical Research, Government of India. Role: Co-PI.
7. Understanding the functional role of co-activator binding protein PIMT in adipogenesis and obesity (2020-2023) Department of Biotechnology, Government of India. Role: Co-PI.

Completed Research Projects

1. Epigenetic changes in endothelial cells due to stromal interactions: consequence in tumor angiogenesis. (2015-2019). Pilot project, Cancer biology grant, Department of Biotechnology, Government of India. Role: PI. 24.0 Lakhs
2. Functional and structural characterization of snake venom proteins from Bothrops atrox with angiogenic potential. Indo-Brazil Project, Department of Biotechnology. Co-PI (2015-2018).
3. Design and expression of Humanized antibody against soluble IL6R & GP130 in bacteria and animal cell line (DBT-BIRAP) Co-PI (2012-2015).

BIOGRAPHICAL SKETCH

NAME: Nirmal Mazumder

POSITION TITLE: Assistant Professor

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Guwahati University, Assam, India	B.Sc.	06/2007	Physics
Tezpur University, Assam, India	M.Sc.	07/2009	Physics
National Yang-Ming University, Taipei, Taiwan	Ph.D.	09/2013	Biophotonics

A. Personal Statement: Dr. Nirmal Mazumder received his Master of Science in Physics from Tezpur University, India in 2009. He obtained his Ph.D. degree in 2013 from National Yang Ming Chiao Tung University, Taiwan. He worked as post-doctoral research associate at University of Virginia, USA and Italian Institute of Technology, Genoa, Italy during 2013 to 2016. In 2016, he joined the Department of Biophysics, Manipal School of Life Sciences, Manipal Academy of Higher Education, Manipal, India as an Assistant Professor. His research interests include development of microscopy-spectroscopy techniques, biomedical devices, biophotonics, smart materials, microfluidics and its biomedical applications. His research work generated several publications in peer-reviewed journals and in conference proceedings, 5 books, 15 book chapters, and several poster/oral/invited presentations in National and International conferences. Dr. Nirmal is working on several projects funded by Government of India as Principal Investigator. He is also working as the reviewer/guest editors/associate editors in several prestigious journals.

B. Positions and Honors

06/2016-Till: Assistant Professor, Department of Biophysics, Manipal School of Life Sciences, MAHE, Manipal, India

11/2014-05/2016: Department of Nanophysics and NeuroBrain Technology, Italian Institute of Technology, Genoa, Italy

11/2013-06/2014: KCCI, Department of Biology, University of Virginia, USA

C. Contributions to Science

During the past 13 years Dr. Nirmal is working in the area of development of optical microscope and its biomedical applications. He had developed wavefront-sensorless adaptive optics based two-photon fluorescence microscopy for brain imaging during his post-doctoral work at Italian Institute of Technology, Italy. He was working on various nonlinear optical microscopy such as 2p-FLIM, SHG, CARS microscopy. He has demonstrated that using CARS microscopy, the expression of domain 2 of the HCV core protein (D2) fused to a GFP is sufficient to induce an accumulation of larger lipid droplets in the perinuclear region. Additionally, fluorescence lifetime imaging of endogenous reduced nicotinamide adenine dinucleotides [NAD(P)H], are performed, a key coenzyme in cellular metabolic processes, to monitor changes in the cofactor's abundance and conformational state in D2-GFP transfected cells. He developed a four-channel photon counting based Stokes-polarimeter for spatial characterization of polarization effects in second harmonic generation (SHG) and report on measurements and characterization of polarization properties of SH signals. The technique is used as contrast mechanism to characterize the polarization properties from two potassium dihydrogen phosphate (KDP) micro-crystals, collagen type-I and starch granules in SHG microscopy. This technique can be applied to investigate the molecular orientation and the degree of organization in fibrotic collagen, human dermis, keloid, cornea, microtubules as well as myosin of the skeletal muscle. His research interests relate to development of Stokes-Mueller based light microscopy for tissue characterization and deep learning. He is working on the applications of optics and photonics in food sciences, development of medical devices.

Publications (Last 3 years): Total citation: 563, H-index: 14, i10index: 24 (Google Scholar),

- Ishita Chakraborty, Pooja N, Sib Sankar Mal, Uttam C. Paul, Md. Hafizur Rahman, N. Mazumder*, "An Insight into the Gelatinization Properties Influencing the Modified Starches Used in Food Industry: A Review" Food and Bioprocess Technology (Accepted). IF: 4.4
- Mridula Sunder, Kamallesh D Mumbrekar, N. Mazumder*, "Gamma Radiation as a Modifier of Starch – Physicochemical Perspective" Current Research in Food Science 5, 141-149 (2022). <https://doi.org/10.1016/j.crfs.2022.01.001>

