

P. Ravi Selvaganapathy

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McMaster University
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EDUCATION

B.Tech: Chemical and Electrochemical Engineering
Central Electrochemical Research Institute, Karaikudi, India (1998)

M.S: Electrical Engineering
University of Michigan, Ann Arbor, U.S.A. (2001)

PhD: Electrical Engineering
University of Michigan, Ann Arbor, U.S.A. (2002)
Advisor: Dr. Carlos Mastrangelo

ACADEMIC EXPERIENCE

Distinguished Engineering Professor	Mechanical and Biomedical Engineering	McMaster University	2021 onwards
Professor (Status Only)	Faculty of Dentistry	University of Toronto	2021-2022
Founding Director	Center of Excellence in Protective Materials and Equipment	McMaster University	2020 onwards
Co - Director	School of Biomedical Engineering	McMaster University	2020 onwards
Professor	Mechanical Engineering	McMaster University	2016 onwards
Canada Research Chair	Biomicrofluidics	McMaster University	2011-2021
Visiting Professor	Physics	Indian Inst. of Science	2012
Associate Professor	Mechanical Engineering	McMaster University	2010-2016
Assistant Professor	Mechanical Engineering	McMaster University	2005-2010
Post Doctoral Researcher	Nano/Bio Sciences	Sandia National Laboratory	2003-2004

HONOURS & AWARDS

- Distinguished Engineering Professor (2021)
- Dean's Honor Roll (Platinum) in Graduate Supervision (2020)
- Honorary Visiting Faculty, School of Environmental Engineering, Nankai University, China (2019)

- Editor's Pick Award, Biomicrofluidics, (2018)
- Dean's Honor Roll for Graduate Supervision (2018)
- Canada Research Chair Award (Tier II), Canada Research Chairs Program, (2016)
- Best Paper Award - Basic Science and Technology- Journal of Endodontics (2016)
- NSERC Discovery Accelerator Supplement Award (2015)
- Best Paper Award - Chemical Sensors - IEEE Sensors Conference (2014)
- McMaster Synergy Award for Interdisciplinary Collaboration (2014)
- Dean's Honor Roll for Teaching (2014)
- Rising Star in Global Health Award, Grand Challenges Canada, (2012)
- Canada Research Chair Award (Tier II), Canada Research Chairs Program, (2011)
- Early Researchers Award, Ontario Ministry of Research and Innovation, (2010)

RESEARCH AREAS OF INTEREST

- Micro/ Nano fluidics
- Micro/ Nano fabrication and additive manufacturing
- Micro electro mechanical systems (MEMS)
- Microdevices for drug delivery, drug discovery, diagnostics and artificial organs

SCHOLARLY AND PROFESSIONAL ACTIVITIES

Editorships

- **Associate Editor** – Biosensors (2019-)
- **Editorial Advisory Board** – Biomicrofluidics (2019-2021)
- **Associate Editor** – Micromachines (2019-)
- **Associate Editor** – Frontiers in Nanotechnology (2019-)
- **Guest Editor** – Sensors – Special Issue on Microfluidic Platforms for Environmental Monitoring and Medical Diagnostics (2019)
- **Guest Editor** – Micromachines – Special Issue on Microfluidics: Tissue Chips and Microphysiological Systems (2019)
- **Guest Editor** - Micromachines - Special Issue on Biomedical microdevices (2017)

Grant & Standards Committees

- Member – **IEEE** Working group on Three-Dimensional (3D) Bioprinting of Tissue-Engineered Medical Products (P2864) (2020 -2021)
- Member – **ASTM** Working group on Standard Terminology for Tissue Engineered Medical Products (F2312) (2020-2021)
- Member – Awards Committee – Biomicrofluidics Journal Section Chair - Electrical Engineering Discovery Grant Evaluation Group - **NSERC** (2017-19)
- Panel Member - Scalable Nanomanufacturing for Integrated Systems- **NSF**, USA (2017)
- Panel Member - Electrical Engineering Discovery Grant Evaluation Group - **NSERC** (2016-19)
- Panel Member - Emerging Frontiers in Research and Innovation - **NSF**, USA (2009)

Executive Positions

- Technical Program Committee Member - **IEEE Transducers Conference** (2021)

- Track Chair and Technical Program Committee Member - *IEEE Sensors Conference* (2020)
- Selection Committee Member for Best Paper Award – *Biomicrofluidics* Journal (2020)
- Program Organizing Committee & Track Chair – Packaging – *IEEE Sensors Conference* (2019)
- Track Chair (Biomicrofluidics) and Organizing Committee Member - 5th *European Conference on Microfluidics*, Strasbourg, France (2018);
- Session Chair and Organizer – Microfluidics, 32nd *International Symposium on Microscale Separations and Bioanalysis*, Niagara on the lake (2016)
- Program Organizing Committee & Track Chair – Chemical Sensors – *IEEE Sensors Conference* (2013)
- Session Chair – *International Smart Structures and Systems Conference* (2012)
- Session Organizer – Sensors and Actuators – *CANCAM* 2011,
- Session Chair and Organizer – Microfluidics - 92nd *Canadian Chemistry Conference*, Hamilton (2009).