- Ishita Chakraborty, Sintu Rongpipi, Indira G, Rakesh B, Sib Sankar Mal, Esther W. Gomez, Enrique D. Gomez, Ranjan Dutta Kalita, Yuthika Nath, N. Mazumder*, "An insight into microscopy and analytical techniques for morphological, structural, chemical, and thermal characterization of cellulose" *Microsc Res Tech.* (Accepted). IF: 2.7
- Aditi Sengupta, Ishita Chakraborty, Indira G, N. Mazumder*, "An insight into the physicochemical characterisation of starch-lipid complex and its importance in food industry" *Food Reviews International* (Accepted). IF: 6.4
- Soumyabrata Banik, Ashwini Uchil, Tenzin Kalsang, Sanjiban Chakrabarty, Md. Azahar Ali, Pornsak Srisungsitthisunti, Krishna Kishore Mahato, Salvatore Surdo, N. Mazumder* "The revolution of PDMS microfluidics in cellular biology" *Critical Reviews in Biotechnology* (Accepted). IF: 8.5
- Aathma Merin Bejoy, Kausalya Neelavara Makkithaya, Bhagesh Basavraj Hunakunti, Anarghya Hegde, Keerthana Krishnamurthy, Aparajita Sarkar, Carol Felcita Lobo, D V S Keshav, Dharshini G, Dhivya Dharshini S, Selinda Mascarenhas, Shweta Chakrabarti, Sree Raja Rajeswari Devi Kalepu, Bobby Paul, N. Mazumder*, "An Insight on Advances and Applications of 3D Bioprinting: A Review" *Bioprinting*, 24,e00176 (2021). <https://doi.org/10.1016/j.bprint.2021.e00176>
- Sparsha Pallen, Yuthika Shetty, Subir Das, Joel Markus Vaz, N. Mazumder*, *Advances in Nonlinear Optical Microscopy Techniques for in vivo and in vitro Neuroimaging*, *Biophysical Reviews* (In press). 10.1007/s12551-021-00832-7
- M. Monisha, Vinod Hegde, Sindhoora Kaniyala Melanthota, N. Mazumder, M. I. Sayyed, Hanan Al-Ghamdi, Aljawhara H. Almuqrin, Sudha D. Kamath, Photoluminescence studies on dysprosium doped glass ceramics containing α -Na₃AlF₆ crystalline phase for white light emission, *Materials Chemistry and Physics*, 274, 125157 (2021) <https://doi.org/10.1016/j.matchemphys.2021.125157>. IF: 4.4
- Indira Govindaraju, Guan-Yu Zhuo, Ishita Chakraborty, Sindhoora Kaniyala Melanthota, Sib Sankar Mal, Bhaswati Sarmah, Vishwa Jyoti Baruah, Krishna Kishore Mahato, N. Mazumder,* Investigation of Structural and Physico-chemical Properties of Rice Starch with Varied Amylose Content: A Combined Microscopy, Spectroscopy, and Thermal study, *Food Hydrocolloids*, 122, 107093 (2022). <https://doi.org/10.1016/j.foodhyd.2021.107093>. IF: 9.1
- Ishita Chakraborty, Indira Govindaraju, Sintu Rongpipi, Krishna Kishore Mahato, N. Mazumder,* Effects of hydrothermal treatments on physicochemical properties and in vitro digestion of starch, *Food Biophysics*, 16:544–554 (2021). DOI: 10.1007/s11483-021-09687-7. IF: 3.1
- Guan-Yu Zhuo, Spandana K U, Sindhoora K M, Yury V. Kistenev, Fu-Jen Kao, Viktor V. Nikolaev, Hala Zuhayri, Natalya A. Krivova, and N. Mazumder,* Label-free Multimodal Nonlinear Optical Microscopy for Biomedical Applications, *Journal of Applied Physics*, 129, 21, 214901 (2021). Selected as cover page. <https://doi.org/10.1063/5.0036341>. IF: 3.4
- Chao-Wei Hung, N. Mazumder, Dan-Jae Lin, Wei-Liang Chen, Shih-Ting Lin, Ming-Che Chan, and Guan-Yu Zhuo, Label-free characterization of collagen crosslinking in bone-engineered materials using nonlinear optical microscopy, *Microscopy and Microanalysis*, 27 (3), 587 – 597 (2021). DOI: <https://doi.org/10.1017/S1431927621000295>. IF: 3.9
- Pranoy Sahu, N. Mazumder*, "Improving the way we see: Adaptive optics based optical microscopy for deep-tissue imaging," *Frontiers in Physics*, 9, 654868 (2021). IF: 3.1
- Soumyabrata Banik, Sindhoora Kaniyala Melanthota, Sibasish Dutta, N. Mazumder,* "Design and development of smartphone-based imaging platform using electroluminescence illumination," *Results in Optics*, 3, 100070 (2021).
- Priyasha De, Ishita Chakraborty, Bhargavi Karna, N. Mazumder,* "Brief review on repurposed drugs and vaccines for possible treatment of COVID-19", *European Journal of Pharmacology*, 898, 173977 (2021). IF: 3.4
- Soumyabrata Banik, Sindhoora Kaniyala Melanthota, Arbaaz, Joel Markus Vaz, Vishak Madhwaraj Kadambalithaya, Iftak Hussain, Sibasish Dutta, N. Mazumder,* "Recent Trends in Smartphone-based Detection for Biomedical Applications: a review", *Analytical and Bioanalytical Chemistry*, 413:2389–2406 (2021). <https://doi.org/10.1007/s00216-021-03184-z>. IF: 4.1
- Talitha Kurian, Soumyabrata Banik, Dharshini Gopal, Shweta Chakrabarti, N. Mazumder*, "Elucidating Methods for Isolation and Quantification of Exosomes: a review", *Molecular Biotechnology*, 63:249–266 (2021). <https://doi.org/10.1007/s12033-021-00300-3>. IF:2.7

- Mridula Sunder, Neha Acharya, Smitha Nayak, N. Mazumder*, Optical spectroscopy and microscopy techniques for assessment of neurological diseases, *Applied Spectroscopy Reviews*, 56, 8-10, 764-803 (2021). <https://doi.org/10.1080/05704928.2020.1851237>. IF: 5.0
- Anjali Warriar, N. Mazumder, Sudharshan Prabhu, Kapaettu Satyamoorthy, Thokur Sreepathy Murali, Photodynamic therapy to control biofilm infections, *Photodiagnosis and Photodynamic Therapy*, 33, 102090 (2021). IF: 2.7
- Vishwa Jyoti Baruah, Rasana Paul, Dhruvajyoti Gogoi, N. Mazumder, Subrata Chakraborty, Aparoop Das, Tapan Kumar Mondal, Bhaswati Sarmah, Integrated Computational Approach towards Discovery of Multi-targeted Natural Products from Thumbai (*Leucas aspera*) for attuning NKT cells, *Journal of Biomolecular Structure & Dynamics* (In press). <https://doi.org/10.1080/07391102.2020.1844056>. IF:2.5
- N. Mazumder* and Fu-Jen Kao, "Stokes-Polarimetry based Second Harmonic Generation Microscopy for Collagen and Skeletal Muscle Fiber Characterization", *Lasers in Medical Science* 36:1161–1167 (2021). <https://doi.org/10.1007/s10103-020-03144-6> . IF:2.9
- Indira Govindaraju, Ishita Chakraborty, Vishwa Jyoti Baruah, Bhaswati Sarmah, Krishna Kishore Mahato, N. Mazumder*, "Structure and Morphological Properties of Starch Macromolecule using Biophysical Techniques", *Starch – Starke*, 73, 2000030 (2021). <https://doi.org/10.1002/star.202000030>. IF:3.1
- M. Monisha, N. Mazumder, G. Lakshminarayana, Soumen Mandal, Sudha D. Kamath, "Energy transfer and luminescence study of Dy³⁺ doped zinc-aluminoborosilicate glasses for white light emission," *Ceramics International* 47, 598–610 (2021). <https://doi.org/10.1016/j.ceramint.2020.08.167> . IF:4.1
- Sreeshna Jagadeesan, Indira Govindaraju, N. Mazumder*, "An insight into the ultrastructural and physiochemical characterization of potato starch: A review," *Am. J. Potato Res.* 97:464–476 (2020). <https://doi.org/10.1007/s12230-020-09798-w> . IF:1.5
- Sindhoora Kaniyala Melanthota, Soumyabrata Banik, Ishita Chakraborty, Sparsha Pallen, Dharshini Gopal, Shweta Chakrabarti, N. Mazumder*, "Elucidating the microscopic and computational techniques to study the structure and pathology of SARS-CoVs," *Microsc Res Tech.* 83:1623–1638 (2020). <https://doi.org/10.1002/jemt.23551>. IF:2.7
- Soumyabrata Banik, Krishna Kishore Mahato, Andrea Antonini, N. Mazumder*, "Development and Characterization of Portable Smartphone-based Imaging Device," *Microsc Res Tech.* 83:1336–1344 (2020). <https://doi.org/10.1002/jemt.23525>. IF:2.7
- Indira Govindaraju, Sparsha Pallen, Suchitta Umashankar, Sib Sankar Mal, Sindhoora Kaniyala Melanthota, Dhani Ram Mahato, Guan-Yu Zhuo, Krishna Kishore Mahato, N. Mazumder*, "Microscopic and Spectroscopic Characterization of Rice and Corn Starch," *Microsc Res Tech.* 83:490–498, (2020). IF:2.7
- Anushka Ojha, Soumyabrata Banik, Sindhoora K M, N. Mazumder*, "Light emitting diode (LED) based Fluorescence Microscopy for Tuberculosis Detection: A review," *Lasers in Medical Science*, 35:1431–1437, (2020). IF:3.1
- Harsh Ranawat, N. Mazumder, Thokur Sreepathy Murali, Krishna Kishore Mahato, Kapaettu Satyamoorthy, "Deciphering Biophysical Signatures for Microbiological Applications," *Lasers in Medical Science* 35:1493–1501 (2020). IF:3.1
- Ishita Chakraborty, Sparsha P, Yuthika Shetty, Niranjana Roy N. Mazumder*, "Advanced Microscopy Techniques for Revealing Molecular Structure of Starch Granules," *Biophys. Rev* 12, 105–122, (2020). <https://doi.org/10.1007/s12551-020-00614-7>
- Pranoy Sahu, N. Mazumder*, "Advances in Adaptive Optics Based Two-Photon Fluorescence Microscopy for Brain Imaging," *Lasers in Medical Science*, 35: 317–328, (2020). IF:3.1
- N. Mazumder*, Naveen K Balla, Guan-Yu Zhuo, Rajesh Kumar, Fu-Jen Kao, Yury V Kistenev, Sophie Brasselet, Viktor V Nikolaev, Natalya A. Krivova, "Label-free Nonlinear Multimodal Optical Microscopy – Basics, Development and Applications," *Frontiers in Physics*, 7:170, (2019). IF:3.1
- Harsh Ranawat, Sagnik Pal, N. Mazumder*, "Recent Trends in Two-Photon Auto-fluorescence Lifetime Imaging (2P-FLIM) and its Biomedical Applications," *Biomedical Engineering Letters* 9:293–310, (2019). <https://doi.org/10.1007/s13534-019-00119-7>
- Spandana K U, K K Mahato, N. Mazumder*, "Polarization-Resolved Stokes-Mueller Imaging: A Review of Technology and Applications," *Lasers in Medical Science* 34:1283–1293, (2019). IF:3.1
- Ankur Gogoi, N. Mazumder, Surajit Konwer, Harsh Ranawat, Nai-Tzu Chen, Guan-Yu Zhuo, "Enantiomeric recognition and separation by chiral nanoparticles," *Molecules* 24, 1007, (2019). (equal contribution). IF:3.5

BIOGRAPHICAL SKETCH

NAME: Sanjiban Chakrabarty

POSITION TITLE: Assistant Professor

EDUCATION/TRAINING (*Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.*)

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Bangalore University	BSc	05/2002	Microbiology
Manipal Academy of Higher Education-India	MSc	05/2005	Biochemistry
Manipal Academy of Higher Education-India	PhD	07/2013	Human Genetics

A. Personal Statement

Dr. Sanjiban Chakrabarty, Assistant Professor at the Department of Cell and Molecular Biology, Manipal School of Manipal Academy of Higher Education (MAHE). Trained in biochemistry, he obtained his PhD in human genetics from MAHE in 2013. Afterwards he was a postdoctoral fellow on microfluidic organ-on-chip (OoC) technology and its application in breast cancer patient therapy response at Dr. Dik van Gent's lab (Erasmus MC), in collaboration with Delft University of Technology and BI/OND, and Dr. Jos Jonkers, Netherlands Cancer Institute, The Netherlands funded by the Dutch Cancer Foundation (KWF) (Chakrabarty et al., 2020, manuscript under review). He received an Australia Awards Fellowship in collaboration with the University of Sydney in 2017. He is a Life Member of the Society of Biological Chemists, India, member of the Executive Committee of the Society for Mitochondrial Research and Medicine-India (SMRM), Life Member of the Environmental Mutagen Society of India, and Member of the European Association for Cancer Research (EACR). His research interest includes genomics and transcriptome-based analysis of chemoresistance in breast cancer. He is also involved in molecular diagnostics of genetic disorders at MSLS, MAHE, Manipal. He has co-authored 42 research articles in international peer reviewed journals and has 2 patents. He has 1 extramural research project as principal investigator funded by DST-SERB, Govt. of India at MSLS, MAHE, Manipal.

B. Positions and Honors

SI No.	Institution/Place	Position	From (date)	To (date)
1	Manipal School of Life, Sciences, MAHE	Assistant Professor	23-09-2013	Present
2	Erasmus University Medical Center, The Netherlands	Postdoctoral fellow	01-05-2018	31-12-2019
3	ThermoFisher Scientific, India	Application scientist	01-02-2013	20-09-2013
4	Manipal Life Sciences Centre, MAHE	Senior Research Fellow	01-02-2009	31-11-2012
5	Manipal Life Sciences Centre, MAHE	Research fellow	01-05-2007	01-02-2009
6	Manipal Acunova Ltd.	Scientist	01-09-2005	31-04-2007

MEMBERSHIPS IN PANELS, BOARDS, AND INDIVIDUAL SCIENTIFIC REVIEWING ACTIVITIES

- ✓ Doctoral Advisory Committee member of Manipal School of Life Sciences, Manipal Academy of Higher Education.
- ✓ Doctoral Advisory Committee member of JIPMER, Puducherry.
- ✓ Editorial Manager: Public Health Genomics Journal (2015-2017)

MEMBERSHIPS OF SCIENTIFIC SOCIETIES

- ✓ Executive committee member, Society for Mitochondrial Research and Medicine, India.
- ✓ Life member of the Society of Biological Chemists and Environmental Mutagen Society of India.
- ✓ Member of the European Association for Cancer Research (EACR).
- ✓ Coordinator of MAHE Erasmus MC Joint Center on Genome Stability (MECGS).

C. Contributions to Science

List of publications and patents

<https://scholar.google.co.in/citations?user=18ekTNcAAAAJ&hl=en>
citations: 550, h-index: 14, i10-index: 16

Chakrabarty S, Quiros-Solano WF, Kuijten MM, et al. A microfluidic cancer-on-chip platform predicts drug response using organotypic tumor slice culture [published online ahead of print, 2021 Dec 6]. *Cancer Res.* 2021;canres.0799.2021.

Paes Dias, M., Tripathi, V., van der Heijden, I., Cong, K., Manolika, E. M., Bhin, J., Gogola, E., Galanos, P., Annunziato, S., Lieftink, C., Andújar-Sánchez, M., **Chakrabarty, S.**, Smith, G., van de Ven, M., Beijersbergen, R. L., Bartkova, J., Rottenberg, S., Cantor, S., Bartek, J., Ray Chaudhuri, A., ... Jonkers, J. (2021). Loss of nuclear DNA ligase III reverts PARP inhibitor resistance in BRCA1/53BP1 double-deficient cells by exposing ssDNA gaps. *Molecular cell*, 81(22), 4692–4708.e9.

Bonora E, **Chakrabarty S**, Kellaris G, et al. Biallelic variants in LIG3 cause a novel mitochondrial neurogastrointestinal encephalomyopathy. *Brain.* 2021;144(5):1451-1466.

Chakrabarty S, Govindaraj P, Sankaran BP, et al. Contribution of nuclear and mitochondrial gene mutations in mitochondrial encephalopathy, lactic acidosis, and stroke-like episodes (MELAS) syndrome. *J Neurol.* 2021;268(6):2192-2207. doi:10.1007/s00415-020-10390-9

Naha, R., Anees, A., **Chakrabarty, S.**, Naik, P. S., Pandove, M., Pandey, D., & Satyamoorthy, K. (2020). Placental mitochondrial DNA mutations and copy numbers in intrauterine growth restricted (IUGR) pregnancy. *Mitochondrion*, 55, 85–94. <https://doi.org/10.1016/j.mito.2020.08.008>

Chakrabarty S, S.B. Savantre, C. Ramachandra Bhat, K. Satyamoorthy. “Multiple genetic mutations implicate spectrum of phenotypes in Bardet-Biedl syndrome”. *Gene.* 2020; 725:144164. doi: 10.1016/j.gene.2019.144164.