PUBLICATIONS

Contributions to Books

1. S. Damodara, S. Shariari, W.I. Wu, P. Rezai, H.H. Hsu, P. Selvaganapathy, Materials and methods for the microfabrication of microfluidic biomedical devices, in *Microfluidic devices for biomedical applications* (Eds. X.J. Li, Y. Zhou), Elsevier, Chapter (2021)
2. A. Shahid, S. Liaghat, P. Ravi Selvaganapathy, Microfluidic devices for DNA amplification, *Bioelectronics and Medical Devices*, (Eds. K. Pal, H.B. Kraatz) Elsevier, Chapter 35, 721-755, (2019)
3. A. Aryasomayajula, P. Bayat, P. Rezai, P.R. Selvaganapathy, Microfluidic devices and their applications, in *Handbook of Nanotechnology* (Ed. B. Bhushan), Springer, (4th Edition) Chapter 16, 487-522, (2017)
4. W.I. Wu, P. Rezai, H.H. Hsu, P. Selvaganapathy, Materials and methods for the microfabrication of microfluidic biomedical devices, in *Microfluidic devices for biomedical applications* (Eds. X.J. Li, Y. Zhou), Woodhead Publishing, Chapter 1, 3-62, (2013)
5. P. Rezai, W. Wu, P. Selvaganapathy, Polymer Microfabrication, in *MEMS for biomedical applications*, (Ed: S. Bhansali), Woodhead Publishing, Chapter 1, 3-46, (2012).
6. P. Rezai, S. Salam, P. Selvaganapathy, B.P. Gupta, Microfluidic systems to study the biology of human diseases and identify potential therapeutic targets in *C. elegans*, in *Integrated Microsystems* (Ed: Kris Iniewski), CRC Press, Chapter. 27, 581-608 (2011).
7. A. Noori, S.K. Upadhyaya, P. Selvaganapathy, Materials and microfabrication processes for microfluidic devices, in *Microfluidics for Biological Applications*, E. Finehout, W.C. Tian (Eds.) Springer, Chapter 2, 35-92, (2009).
8. P. Selvaganapathy, Polymers in MEMS and microfluidics, in *Comprehensive Microsystems*, Y. Gianchandani, O. Tabata, H. Zappe (eds.) Elsevier, vol. 1, Chapter 8.05, 1-30, (2007).
9. P. Selvaganapathy, E.T. Carlen, C.H. Mastrangelo, Integrated microfabricated systems for genetic and protein analysis, in *Encyclopedia of Sensors*, C.A. Grimes, E.C. Dickey, M.V. Pishko (eds.), American Scientific Publishers, vol. X, 1-26, (2006).

Journal Publications

1. S. Sayed, P.R. Selvaganapathy, High resolution fabrication of nano patterns by multi-step iterative miniaturization of hot embossed pre-stressed polymer films and constrained shrinking, *Microsystems and Nanoengineering*, (2021) (accepted)
2. Q. Zhou, E. Doman, K. Schirrmann, Q. Chen, E. Seed, E.D. Johnstone, P.R. Selvaganapathy, A. Juel, M.O. Bernabeu, T. Kruger, I.L. Chernyavsky, Micro-haemodynamics at the maternal–fetal interface: experimental, theoretical and clinical perspectives, *Current Opinion in Biomedical Engineering*, (2021) (accepted)
3. M. Dabaghi, N. Tiessen, Q. Cao, A. Chandiramohan, N. Saraei, Y. Kim, T. Gupta, P.R. Selvaganapathy, J.A. Hirota, Adhesive-based fabrication technique for culture of lung airway epithelial cells with applications in cell patterning and microfluidics, *ACS Biomater. Sci. Eng.* (2021) (accepted)
4. D. Saha, V. Patel, P.R. Selvaganapathy, P. Kruse, Facile fabrication of conductive MoS₂ thin films by sonication in hot water and evaluation of their electrocatalytic performance in the hydrogen evolution reaction, *Nanoscale Advances*, (2021) (accepted)
5. S. Angizi, E. Yu, J. Dalmieda, D. Saha, P.R. Selvaganapathy, P. Kruse, Defect engineering of graphene to modulate the pH response of graphene devices, *Langmuir*, (2021) (accepted)
6. S. Damodara, Y. Zhu, P.R. Selvaganapathy, Patterned threads as solid-state reagent storage and delivery medium for automated periodic colorimetric monitoring of the environment, *Microfluidics Nanofluidics*, (2021) (accepted)
7. V. Patel, P. R. Selvaganapathy, Enhancing the sensitivity of cobalt based solid-state phosphate sensor using electrical pretreatment, *Sens. & Act. B: Chem.*, (2021) (accepted)
8. D. Kumbhare, S. Hassan, D. Diep, F.C.K. Duarte, J. Hung, S. Damodara, D.W.D West, P. R. Selvaganapathy, Potential role of blood biomarkers in fibromyalgia patients, *Pain*, (2021) (accepted)
9. S. Sayed, P.R. Selvaganapathy, Constrained shrinking of nanoimprinted pre-stressed polymer films to achieve programmable, high-resolution, miniaturized nanopatterns, *Nanotechnology*, 32, 505301, (2021)
10. J. Dalmieda, A.L. Zubiarraín, D. Saha, P.R. Selvaganapathy, P. Kruse, Impact of surface adsorption on metal-ligand binding of phenanthrolines, *J. Phys. Chem.*, (2021) (accepted)
11. R. Wu, M. Tauhiduzzaman, P.R. Selvaganapathy, Anisotropic wetting surfaces machined by diamond tool with tips microstructured by focused ion beam, *Materials & Design*, 210, 110014, (2021)
12. M. Sliwiak, R. Bui, M.A. Brook, P.R. Selvaganapathy, 3D printing of highly reactive silicones using inkjet type droplet ejection and free space droplet merging and reaction, *Additive Manufacturing*, 46, 102099, (2021)
13. C. Fusch, N. Rochow, P.R. Selvaganapathy, Reply to the “Comment on ‘A Pumpless Microfluidic Neonatal Lung Assist Device for Support of Preterm Neonates in Respiratory Distress’”, *Advanced Science*, 8, 2100831, (2021).
14. M. Dabaghi, S. Shahriari, N. Saraei, K. Da, A. Chandiramohan, P.R. Selvaganapathy, J. Hirota, Surface Modification of PDMS-based Microfluidic devices with collagen using polydopamine as a spacer to enhance primary human bronchial epithelial cells adhesion, *Micromachines*, 12, 132, (2021)