Chakrabarty S, Kumar A, Raviprasad K, Mallya S, Satyamoorthy K, Chawla K. Host and MTB genome encoded miRNA markers for diagnosis of tuberculosis. *Tuberculosis (Edinb).* 2019; 116:37-43. doi:10.1016/j.tube.2019.04.002.

Mani MS, **Chakrabarty S**, Mallya SP, Kabekkodu SP, Jayaram P, Varghese VK, Dsouza HS, Satyamoorthy K. Whole mitochondria genome mutational spectrum in occupationally exposed lead subjects. *Mitochondrion.* 2019; 48:60-66. doi: 10.1016/j.mito.2019.04.009.

Chakrabarty S, V.K. Varghese, P. Sahu, P. Jayaram, B.M. Shivakumar, C.G. Pai, Satyamoorthy K. “Targeted sequencing-based analyses of candidate gene variants in ulcerative colitis-associated colorectal neoplasia”. *British Journal of Cancer* 2017; 117:136–143. doi: 10.1038/bjc.2017.148.

Chakrabarty S, Vijayakumar N, Radhakrishnan K, Satyamoorthy K. Spastizin mutation in hereditary spastic paraplegia with thin corpus callosum. *J Neurol.* 2016; 263:2130-2. doi: 10.1007/s00415-016-8258-1.

NAME: **Meshach Asare-Werehene**POSITION TITLE: **Post-Doctoral Fellow and Part-time Academic Staff**

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE (if applicable)	COMPLETION DATE MM/YYYY	FIELD OF STUDY
Kwame Nkrumah Uni. Of Science and Tech. (Kumasi, Ghana)	B.MLS	08/2012	Laboratory Medicine
Effia-Nkwanta Regional Hospital, Ghana	Clinical Internship	08/2013	Laboratory Medicine
University of Nottingham (Nottingham, UK)	M.Sc.	12/2014	Cancer Immunotherapy
University of Ottawa (Ottawa, Canada)	Ph.D.	09/2020	Cell. and Mol. Medicine

A. Personal Statement

I am an Immuno-Oncology researcher who has received clinical and research trainings in oncology, immunology and clinical diagnosis from Ghana, UK and Canada. Through research collaborations, I have had the opportunity to visit other institutions in South Korea, Montreal, Japan and Macau making it easier for me to tolerate diversity and cross-cultural behavior. Specifically, my research is focused on the following:

1. Characterization of novel biomarkers in gynecological cancers.
2. Investigating the immunological landscape of gynecological cancers.
3. Examining the pathological role of extracellular vesicles in disease conditions.
4. Utilizing machine learning and artificial intelligence in disease diagnosis.

Using state-of-the-art cellular and molecular techniques, immunological assays, diagnostic approaches and emerging technologies like machine learning and biophotonics, I have led studies to detect novel biomarkers for early diagnosis of cancer (Meshach Asare-Werehene, et al., *Scientific Reports*, 2019), investigated novel pathways that contribute to ovarian cancer chemoresistance (Meshach Asare-Werehene, et al., *Oncogene*, 2020), revealed novel immunological pathways in ovarian cancer tumor microenvironment to enhance the efficiency of immunotherapy (Meshach Asare-Werehene, et al., *Cancer Research*, 2020) and contributed to the development of a novel switch sensor and machine learning algorithms to investigate chemoresistance and tumor pathology (Rob Hunter, Meshach Asare-Werehene, *Sensors and Actuators B: Chemical*, 2021).

B. Positions and Honors

8/2021 –

Part-Time Academic Staff – Course HSS 5901

Interdisciplinary School of Health Sciences – University of Ottawa, Ottawa, Canada

09/2020 -

Post-Doctoral Fellow Ottawa Hospital Research Institute**Advisors:** Drs. Tien Le, Hanan Anis and Benjamin Tsang**Research:** Identification of biomarkers and therapeutic targets for early diagnosis and chemoresistance in gynaecological cancers.**Clinical significance:** The outcome will help facilitate the early detection of gynaecological cancers as well as discover novel targets to enhance chemoresponsiveness.

01/2019 –

Cancer Program Lead

Tsang Lab, The Chronic Disease Program, Ottawa Hospital Research Institute (OHRI)

Honours

10/2021	Burroughs Wellcome Travel Fellowship Award – Society for the Study of Reproduction (USD 1,200)
07/2021	2021 Worton Researcher in Training Award – The Ottawa Hospital Research Institute, The Ottawa Hospital
06/2021	US National Indie Excellence Award Finalist – For my book, “The ABCs of Cancer”.
07/2020	Society for the Study of Reproduction (SSR) Trainee Travel Award (USD 200)
01/2020-	BMO Financial Group Scholarship – University of Ottawa (CAD 4,000).

C. Contributions to Science

1. Asare-Werehene M, et al., Pre-operative Circulating pGSN Predicts Residual Disease and Detects Early Stage Ovarian Cancer, *Scientific Reports*, 13924 (2019), doi:10.1038/s41598-019-50436-1.
2. Asare-Werehene M, et al., The Exosome-Mediated Autocrine and Paracrine Role of Plasma Gelsolin (pGSN) in Ovarian Cancer Chemoresistance. *Oncogene*, 2019, doi:10.1038/s41388-019-1087-9.
3. Asare-Werehene M, et al., Plasma Gelsolin Inhibits CD8+ T Cell Function and Regulates Glutathione Production in Ovarian Cancer Chemoresistance. *Cancer Research*, doi: 10.1158/0008-5472.CAN-20-0788 (2020).
4. Hunter R, **Asare-Werehene M**, Aseel Mandour, Anis H, Tsang B. Determination of chemoresistance in ovarian cancer by simultaneous quantification of exosomes and cisplatin using surface enhanced Raman scattering, *Sensors and Actuators B: Chemical* (2021). doi.org/10.1016/j.snb.2021.131237
5. **Asare-Werehene M**, Tsuyoshi H, Zhang HL, Salehi R, Carmona E, Librach CL, Mes-Masson AM, Chang CC, Burger D, Yoshida Y, Tsang BK. Plasma confers chemoresistance in ovarian cancer by resetting the relative abundance and function of macrophage subtypes, 2021. (*Under Revision at Cancer*)
6. Osman A. Dufailu, Afrakoma Afriyie-Asante, Bernard Gyan, David Adu Kwabena, Helena Yeboah, Frank Ntiakoh and **Meshach Asare-Werehene**. COVID-19 in Africa: an ovarian victory? *J Ovarian Res* **14**, **70** (2021). doi.org/10.1186/s13048-021-00820-1
7. Tsuyoshi H, Orisaka M, Fujita Y, **Asare-Werehene M**, Tsang BK and Yoshida Y. Prognostic Impact of Dynamin related protein 1 (Drp1) in Epithelial Ovarian Cancer. *BMC Cancer* **20**, 467 (2020), doi.org/10.1186/s12885-020-06965-4
8. Chiu CT, Wang PW, **Asare-Werehene M**, Tsang BK and Shieh DB. Circulating Plasma Gelsolin is a Predictor of Favourable Clinical Outcome of Head and Neck Cancer and a Sensitive Biomarker for Early Disease Diagnosis in Combination with Soluble Fas Ligand. *Cancers* 2020, 12(6), 1569, doi.org/10.3390/cancers12061569
9. Simar Chaudhari, Ritam Naha, **Meshach Asare-Werehene**, Satyajit Dey Pereira, Shama Prasada Kabekkodu, Benjamin K. Tsang and Kapaettu Satyamoorthy. Comorbidities and inflammation associated with ovarian cancer and its influence on SARS-CoV-2 infection. *J Ovarian Res* **14**, 39 (2021), doi.org/10.1186/s13048-021-00787-z
10. Reza Salehi1, Atefeh Abedini, Brandon A. Wyse, **Meshach Asare-Werehene**, Bo Pan, Alex Gutsol, Sahar Jahangiri, Kevin D. Burns, Barbara Vanderhyden, Julang Li, Dylan Burger, Clifford L. Librach and Benjamin K. Tsang. Granulosa cell-derived miR-379-5p shifts macrophage polarization towards M1: An inflammatory mechanism of polycystic ovaries, 2021 (*To be submitted to Cell Reports*).
11. **Asare-Werehene M**, Angela Crawley, Yannick Galipeau, Juthaporn Cowan , Miroslava Cuperlovic-Culf, Steffany Bennett, , Bill Cameron, Curtis Cooper, Marc-Andre Langlois, Michaeline McGuinty and Benjamin K. Tsang. Plasma gelsolin is a predictor of COVID-19 severity, death and ICU admission. 2021. (*To be submitted*).

Book Chapters:

1. **Asare-Werehene M**, Shieh DB, Song YS and Tsang BK. Molecular and cellular basis of chemoresistance in ovarian cancer. In “*The Ovary*” 3rd Edition by Leung PCK and Adashi EY, Elsevier (Academic Press), Chapter 35, 2018
2. **Asare-Werehene M** and Tsang BK. Tumor microenvironment and chemoresistance in ovarian cancer. In “*Peritoneal Tumor Microenvironment of Cancer on Cancer Hallmarks*”, Elsevier (Academic Press), 2021 (*In Press*)
3. **Asare-Werehene M**, Tsuyoshi H, Lee EYP, Chiu KWC, Ngu SF, Ngan H, Chan KKL, Yoshida Y and Tsang BK. Diagnostic, prognostic and therapeutic biomarkers of ovarian cancer. “*Peritoneal Tumor Microenvironment of Cancer on Cancer Hallmarks*”, Elsevier (Academic Press), 2021 (*In Press*)



Protected when completed

Mr. Robert Hunter

Degrees

2018/1 (2021/1)	Doctorate, PhD, University of Ottawa Degree Status: In Progress
2016/9	Master's Thesis, M.A.Sc, University of Ottawa Degree Status: Withdrawn
2011/9 - 2016/6	Bachelor's Honours, BENG, University of Guelph Degree Status: Completed

Recognitions

2018/6	KUN Prize for instrument design. National 3D printed Musical Instrument Challenge Ottawa Symphony Orchestra
2016/4	CSBE/SCGAB Foundation Undergraduate Design Project Award Canadian Society for Bioengineering
2016/1	Sunnybrook Research Prize Sunnybrook Research Institute

Employment

2015/5 - 2015/12	Research Assistant - Electrochemical Biosensors and Nanomaterials Biomedical Engineering, College of Physics and Engineering Sciences, University of Guelph
2014/1 - 2014/8	Research and Development Co-Op Student - Geopolymer Materials Gemite Products Inc.
2013/5 - 2013/8	Research Assistant - Molecular Genetics Molecular Genetics, Pharmacology and Toxicology, University of Toronto

Affiliations

The primary affiliation is denoted by (*)

(*) 2016/9 PhD Candidate, Ottawa-Carleton Institute of Biomedical Engineering, University of Ottawa

Research Funding History

Awarded [n=1]

2019/5 - 2022/4 Postgraduate Scholarships-Doctoral

Principal Applicant

Funding Sources:

Natural Sciences and Engineering Research Council of Canada (NSERC)
Postgraduate Scholarships-Doctoral
Total Funding - 63,000
Funding Competitive?: Yes

Completed [n=2]

2017/9 - 2018/8
Principal Applicant
Ontario Graduate Scholarship
Funding Sources:
Government of Ontario (Ottawa, ON)
Ontario Graduate Scholarship
Total Funding - 15,000
Funding Competitive?: Yes

2016/9 - 2017/8
Principal Applicant
NSERC CGS-M
Funding Sources:
Natural Sciences and Engineering Research Council of Canada (NSERC)
Canada Graduate Scholarships
Total Funding - 17,500
Funding Competitive?: Yes

Publications

Journal Articles

1. Robert A. Hunter, Meshach Asare-Werehene, Aseel Mandour, Benjamin K. Tsang, Hanan Anis. (2022). Determination of Chemoresistance in Ovarian Cancer by Simultaneous Quantification of Exosomes and Exosomal Cisplatin with Surface Enhanced Raman Scattering. *Sensors and Actuators B Chemical*. 354: 131237.
Accepted
2. Robert Hunter, Ali Najafi Sohi, Zohra Khatoon, Vincent R. Berthiaume, Emilio I. Alarcon, Michel Godin, Hanan Anis. (2019). Optofluidic label-free SERS platform for rapid bacteria detection in serum. *Sensors and Actuators B: Chemical*. 300: 126907.
Published
Refereed?: Yes, Open Access?: Yes
3. Robert Hunter, Hanan Anis. (2018). Genetic support vector machines as powerful tools for the analysis of biomedical Raman spectra. *Journal of Raman Spectroscopy*. 49: 1435– 1444.
Published
Refereed?: Yes
4. Murugan Veerapandian, Robert Hunter, Suresh Neethirajan. (2016). Dual immunosensor based on methylene blue-electroadsorbed graphene oxide for rapid detection of influenza virus antigen. *Talanta*. 155: 250-257.
Published
Refereed?: Yes
5. Murugan Veerapandian, Robert Hunter, Suresh Neethirajan. (2016). Ruthenium dye sensitized graphene oxide electrode for on-farm rapid detection of beta-hydroxybutyrate. *Sensors and Actuators B: Chemical*. 228: 180-184.
Published
Refereed?: Yes

- [6.](#) Murugan Veerapandian, Robert Hunter, Suresh Neethirajan. (2015). Lipxygenase-modified Ru-bpy/graphene oxide: Electrochemical biosensor for on-farm monitoring of non-esterified fatty acid. *Biosensors and Bioelectronics*. 78: 253-258.
Published
Refereed?: Yes
- [7.](#) Andrew R. Burns, Genna M. Luciani, Gabriel Musso, Rachel Bagg, May Yeo, Yuqian Zhang, Luckshika Rajendran, John Glavin, Robert Hunter, Elizabeth Redman, Susan Stasiuk, Michael Schertzberg, G. Angus McQuibban, Conor R. Caffrey, Sean R. Cutler, Mike Tyers, Guri Giaever, Corey Nislow, Andy G. Fraser, Calum A. MacRae, John Gilleard & Peter J. Roy. (2015). *Caenorhabditis elegans* is a useful model for anthelmintic discovery. *Nature Communications*. 6: 7485: 1-11.
Published
Refereed?: Yes

Name: **Fereshteh Esfandiari**
 Marital Status: **Married**
 Children: **1**
 Date of birth: **08.02.1986**
 Email address: fesfandiarinezhad@ohri.ca



□ ***Educational background:***

Degree	Major	University	Date	GPA
Ph.D	Developmental Biology	Royan Institute joint with university of science and culture, Tehran, Iran	2011-16	19.53 from 20
M.Sc	Cell and Developmental Biology	Royan Institute joint with university of science and culture, Tehran, Iran	2008-11	18.32 from 20
B.Sc	Biology	Shiraz University	2004-8	18.20 from 20