15. S.K.B. Taylor, M.H. Minhas, J. Tong, P.R. Selvaganapathy, R.K. Mishra, B.P. Gupta, Mitochondrial and ER stress signaling modulate electrotaxis behaviour in *C. elegans*, *Scientific Reports*, 11, 3115, (2021)
16. A. Shamsabadi, P.R. Selvaganapathy, Engineering murine adipocytes and skeletal muscle cells in meat-like constructs using self-assembled layer-by-layer biofabrication: A platform for development of cultivated meat, *Cells Tissues Organs*, (2021) (accepted) (invited for special issue)
17. V. Patel, P. Kruse, P.R. Selvaganapathy, Solid state sensors for hydrogen peroxide detection, *Biosensors*, 11, 9, (2021)
18. S. Damodara, D.J. Dwivedi, P.C. Liaw, A.E. Fox-Robichaud, P. Ravi Selvaganapathy, Single step separation and concentration of biomarker proteins using agarose based miniaturized isoelectric gates for point of care diagnostics, *Sens. & Act. B: Chem.*, 330, 129265, (2021)
19. J. Dalmieda, A. Zubiarrain-Laserna, D. Ganepola, P.R. Selvaganapathy, P. Kruse, Chemiresistive detection of silver ions in aqueous media, *Sens. & Act. B: Chem.*, 328, 129023, (2021)
20. S. Sayed, P.R. Selvaganapathy, Multi-step proportional miniaturization to nanoscale dimensions using pre-stressed polymer films, *Nanoscale Advances*, 2, 5461 - 5467 (2020)
21. D. Saha, P.R. Selvaganapathy, P. Kruse, Peroxide-Induced Tuning of the Conductivity of Nanometer-Thick MoS₂ Films for Solid State Sensors, *ACS Applied Nano Materials*, 3, 10864-10877, (2020)
22. A. Shamsabadi, P.R. Selvaganapathy, π -SACS: pH induced self-assembled cell sheets without the need for modified surfaces, *ACS Biomaterials Science and Engineering*, 6, 5346-5356, (2020)
23. M. Dabaghi, N. Rochow, N. Saraei, G. Fusch, S. Monkman, K. Da, A. Shamsabadi, J.L. Brash, D. Predescu, K. Delaney, C. Fusch, P. R. Selvaganapathy, A pumpless microfluidic neonatal lung assist device for support of preterm neonates in respiratory distress, *Advanced Science*, 7, 2001860 (2020)
24. A. Shamsabadi, P.R. Selvaganapathy, Tissue in a Tube: 3D In vitro tissue constructs with integrated multimodal environmental stimulation, *Materials Today Bio*, 7, 100070, (2020)
25. A. Ahmed, Y.-S. Guan, I. Hassan, C. Ling, Z. Li, I. Mosa, G. Phadke, P. R. Selvaganapathy, S. Chang, S. Ren, Multifunctional smart electronic skin fabricated from two-dimensional like polymer film, *Nano Energy*, 75, 105044, (2020)
26. J. Elango, P. R. Selvaganapathy, G. Lazzari, B. Bao, W. Wenhui, Biomimetic collagen-sodium alginate-titanium oxide (TiO₂) 3D matrix supports differentiated periodontal ligament fibroblasts growth for periodontal tissue regeneration, *International Journal of Biological Macromolecules*, 163, 9-18, (2020)
27. M. Dabaghi, N. Rochow, N. Saraei, R.K. Mahendran, G. Fusch, A.K. Chan, J.L. Brash, C. Fusch, P. R. Selvaganapathy, Miniaturization of artificial lungs towards portability, *Advanced Materials Technologies*, 5, 2000136, (2020) (highlighted by an invited article in *Advanced Science News*)
28. D.A. Ionescu, D.J. Harris, P.R. Selvaganapathy, A. Kishen, Electrokinetic transport and distribution of antibacterial nanoparticles for endodontic disinfection, *Int. Endodontic Journal*, 53, 1120-1130 (2020)