□ ***Fellowships and training courses:***

- 1) **Assisted reproductive technologies fellowship**; Sperm preparation, Sperm freezing, Oocyte and embryo freezing, IVF, ICSI, IUI, Embryo transfer, **Royan Institute, Tehran, Iran** (2016-2017)
- 2) **Advances in stem cell biology course, PASTEUR, Paris, France** (Jun 2016)

➤ ***Academic, research and clinical experiences:***

Position	Location	Duration
PostDoctoral fellow	Ottawa hospital research institute & UOttawa	July 2021- Today
Assistant Professor	Department of Stem Cells and Developmental Biology, Royan Institute for Stem Cell Biology and Technology	May 2018- Today
Maternity leave		November 2017-April 2018
Clinical fellowship for assisted reproductive technologies	Royan clinic for infertility treatment, Royan Institute for Reproductive Biomedicine, ACECR, Tehran, Iran	2016 (Nov)-2017 (Sep)
Program lead for “germ cell research”	Department of Stem Cells and Developmental Biology, Royan Institute for Stem Cell Biology and Technology	2012-2017 (May)
Research assistant	Department of Stem Cells and Developmental Biology, Royan Institute for Stem Cell Biology and Technology	2011-2015

➤ ***Professional experiences:***

➤ **Leadership experiences:**

- 1) Mentorship
- 2) Teaching & training
- 3) Write and proof the manuscripts for submitting to peer-reviewed journals

- 4) Grant application
- 5) Supervision of establishment new protocols for germ line stem cells isolation and culture in the laboratory

➤ **Organization of International conferences & workshops**

➤ **Member & organizer of scientific board**

Department of Department of Stem Cells and Developmental Biology, Royan Institute for Stem Cell Biology and Technology, 2019-2021

➤ ***Selected PUBLISHED papers in peer-reviewed Journals:***

- 1) **Fereshteh Esfandiari**, Heidar Heidari Khoei, Raha Favaedi, Maryam shahhoseini, Abbas Piryaeei, Hossein Baharvand, Disturbed Progesterone Signaling in Advanced Pre-clinical Model of Endometriosis. *Reproductive Biomedicine Online* 2021.
- 2) **Fereshteh Esfandiari**, Fereshteh Chitsazian, Masoumeh Golestan Jahromi, Raha Favaedi, Masood Bazrgar, Reza Aflatoonian, Parvaneh Afsharian, Abbas Aflatoonian, Maryam Shahhoseini. HOX cluster and their cofactors showed an altered expression pattern in eutopic and ectopic endometriosis tissues. *Reproductive Biology and Endocrinology* 2021.
- 3) Simin Yari, Heidar Heidari Khoei, Maryam Saber, **Fereshteh Esfandiari**, Ashraf Moini, Maryam Shahhoseini, Metformin attenuates expression of angiogenic and inflammatory genes in human endometriotic stromal cells, *Experimental Cell Research* 2021.
- 4) **Fereshteh Esfandiari**, Raha Favaedi, Heidar Heidari Khoei, Fereshteh Chitsazian, Simin Yari, Abbas Piryaeei, Hossein Baharvand, Hugo Vankelecom, Firouzeh Ghafari, Maryam shahhoseini*, An insight to epigenetics of human endometriosis organoids: DNA methylation analysis of HOX genes and their co-factors, *Fertility & Sterility* August 2020.
- 5) Heidari H#, **Esfandiari F#**, Piryaeei A., Rivron N. Baharvand H. Organoid technology in female reproductive biomedicine. *Reproductive Biology and Endocrinology* 2020.
- 6) **Fereshteh Esfandiari***, Nahid Mansouri, Maryam Shahhoseini, Heidar Heidari Khoei1, Hugo Vankelecom, Hossein Baharvand*. Endometriosis Organoids: Prospects and Challenges. *Reproductive Biomedicine Online*. Accepted for publication.
- 7) Bahrehbar Kh, Rezazadeh Valojerdi M, **Esfandiari F**, Fathi R, Hassani SN, Baharvand H, Human Embryonic Stem cells–derived Mesenchymal Stem Cells Restore Ovarian Function and Rescue Fertility in Mouse Model of Chemotherapy-Induced Premature Ovarian Failure, *The World of Stem Cells* 2020.
- 8) Moraveji SF, **Esfandiari F**, Taleahmad S, Nikeghbalian S, Masoudi SN, Shahverdi A, Baharvand H, Suppression of transforming growth factor- β signaling enhances spermatogonia proliferation and spermatogenesis recovery following chemotherapy, *Human Reproduction* 2020.
- 9) **Fereshteh Esfandiari**, Mohammad Kazemi Ashtiani, Mehdi Sharifi-Tabar, Maryam Saber, Hamed Daemi, Mohammad Hossein Ghanian, Abdolhossein Shahverdi, Hossein Baharvand. Microparticle-Mediated Delivery of BMP4 for Generation of Meiosis-Competent Germ Cells from Embryonic Stem Cells. *Macromolecular bioscience* 2017.
- 10) **Fereshteh Esfandiari**, Omid Mashinchian, Mohammad Kazemi Ashtiani, Mohammad Hossein Ghanian, Katsuhiko Hayashi, Amir Ata Saei, Morteza Mahmoudi, Hossein Baharvand. Possibilities in germ cell research: an engineering insight. *Trends in biotechnology* 2015.

BIOGRAPHICAL SKETCH

NAME: Shama Prasada K

eRA COMMONS USER NAME (credential, e.g., agency login): SHAMAPRASAD

POSITION TITLE: Associate Professor

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Mangalore University, Mangalore, India	B.Sc.	05/2002	Chemistry, Botany and Zoology
Mangalore University, Mangalore, India	M.Sc.	05/2004	Biosciences
Manipal Academy of Higher Education, India	Ph.D.	2011	Cancer Epigenetics

A. Personal Statement: Dr. Shama Prasada Kabekkodu obtained his Doctoral Degree in Cancer Epigenetics from Manipal Academy of Higher Education (MAHE), Manipal, India. He is currently working as an Associate professor and In-charge Head at the Department of Cell and Molecular Biology, Manipal School of Life Sciences (MSLS), MAHE, Manipal, India. During 12 years of teaching and research experience, he has published 85 articles (h-index:20, i10 index: 32, citation: 1184), 6 book chapters, 8 conference proceedings, 2 patents, and 56 invited presentations. His research interest includes understanding the epigenetic dysregulation in cancer and developing biomarkers for early screening of cancers. He is an associate editor for *Frontiers in Oncology*, *Frontiers in Genetics*, *BMC Medical Genomics*, and *PlosOne*. He is part of ongoing research activities funded by DBT, ICMR, and DST, Government of India at MSLS, MAHE. His research expertise and interest are in the area of cancer epigenetics which involves identifying the epigenetic changes responsible for carcinogenesis and translating clinically relevant biomarkers for diagnostic, prognostic, and therapeutic use, and delineating key cell and molecular events responsible for carcinogenesis. He is using cell lines, nude mice model, and genome editing technologies to understand the regulation and biological function of DNA methylation regulated genes and miRNAs in the pathophysiology of cervical cancer using molecular and biochemical approaches. His focused research area includes (i) identification and characterization of DNA methylation regulated genes in cervical cancer, (ii) deciphering the mechanism by which *DOC2B* and chromosome 14 miRNA cluster act as a tumor suppressor in cervical cancer, (iii) exposomics of Bisphenol-A and (iv) metabolic reprogramming and metastasis.