29. M.K. Wong, E.W. Li, M. Adam, P.R. Selvaganapathy, S. Raha, Establishment of an in vitro placental barrier model cultured under physiologically relevant oxygen levels, *Molecular Human Reproduction*, 26, 353-365, (2020)
30. A. Shamsabadi, P.R. Selvaganapathy, A 3D self assembled in vitro model to simulate direct and indirect interactions between adipocytes and skeletal muscle cells, *Advanced Biosystems*, 4, e2000034, (2020)
31. N. Xiao, R. Wu, J.J Huang, P.R. Selvaganapathy, Anode surface modification regulates biofilm community population and the performance of micro-MFC based biochemical oxygen demand sensor, *Chem. Engg. Sci.*, 221, 115691, (2020)
32. R. Ghaemi, J. Tong, B. Gupta, P. R. Selvaganapathy, Microfluidic device for microinjection of *Caenorhabditis elegans*, *Micromachines*, 11, 295, (2020) (invited) (10th Anniversary special issue)
33. A. Mohammadzadeh, A. Fox-Robichaud, P. R. Selvaganapathy, Electroplating of multiple materials in parallel using patterned gels with applications in electrochemical sensing, *Sensors*, 20, 886, (2020) (invited)
34. N. Xiao, P.R. Selvaganapathy, R. Wu, J.J Huang, Influence of wastewater microbial community on the performance of miniaturized microbial fuel cell biosensor, *Bioresource Technology*, 302, 122777, (2020)
35. M. Dabaghi, N. Saraei, G. Fusch, N. Rochow, J.L. Brash, C. Fusch, P. R. Selvaganapathy, Microfluidic blood oxygenators with integrated hollow chambers for enhanced air exchange from all four sides, *J. Membrane Sci.*, 596, 117741, (2020)
36. N. Xiao, R. Wu, J.J. Huang, P.R. Selvaganapathy, Development of a xurographically fabricated miniaturized low-cost, high-performance microbial fuel cell and its application for sensing biological oxygen demand, *Sensors & Actuators B: Chem.*, 304, 127432, (2020)
37. B. Lee, A. Shamsabadi, P.R. Selvaganapathy, K. Grandfield, A bioprinted in vitro model for osteoblast to osteocyte transformation by changing mechanical properties of the ECM, *Advanced Biosystems*, 3, 1900126, (2019) (featured on the cover)
38. E. Mahoney, H.H. Hsu, F. Du, B. Xiong, P.R. Selvaganapathy, Q. Fang, Optofluidic dissolved Oxygen sensing with sensitivity enhancement through multiple reflections, *IEEE Sensors*, 19, 10452-10460, (2019)
39. M. Dabaghi, N. Saraei, G. Fusch, N. Rochow, J. Brash, C. Fusch, P. R. Selvaganapathy, An ultra-thin, all PDMS-based microfluidic lung assist device with high oxygenation capacity, *Biomicrofluidics*, 13, 034116 (2019)
40. A. Shahin-Shamsabadi, P. Ravi Selvaganapathy, A rapid fabrication technique for self-assembled collagen-based multicellular heterogeneous 3D tissue constructs, *Acta Biomaterialia*, 92, 172-183, (2019)
41. D. Cevik, M. Acker, R. Ghaemi, P. Arefi, J. Zhang, P.R. Selvaganapathy, I. Dworkin, R. Jacobs, Chloroform and Desflurane immobilization with recovery of viable *Drosophila* larvae for confocal imaging, *J. Insect Physiology*, 117, 103900, (2019)
42. D. Firouzi, C.Y. Ching, P.R. Selvaganapathy, Development of oxygen-plasma-surface-treated UHMWPE fabric coated with a mixture of SiC/polyurethane for protection against puncture and needle threats, *Fibers*, 7, 46, (2019) (invited)

43. A. Mohammadzadeh, A. Fox-Robichaud, P.R. Selvaganapathy, Rapid and inexpensive method for fabrication and integration of electrodes in microfluidic devices, *J. MEMS*, 28, 597-605, (2019)
44. A. Ahmed, I. Hassan, M. El-Kady, A. Radhi, C.K. Jeong, P.R. Selvaganapathy, S. Ren, Q. Wang, R.B. Kaner, Integrated Triboelectric Nanogenerators in the Era of Internet of Things: A review, *Advanced Science*, (2019) (accepted)
45. C. Guo, P. Koshy, F. Coelho, P.R. Selvaganapathy, Sink electrical discharge machining of hydrophobic surfaces, *CIRP annals – Manufacturing Technology*, 68, 185-188, (2019)
46. A. Ahmed, I. Hassan, I.M. Mosa, E. Elsanadidy, G.S. Phadke, M.F. El-Kady, J.F. Rusling, P.R. Selvaganapathy, R.B. Kaner, All printable snow-based triboelectric nanogenerator, *Nano Energy*, 60, 17-25, (2019)
47. A. Ahmed, M.F. El-Kady, I. Hassan, A. Negm, A.M. Pourrahimi, M. Muni, P.R. Selvaganapathy, R.B. Kaner, Fire-Retardant, Self-Extinguishing Triboelectric Nanogenerators, *Nano Energy*, 59, 336-345, (2019)
48. M. Osborne, A. Aryasomayajula, A. Shakeri, P.R. Selvaganapathy, T. Didar, Suppression of Biofouling on a Permeable Membrane for Dissolved Oxygen Sensing using a Lubricant-Infused Coating, *ACS Sensors*, 4, 687-693, (2019)
49. A. Shahin-Shamsabadi, P. Ravi Selvaganapathy, ExCeL: Combining Extrusion Printing on Cellulose Scaffolds with Lamination to Create In Vitro Biological Models, *Biofabrication*, 11, 035002, (2019)
50. R. Attalla, E. Puersten, N. Jain, P.R. Selvaganapathy, 3D Bioprinting of Heterogeneous Bi- and Tri-layered Hollow Channels within Gel Scaffolds using Scalable Multi-Axial Microfluidic Extrusion Nozzle, *Biofabrication*, 11, 015012, (2019)
51. A. Mohammadzadeh, A. Fox-Robichaud, P.R. Selvaganapathy, Rapid and inexpensive method for fabrication of multi-material multi-layer microfluidic devices, *J. Micromech. Microeng.*, 29, 015013, (2019)
52. M. Dabaghi, N. Saraei, G. Fusch, N. Rochow, J.L. Brash, C. Fusch, P.R. Selvaganapathy, An ultra-thin highly flexible microfluidic device for blood oxygenation, *Lab on a Chip*, 18, 3780 - 3789 (2018) (featured on the cover)
53. S. Zheng, M. Zlatin, P. Ravi Selvaganapathy, M.A. Brook, Multiple modulus silicone elastomers using 3D extrusion printing of low viscosity inks, *Additive Manufacturing*, (2018) (accepted)
54. P. Madadkar, P.R. Selvaganapathy, R. Ghosh, Continuous flow microreactor for protein PEGylation, *Biomicrofluidics*, 12, 044114 (2018)
55. C. Richman, S. Rashid, S. Prashar, R.K. Mishra, P.R. Selvaganapathy, B.P. Gupta, C. elegans MANF homolog is necessary for the protection of dopaminergic neurons and ER Unfolded Protein Response, *Frontiers in Neuroscience*, 12, 544, (2018)
56. D. Firouzi, M.K. Russel, S.N. Rizvi, C.Y. Ching, P.R. Selvaganapathy, Development of flexible particle-laden elastomeric textiles with improved penetration resistance to hypodermic needles, *Materials and Design*, 156, 419-428, (2018)
57. M. Wong, M.A. Green, S. Shawky, A. Aryasomyajula, T. Ewart, P. R Selvaganapathy, S. Raha, Extracellular matrix (ECM) surface regulates self-assembly of three-dimensional placental trophoblast spheroids, *PLOS ONE*, 13, e0199632,(2018)

58. M. Dabaghi, G. Fusch, N. Saraei, N. Rochow, J. Brash, C. Fusch, P. R. Selvaganapathy, An artificial placenta type microfluidic blood oxygenator with double-sided gas transfer microchannels and its integration as a neonatal lung assist device, *Biomicrofluidics*, 12, 044101,(2018) **(Featured as the Editor's Pick)**
59. U. Umatheva, P. Madadkar, P.R. Selvaganapathy, R. Ghosh, Computational fluid dynamics (CFD) simulation of laterally-fed membrane chromatography, *Chemical Engineering Research and Design*, 137, 412-420, (2018)
60. R. Ghaemi, M. Dabaghi, R. Attalla, A. Shahid, H.H. Hsu, P. R. Selvaganapathy, Use of flame activation of surfaces to bond PDMS to variety of substrates for fabrication of multimaterial microchannels, *J. Micromech. Microeng.* 28,087001,(2018)
61. J. Peng, N. Rochow, J. Jansen, D. Predescu, B. DeFrance, S.-Y. Lee, G. Fusch, P. Ravi Selvaganapathy, C. Fusch, Postnatal dilatation of umbilical cord vessels and its impact on wall integrity: Prerequisite for the artificial placenta, *Artificial Organs*, 41, 393-399, (2018)
62. H. Matharoo, M. Dabaghi, N. Rochow, G. Fusch, N. Saraei, M. Tauhiduzzaman, S. Veldhuis, J. Brash, C. Fusch, and P.R. Selvaganapathy, Steel reinforced composite silicone membranes and its integration to microfluidic oxygenators for high performance gas exchange, *Biomicrofluidics*, 12, 014107, (2018).
63. X. Deng, R. Attalla, L. Sadowski, M. Chen, M. Majcher, I. Urosev, D-C.Yin, P.R. Selvaganapathy, C. Filipe, T. Hoare, Autonomously self-adhesive hydrogels as building blocks for additive manufacturing, *Biomacromolecules*, 19, 62-70, (2018) **(featured on the cover) (Top 5 most downloaded research article, December 2017)**
64. R. Attalla, C.S. Ling, P.R. Selvaganapathy, Silicon carbide nanoparticles as an effective bioadhesive to bond collagen containing composite gel layers for tissue engineering applications, *Advanced Healthcare Materials*, 7, 1701385 (2018) **(featured on the cover)**
65. H.H. Hsu, M.J. Deen, P.R. Selvaganapathy, Complete solid state dissolved oxygen sensor using hemin electrocatalyst and palladium-reusable reference electrode, *IEEE Sensors*, 18, 941-947, (2018).
66. N. Kazemi-Zanjani,, M. Shayegannia, R. Prinja, A.O. Montazeri, A. Mohammadzadeh, K. Dixon, J. Zhu, P.R. Selvaganapathy, A. Zavodni, N. Matsuura, N.P. Kherani, Multiwavelengthsurface-enhanced ramanspectroscopy using rainbow trapping in width-graded plasmonicgratings, *Advanced Optical Materials*, 6, 1701136,(2018)
67. S. Banik, J. Mahony, P.R. Selvaganapathy, Elution of Artificial Sputum from Swab by Rotating Magnetic Field-Induced Mechanical Impingement, *Applied Sciences*, 7, 1255, (2017) (invited)
68. A. Shahid, S. Chong, J. Mahony, M.J. Deen, P.R. Selvaganapathy, Electrical tweezer for droplet transportation, extraction, merging and DNA analysis, *Micromachines*, 8, 353, (2017) **(invited)**
69. R. Ghaemi, P. Arefi, A. Stosic, M. Acker, Q. Raza, J.R. Jacobs, P.R. Selvaganapathy, A microfluidic microinjector for toxicological and developmental studies in *Drosophila* embryos, *Lab on a Chip*, 17, 3898-3908, (2017)
70. E. Hoque, H.H. Hsu, A. Aryasomayajula, P.R. Selvaganapathy, P. Kruse, Pencil-drawn chemiresistive sensor for free chlorine in water, *IEEE Sensor Lett.*, 1, 4500504, (2017)
71. A. Mohtasebi, A. Broomfield, T. Chowdhury, P.R. Selvaganapathy, P. Kruse, Reagent-free quantification of aqueous free chlorine via electrical read-out of colorimetrically functionalized pencil lines, *ACS Appl. Mat. Int.*,9, 20748-20761, (2017)