B. Contributions to Science

Our research work has led to the identification and establishment of new cancer-associated genes and pathways for early diagnosis and prognostic applications. Our group showed that genes such as *ARHGAP6*, *DAPK1*, *DOC2B*, *HAND2*, *NKX2-2*, *NNAT*, *PCDH10*, *PROX1*, *PITX2*, and *RAB6C* can be useful for early diagnosis for cervical and oral cancer of tongue (*Tumour Biol.* 2017 and *Virchows Arch.* 2017). We have shown for the first time the tumor growth regulatory function of the *DOC2B* in cervical cancer and developed a bioinformatics pipeline to analyze the bisulfite sequence data generated from the Ion torrent sequencer (*JBC.* 2014 and *Tumour Biol.* 2017). Our studies led to the identification of methylation-regulated miRNAs and their role in the pathophysiology of cervical cancer (*Mol Carcinog.* 2018, *Life Sciences* 2019, *Gynecologic Oncology*, 2019). Our study demonstrated the importance of co-methylation of CpG sites of *ZNF471* during tumor evolution with potential for diagnosis and tumor fingerprinting (*Cell biology and Toxicology*, 2021), and the role of a methylation regulated gene (*DOC2B*) in defective exocytosis, and its contribution to the acquisition of pro-metastatic phenotypes in cervical cancer (*Cell biology and Toxicology*, 2021). Our research findings identified miRNA clusters' role in cancer in general and cervical cancer in particular (*Clin Exp Metastasis*, 2020 and *Reproductive Biology*, 2021). We for the first time showed that the chromosome 14 miRNA cluster is a tumor-suppressive miRNA cluster that shows co-downregulated of 42 miRNAs by promoter methylation in cervical cancer (Unpublished data). Our study led to identifying molecular signatures for breast cancer (US Patent No. WO2011128820 A3) and colorectal cancer (Indian Patent No. 347350).

Publications (Recent): Total citation: 1184, H-index: 20, i10index: 832 (Google Scholar),

1. Supriti Ghosh, Pradyumna Jayaram, Shama Prasada Kabekkodu, Kapaettu Satyamoorthy. Targeted Drug Delivery in Cervical Cancer: Current Perspectives. *European Journal of Pharmacology*. Impact Factor:4.43.

2. Amoolya Kandettu, Divya Adiga, Vasudha Devi, Padmanaban S Suresh, Sanjiban Chakrabarty, Raghu Radhakrishnan, Shama Prasada Kabekkodu*. Deregulated miRNA Clusters in Ovarian Cancer: Diagnostic, Prognostic and Therapeutic Significance. *Genes and diseases*. (Accepted). Impact Factor: 7.1
3. Bhat S#, Kabekkodu SP#, Adiga D, Fernandes R, Shukla V, Bhandari P, Pandey D, Sharan K, Satyamoorthy K*. ZNF471 modulates EMT and functions as a methylation regulated tumor suppressor with diagnostic and prognostic significance in cervical cancer. *Cell Biol Toxicol*. 2021 Oct;37(5):731-749. doi: 10.1007/s10565-021-09582-4. #Equal Contribution. Impact Factor: 6.6.
4. Shenoy US, Adiga D, Kabekkodu SP, Hunter KD, Radhakrishnan R*. Molecular implications of HOX genes targeting multiple signaling pathways in cancer. *Cell Biol Toxicol*. 2021 Oct 6; Impact Factor: 6.6.
5. Kuthethur R, Prasad K, Chakrabarty S, Kabekkodu SP, Singh KK, Thangaraj K, Satyamoorthy K*. Advances in mitochondrial medicine and translational research. *Mitochondrion*. 2021 Nov;61:62-68. doi: 10.1016/j.mito.2021.09.008. Impact Factor: 4.16.
6. Kumblekar V, Kumarachandra R, Kabekkodu SP, Sreedhara Ranganath Pai K. Ethno pharmacological properties of *euphorbia thymifolia* (Linn.). *Medicinal Plants*. 2021 Sep;13(3):427-433.
7. Shiek SS, Mani MS, Kabekkodu SP, Dsouza HS*. Health repercussions of environmental exposure to lead: Methylation perspective. *Toxicology*. 2021 Sep;461:152927. Impact Factor: 4.2.
8. Eswaran S, Adiga D, Sriharikrishnaa S, Khan NG, Kabekkodu SP*. Comprehensive Analysis of the Exocytosis Pathway Genes in Cervical Cancer. *American Journal of the Medical Sciences* (Accepted). Impact Factor: 2.37.
9. Padam KSR, Basavarajappa DS, Shenoy US, Chakrabarty S, Kabekkodu SP, Hunter KD, Radhakrishnan R*. In silico interaction of HOX cluster-embedded microRNAs and long non-coding RNAs in oral cancer. *J Oral Pathol Med*. 2021 Aug 6. doi: 10.1111/jop.13225. Impact Factor: 4.253.
10. Shetty SS, Sharma M, Kabekkodu SP, Kumar NA, Satyamoorthy K, Radhakrishnan R*. Understanding the molecular mechanism associated with reversal of oral submucous fibrosis targeting hydroxylysine aldehyde-derived collagen cross-links. *J Carcinog*. 2021 Aug 13;20:9. doi: 10.4103/jcar.JCar_24_20. Q1
11. Bhat S, Adiga D, Shukla V, Guruprasad KP, Kabekkodu SP*, Satyamoorthy K*. Metastatic suppression by DOC2B is mediated by inhibition of epithelial-mesenchymal transition and induction of senescence. *Cell Biol Toxicol*. 2021 Mar 24. doi: 10.1007/s10565-021-09598-w. Impact Factor: 6.6.
12. Meneur C, Eswaran S, Adiga D, S S, G NK, Mallya S, Chakrabarty S, Kabekkodu SP*. Analysis of Nuclear Encoded Mitochondrial Gene Networks in Cervical Cancer. *Asian Pac J Cancer Prev*. 2021 Jun 1;22(6):1799-1811. Impact Factor: 1.58.
13. Sindhoora KM, Spandana KU, Ivanov D, Borisova E, Raghavendra U, Rai S, Kabekkodu SP, Mahato KK and Mazumder N*. Machine-learning-based classification of Stokes-Mueller polarization images for tissue characterization. *J. Phys.: Conf. Ser*. 2021 Apr 09;1859 012045.
14. Ghosh S, Pattanshetty SM, Mallya SD, Pandey D, Guddattu V, Kamath VG, Kabekkodu SP, Satyamoorthy K, Shetty RS*. Cervical cytology and associated factors among tribal women of Karnataka, India. *PLoS One*. 2021 Mar 19;16(3):e0248963. Impact Factor: 2.74.
15. Khan NG, Correia J, Adiga D, Rai PS, Dsouza HS, Chakrabarty S, Kabekkodu SP*. A comprehensive review on the carcinogenic potential of bisphenol A: clues and evidence. *Environ Sci Pollut Res Int*. 2021 Apr;28(16):19643-19663. Impact Factor:4.22.
16. Ghosh S, Mallya SD, Shetty RS*, Pattanshetty SM, Pandey D, Kabekkodu SP, Satyamoorthy K, Kamath VG. Knowledge, Attitude and Practices Towards Cervical Cancer and its Screening Among Women from Tribal Population: a Community-Based Study from Southern India. *J Racial Ethn Health Disparities*. 2021 Feb;8(1):88-93. Impact Factor: 2.14.
17. Kiran KR, Swathy PS, Paul B, Kabekkodu SP, Radhakrishna Rao M, Joshi MB, Rai PS, Satyamoorthy K, Muthusamy A*. Untargeted metabolomics and DNA barcoding for discrimination of *Phyllanthus* species. *J Ethnopharmacol*. 2021 Jun 12;273:113928. Impact Factor:4.36.
18. Chaudhari S, Dey Pereira S, Asare-Warehene M, Naha R, Kabekkodu SP, Tsang BK, Satyamoorthy K*. Comorbidities and inflammation associated with ovarian cancer and its influence on SARS-CoV-2 infection. *J Ovarian Res*. 2021 Feb 25;14(1):39. Impact Factor:4.23.
19. S S, Shukla V, Khan GN, Eswaran S, Adiga D, Kabekkodu SP*. Integrated bioinformatic analysis of miR-15a/16-1 cluster network in cervical cancer. *Reprod Biol*. 2021 Mar;21(1):100482. Impact Factor: 2.37.
20. Padam KSR, Chakrabarty S, Kabekkodu SP, Paul B, Hunter KD, Radhakrishnan R*. In silico analysis of HOX-associated transcription factors as potential regulators of oral cancer. *Oral Surg Oral Med Oral Pathol Oral Radiol*. 2021 Jul;132(1):72-79. Impact Factor: 1.6.