72. J. Liu, J. Mahony, P. Ravi Selvaganapathy, Low-cost and versatile integration of microwire electrodes and optical waveguides into silicone elastomeric devices using modified xurographic methods, *npj-Microsystems and Nanoengineering*, 3, 17040, (2017)
73. R. Ghaemi, P. Rezai, F.R. Nejad, P.R. Selvaganapathy, Characterization of microfluidic clamps for immobilizing and imaging of *Drosophila Melanogaster* larva's central nervous system, *Biomicrofluidics*, 11, 034113, (2017)
74. M.K. Russel, P.R. Selvaganapathy, C.Y. Ching, Electrical discharge characteristics of a dielectric liquid under external flow in a microchannel with planar electrode configuration, *J. Electrostatics*, 87, 212-216, (2017)
75. M. S. Islam, A. Aryasomayajula, P. Ravi Selvaganapathy, A review on macroscale and microscale cell lysis methods, *Micromachines*, 8, 83, (2017) **(invited)**
76. M.S. Islam, K. Kuryllo, A. Shahid, Y. Li, M.J. Deen, Ravi Selvaganapathy, Electrophoretic concentration and electrical lysis of bacteria in a microfluidic device using a nanoporous membrane, *Micromachines*, 8,45, (2017) **(invited)**
77. H.H. Hsu, A. Aryasomayajula, P.R. Selvaganapathy, A review of sensing systems and their need for environmental water monitoring, *Critical Reviews in Biomedical Engineering*, 44, 357-382, (2016).
78. S. Ayyash, W.I. Wu, P. R. Selvaganapathy, Fast and inexpensive detection of bacterial viability and drug effectiveness through metabolic monitoring, *Sensors*,16, 1879, (2016) **(invited - special issue on Biomicrofluidics)**
79. M. K. Russel, S.M. Hasnain, P. R. Selvaganapathy, C. Y. Ching, Effect of doping Ferrocene in the working fluid of electrohydrodynamic (EHD) micropumps, *Microfluidics and Nanofluidics*, 20, 112 (2016)
80. R. Ghaemi, P.R. Selvaganapathy, Microfluidic Devices for Automation of Assays on *Drosophila Melanogaster* for Applications in Drug Discovery and Biological Studies, *Current Pharmaceutical Biotechnology*, 17, 822-836, (2016) **(invited)**
81. M. K. Russel, P. R. Selvaganapathy, C. Y. Ching, Ion Drag Electrohydrodynamic (EHD) Micro-Pumps under a Pulsed Voltage, *Journal of Electrostatics*, 82, 48-54, (2016)
82. Y. Qin, H.-J. Kwon, A. Subrahmanyam, M.M.R. Howlader, P. Ravi Selvaganapathy, A. Adronov, M. Jamal Deen, Inkjet-printed bifunctional carbon nanotubes for pH sensing, *Material letters*, 176, 68-70, (2016)
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131. S. Upadhyaya, P. Selvaganapathy, Miniaturized microfluidic formats for cell based high throughput screening, *Critical Reviews in Biomedical Engineering*, 37, 1-193, (2009)
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141. P. Selvaganapathy, E.T. Carlen, C.H. Mastrangelo, Electrothermally actuated inline microfluidic valve, *Sensors and Actuators, A: Physical*, 104, 275-282, (2003).
142. P. Selvaganapathy, Y.S. Leung Ki, P. Renaud, C.H. Mastrangelo, Bubble-free electrokinetic pumping, *Journal of Microelectromechanical Systems*, 11, 448 -453, (2002).
143. N. Kamalanand, G. Gopalakrishnan, S.G. Ponnambalam, J. Mathiyarasu, R.N. Natarajan, P. Subramaniam, N. Palaniswamy, N.S. Rengaswamy, Role of hydrogen and hydroxyl ion in cathodic disbondment, *Anti-Corrosion Methods and Materials*, 45, 243–247, (1998).

PATENTS

1. **US Patent** 10,514,351, P.R. Selvaganapathy, P. Kruse, E. Hoque, H.H. Hsu, Sensors and methods for detecting an oxidant (2019)
2. **US Patent** 9,841,381: P.R. Selvaganapathy, W.I. Wu, Temperature change indicator and methods of making the same (2017)

3. **Canadian Patent** 2,619,000: M.J. Deen, P.R. Selvaganapathy, M.W. Shinwari, BioFET based microfluidic systems (2017)
4. **US Patent:** 9,492,603: C. Fusch, L. Berry, A. Chan, N. Rochow, P. Selvaganapathy, J. Brash, G. Fusch, Artificial Placenta (2016).
5. **US Patent:** 8,702,939: P. Selvaganapathy, Bhagwati Gupta, Pouya Rezai, Electrotaxis methods and devices (2014).
6. **US patent:** 8,173,415: P. Selvaganapathy, A. Noori, Single cell microinjection using compliant fluidic channels (2012)
7. **US Patent** 7,125,478: P. Selvaganapathy, M.A. Burns, D.T. Burke, C.H. Mastrangelo; Microscale electrophoresis devices for biomolecule separation and detection, (2006).
8. **US Patent** 7,142,303: Y.B. Gianchandani, C.G. Wilson, L. Que, B. Mitra, P. Selvaganapathy; Microdischarge optical source apparatus and method and system for analyzing a sample, (2006).
9. **US Patent** 7,116,115: Y.B. Gianchandani, L.L. Chu, K. Takahata, P. Selvaganapathy, J.L. Shohet; Micromachined probe apparatus and methods for making and using same to characterize liquid in a fluidic channel and map embedded charge in a sample on a substrate, (2006).

PRESENTATIONS AT MEETINGS

Invited

1. P.R.Selvaganapathy, Chemiresistive peroxide sensor fabricated using xurography and its applications in biosensing, Canadian Chemical Engineering Conference, Montreal, Oct 2021 **(invited)**
2. P.R. Selvaganapathy, Microfluidic devices for handling small organisms, Canadian Association of Physicists Annual Conference, Jun 2021 **(invited)**
3. P.R. Selvaganapathy, Cultivating whole muscle cuts without scaffolds, Good Food Institute Seminar, Jan 2021 **(keynote)**
4. P.R. Selvaganapathy, Biofabrication techniques for tissue engineering and cultivated meat, International virtual conference on Biomedical materials innovation, Dec 2020 **(keynote)**
5. P.R. Selvaganapathy, Center of excellence in protective equipment and materials, WFI 2020 Virtual Conference, Dec 2020 **(invited)**
6. P.R. Selvaganapathy, Microfluidic technologies for additive manufacturing in tissue engineering, 103rd Canadian Chemistry Conference, Winnipeg, May 2020 **(invited)**
7. P.R. Selvaganapathy, Solid state sensors for environmental monitoring, International Forum on Green Development and Engineering Innovation, Nankai University, Nov 2019 **(invited)**
8. P.R. Selvaganapathy, Smart Sensor technologies for Aging in Place, Disruptive Technology & Digital Cities Summit, Stanford University, Jun 2019 **(invited)**
9. P.R. Selvaganapathy, A. Shahid, S. Chong, J. Mahony, M.J. Deen, Electrical Methods for simple sample preparation, Canadian Chemistry Conference, May 2018 **(invited)**
10. P.R. Selvaganapathy, Rana Attalla, Michael Zlatin, Monika Sliwiak, Microfluidic nozzles for additive manufacturing of gels and soft materials, 5th International Conference on Fluid Flow and Heat and Mass Transfer, June 2018 **(keynote)**

11. P.R. Selvaganapathy, Rana Attalla, Erin Puersten, Nidhi Jain, Simple low cost methods to build perfusable 3D structures composed of gels and cells, Ontario on a Chip Conference, May 2018 **(keynote)**
12. P.R. Selvaganapathy, A. Mohammadzadeh, A. Fox-Robichaud, A fast and inexpensive method for fabrication and integration of electrodes in microfluidic devices, 5th European Conference on Microfluidics, Strasbourg, France, March 2018 **(invited)**
13. P. Selvaganapathy, Additive manufacturing methods for integration of electrodes in flexible devices, Canada-China Symposium on flexible electronics, London, Canada, (Sep 2017) **(invited)**
14. P.R. Selvaganapathy, Electrifying Microfluidics, International Symposium on Electrohydrodynamics, Ottawa, Canada (June 2017) **(keynote)**
15. P.R. Selvaganapathy, Biomedical microdevices for diagnostics, drug discovery and artificial organs, Firestone Institute, St. Joseph's Hospital, Hamilton, Canada, (June 2017) **(invited)**
16. P.R. Selvaganapathy, Microfabricated sensors for environmental monitoring, Nankai University, Tianjin, China, (Nov 2016) **(invited)**
17. P.R. Selvaganapathy, Fast bacterial culture using microfluidics, Jiangsu Industrial Technology Research Institute, (Sep 2016) **(invited)**
18. P.R. Selvaganapathy, Printed gel platforms with integrated microfluidic channels for perfusion and cell culture, Canadian Chemistry Conference, Halifax, Canada, (Jun 2016) **(invited)**
19. P.R. Selvaganapathy, Simple sample preparation for bioassays, 229th Electrochemical Society Conference, San Diego, USA, (May 2016) **(invited)**
20. P.R. Selvaganapathy, A frequency domain optofluidics dissolved oxygen sensor with enhanced sensitivity for water monitoring, 229th Electrochemical Society Conference, San Diego, USA, (May 2016) **(invited)**
21. P.R. Selvaganapathy, 3D printing of microfluidic vascular channels in gels using commercial 3D printers, SPIE Photonics West, BIOS, San Francisco, USA, (Feb 2016) **(invited)**
22. P.R. Selvaganapathy, Sensors exploiting the nanoscale phenomena for environmental and medical monitoring, Indo-Canadian Symposium on Nanotechnology, Mysore, India, (Feb 2016) **(invited)**
23. P.R. Selvaganapathy, Microfluidic sample preparation for handling raw biological samples – examples of urine and plasma, Canadian Chemistry Conference, Vancouver, (Jun 2014) **(invited)**
24. P.R. Selvaganapathy, Simple microfluidic sample preparation for point of care diagnostics, Ontario on a Chip Conference, Toronto, (May 2014) **(invited)**
25. P.R. Selvaganapathy, Advanced functional materials for biomicrofluidics, Thermec Conference, Las Vegas, USA, (Dec 2013) **(invited)**
26. C.Fusch, P. R. Selvaganapathy, Development Of Microfluidic Oxygenators As Lung Assisting Devices For Term And Preterm Newborn Infants, 9th Int. Conf. on Pediatric Mechanical Circulatory Support Systems & Pediatric Cardiopulmonary Perfusion, Hershey, PA, USA, (May 2013) **(invited)**
27. P.R. Selvaganapathy, Microfluidics and its application in drug discovery, drug delivery and diagnostics, Department of Chemistry and Chemical Engineering, Soochow University, Suzhou, China, (Nov 2012) **(invited)**