21. Dsouza VL, Adiga D, Sriharikrishnaa S, Suresh PS, Chatterjee A, Kabekkodu SP*. Small nucleolar RNA and its potential role in breast cancer - A comprehensive review. *Biochim Biophys Acta Rev Cancer*. 2021 Jan;1875(1):188501. Impact Factor: 10.6.
22. Chakrabarty S, Govindaraj P, Sankaran BP, Nagappa M, Kabekkodu SP, Jayaram P, Mallya S, Deepha S, Ponmalar JNJ, Arivinda HR, Meena AK, Jha RK, Sinha S, Gayathri N, Taly AB, Thangaraj K, Satyamoorthy K*. Contribution of nuclear and mitochondrial gene mutations in mitochondrial encephalopathy, lactic acidosis, and stroke-like episodes (MELAS) syndrome. *J Neurol*. 2021 Jun;268(6):2192-2207. Impact Factor:4.84.
23. Prabhu BN, Kanchamreddy SH, Sharma AR, Bhat SK, Bhat PV, Kabekkodu SP, Satyamoorthy K, Rai PS*. Conceptualization of functional single nucleotide polymorphisms of polycystic ovarian syndrome genes: an in silico approach. *J Endocrinol Invest*. 2021 Aug;44(8):1783-1793. Impact Factor:4.25.
24. Adiga D, Eswaran S, Pandey D, Sharan K, Kabekkodu SP*. Molecular landscape of recurrent cervical cancer. *Crit Rev Oncol Hematol*. 2021 Jan;157:103178. Impact Factor:6.31.
25. Adiga D, Radhakrishnan R, Chakrabarty S, Kumar P, Kabekkodu SP*. The Role of Calcium Signaling in Regulation of Epithelial-Mesenchymal Transition. *Cells Tissues Organs*. 2020 Dec 14:1-23. Impact Factor: 2.06.
26. Kiran KR, Deepika VB, Swathy PS, Prasad K, Kabekkodu SP, Murali TS, Satyamoorthy K, Muthusamy A*. ROS-dependent DNA damage and repair during germination of NaCl primed seeds. *J Photochem Photobiol B*. 2020 Dec;213:112050. Impact Factor: 6.25
27. Mani MS, Puranik A, Kabekkodu SP, Joshi MB, Dsouza HS*. Influence of VDR and HFE polymorphisms on blood lead levels of occupationally exposed workers. *Hum Exp Toxicol*. 2020 Nov 25:960327120975451. Impact Factor:2.9.
28. Mani MS, Joshi MB, Shetty RR, DSouza VL, Swathi M, Kabekkodu SP, Dsouza HS*. Lead exposure induces metabolic reprogramming in rat models. *Toxicol Lett*. 2020 Dec 15;335:11-27.
29. Kandettu A, Radhakrishnan R, Chakrabarty S, Sriharikrishnaa S, Kabekkodu SP*. The emerging role of miRNA clusters in breast cancer progression. *Biochim Biophys Acta Rev Cancer*. 2020 Dec;1874(2):188413, Impact Factor: 10.6.
30. Shetty SS, Sharma M, Fonseca FP, Jayaram P, Tanwar AS, Kabekkodu SP, Kapaettu S, Radhakrishnan R*. Signaling pathways promoting epithelial mesenchymal transition in oral submucous fibrosis and oral squamous cell carcinoma. *Jpn Dent Sci Rev*. 2020 Nov 1;56(1):97-108.
31. Alabi MA, Muthusamy A, Kabekkodu SP, Adebawo OO, Satyamoorthy K*. Anticancer properties of recipes derived from nigeria and african medicinal plants on breast cancer cells in vitro. *Scientific African*. 2020 Jul 1;8
32. Poojary M, Jishnu PV, Kabekkodu SP*. Prognostic Value of Melanoma-Associated Antigen-A (MAGE-A) Gene Expression in Various Human Cancers: A Systematic Review and Meta-analysis of 7428 Patients and 44 Studies. *Mol Diagn Ther*. 2020 Oct;24(5):537-555. Impact Factor:4.07.
33. Manandhar S, Kabekkodu SP, Pai KSR*. Aberrant canonical Wnt signaling: Phytochemical based modulation. *Phytomedicine*. 2020 May 23;76:153243. Impact Factor:5.34.
34. Kabekkodu SP, Shukla V, Varghese VK, Adiga D, Vethil Jishnu P, Chakrabarty S, Satyamoorthy K*. Cluster miRNAs and cancer: Diagnostic, prognostic and therapeutic opportunities. *Wiley Interdiscip Rev RNA*. 2020 Mar;11(2):e1563. Impact Factor:9.95.
35. Adiga D, Eswaran S, Sriharikrishnaa S, Nadeem KG, Kabekkodu SP*. Role of epigenetic changes in reproductive inflammation and male infertility. *Chem. Biol. Lett*. 2020, 7 (2):140-155.
36. Jishnu PV, Jayaram P, Shukla V, Varghese VK, Pandey D, Sharan K, Chakrabarty S, Satyamoorthy K, Kabekkodu SP*. Prognostic role of 14q32.31 miRNA cluster in various carcinomas: a systematic review and meta-analysis. *Clin Exp Metastasis*. 2020 Feb;37(1):31-46. Impact Factor:5.15.
37. Sridhar S, Rajesh C, Jishnu PV, Jayaram P, Kabekkodu SP*. Increased expression of P-cadherin is an indicator of poor prognosis in breast cancer: a systematic review and meta-analysis. *Breast Cancer Res Treat*. 2020 Jan;179(2):301-313. Impact Factor:4.87.
38. Shukla V, Adiga D, Jishnu PV, Varghese VK, Satyamoorthy K, Kabekkodu SP*. Role of miRNA clusters in epithelial to mesenchymal transition in cancer. *Front Biosci (Elite Ed)*. 2020 Impact Factor:2.25.