28. P.R. Selvaganapathy, Integration of functional materials into microfluidic devices, Canadian Materials Science Conference, London, Canada, (Jun 2012)
29. P.R. Selvaganapathy, Electrical control of fluid flow and transport at the microscale, Center for Nanoscience and Engineering , Indian Institute of Science, Bangalore, India (Mar 2012) **(invited)**
30. P.R. Selvaganapathy, Microfluidics and how does it relate to wood and its products?, Institute of Wood Science and Technology , Bangalore, India (Feb 2012)
31. P.R. Selvaganapathy, What is MEMS and microfluidics, National Institute of Engineering , Mysore, India (Feb 2012) **(invited)**
32. P.R. Selvaganapathy, Electrifying microfluidics – A few examples of using electric fields and forces to control microfluidic components and a few applications, Materials Research Center , Indian Institute of Science, Bangalore, India (Feb 2012)
33. P.R. Selvaganapathy, Smart materials and surfaces in microfluidics – a few examples, Sixth International Conference , Bangalore, India (Jan 2012) **(invited)**
34. P.R. Selvaganapathy, Electrifying Microfluidics, Brockhouse Institute of Materials Research, McMaster University, (Nov 2011)
35. P.R. Selvaganapathy, Electrical methods for transport of particles, cells, organisms and generation of droplets in microfluidic systems, 2011 CMOS Emerging Technologies Workshop, Whistler, British Columbia, (June 2011)
36. M.J. Deen, M.M.R. Howlader, P.R. Selvaganapathy, T. Suga, Nanobonding technologies for emerging applications, in *Proc. of International Conference on Electronic Packaging*, Kyoto, Japan, (2011) **(invited)**
37. S. Safari, P.R. Selvaganapathy, M.J. Deen, Microfluidic reference electrode and its application in BioFET, Pacificchem 2010, Honolulu, Hawaii, (Dec 2010)
38. B.G. Gupta, P. Rezai, P.R. Selvaganapathy, Microfluidic systems for chemical screening and drug discovery, 2010 CMOS Emerging Technologies Workshop, Whistler, British Columbia, (May 2010)
39. P. Selvaganapathy, Microfluidics for optoelectronic applications, 217th Electrochemical Society Meeting, Vancouver, (April 2010).

Contributed

1. V. Patel, P. Kruse and P. R. Selvaganapathy, Hydrogen peroxide chemiresistive detection platform with wide range of detection, in IEEE Sensors Conference, Montreal, QC, Canada, (Oct 2019)
2. A. Mohammadzadeh, A.E. Fox-Robichaud, P. R. Selvaganapathy, Parallel Multimaterial Electroplating Using Patterned Gels and Integration into Microfluidic Devices, IEEE Sensors Conference, Montreal, Canada, (Oct 2019)
3. A. Shamsabadi, P. R. Selvaganapathy, ExCeL: Combining Extrusion Bioprinting on Cellulose Scaffolds with Lamination for Perfusable Tissue Constructs, TERMIS EU Conference, Rhodes, Greece, (May 2019)
4. E. Hoque, L. H-H. Hsu, A. Aryasomayajula, P. R. Selvaganapathy, and P. Kruse, Pencil-Drawn Chemiresistive Sensor for Free Chlorine in Water, *IEEE Sensors Conference*, Glasgow UK, (Oct – Nov 2017)

5. R. Attalla, C. Ling, P.R. Selvaganapathy, Lamination-Based Assembly of Hydrogels with Integrated Channels Using Nanoparticle Adhesives, in *39th Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, (July 2017)
6. H.H. Hsu, P. R. Selvaganapathy, Development of all solid state sensors for environmental water monitoring: dissolved oxygen and free chlorine, in *ECS Conference*, San Diego, USA, (May 2016)
7. H.H. Hsu, E. Hoque, P. R. Selvaganapathy, P. Kruse, A carbon nanotube based resettable sensors for measuring free chlorine in drinking water, *In IEEE Sensors Conference*, Spain, (Nov 2014).
8. H.H. Hsu, P.R. Selvaganapathy, Stable and reusable electrochemical sensor for continuous monitoring of phosphate in water, *In IEEE Sensors Conference*, Spain, (Nov 2014)
9. P. Madadkar, P.R. Selvaganapathy, R. Ghosh, Protein PEGylation using microreactors, *In 2014 AIChE Annual Meeting*, , Atlanta, USA, (Nov. 2014)
10. S.B. Campbell, J. Yang, W.I. Wu, P.R. Selvaganapathy, T.R. Hoare, Design of a Microinjection Device for Injection of in Situ Gelling Hydrogels for Ophthalmic Drug Delivery, *AIChE Annual Meeting*, San Francisco, USA, (Nov 2013)
11. A.S. Jawed, W. Syed, W.I. Wu, S.B. Campbell, T.R. Hoare, P.R. Selvaganapathy, Wirelessly Controlled Microfluidic Actuators Using Radiofrequency Electromagnetic Induction, *AIChE Annual Meeting*, San Francisco, USA, (Nov 2013)
12. H.H. Hsu, P. Selvaganapathy, Development of a low cost haemin based dissolved oxygen sensor with anti-biofouling coating for water monitoring, *In IEEE Sensors conference*, Baltimore, USA, (Oct 2013). (**Best student paper award in chemical sensors**)
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