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Assistant Professor of Biology

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Education

2006 - 2011	Ph.D Biology	University of Dayton, Dayton, Ohio
2003 - 2006	M.Sc. Applied Genetics	Bangalore University, Bangalore, India.
2000 - 2003	B.Sc Genetics	The Oxford College of Science, Bangalore, India.

Professional Positions

December 2015 - April 2018	Postdoctoral Associate: University of Florida, Gainesville, Florida. USA.
January 2016 - Present	Voluntary Scientific Advisor and technical consultant: The Well Bioscience Inc., Newark, New Jersey. USA.
January 2017 - Present	Voluntary Scientific Advisor (Regenerative medicine): Supro Direct, Indianapolis, Indiana. USA.
March 2017 - Present	Voluntary Scientific Advisor: The Biotex Group, Hyderabad, India.
February 2012 - March 2015	Postdoctoral Research Fellow: Kansas State University, Manhattan, Kansas. USA.
August 2006 - December 2011	Teaching Assistant: Bio Lab Investigations I, II and 403 labs (Human Physiology) at the University of Dayton, Ohio. USA.
January 2005 - April 2006	Research Trainee: National Centre for Biological Sciences (NCBS), Bangalore, India.

Publications

Journal Articles

1. **Pavan Rajanahalli***. Genomic instability and consequences. Molecular Biology: Open Access, 2017 (*Editorial, submitted).
2. **Pavan Rajanahalli***. DNA repair in ESCs and iPSCs. Molecular Biology: Open Access, 2016, 5 (4). (*Editorial).
3. **Pavan Rajanahalli**, Christopher J. Stucke, and Yiling Hong. The Effects of Silver

Nanoparticles on Mouse Embryonic Stem Cell Self-renewal and Proliferation. *Toxicology Reports*, 2015, 2: 758- 764.

4. **Pavan Rajanahalli**, Hongzhou Huang, Xiuzhi Sun, and Mark Weiss. 3D Culture of rat embryonic stem cells and rat induced pluripotent stem cells in a novel PGmatrix hydrogel (LB20) *FASEB J* April 2014 28:LB20.
5. **Pavan Rajanahalli** and Mark L Weiss. Derivation and characterization of rat iPSCs using a mouse STEMCCA reprogramming vector. *FASEB J* April 2013 27:lb53.
6. Bui, P., **Rajanahalli, P.**, Hong, J., Weiss, M. L. Proof of pluripotency of rat iPSCs missing. *Cell proliferation*, 2013, 46 (2): 119-20.
7. James Hong, Hong He, Phuoc Bui, Ben Ryba-White, Mohammad A.K. Rumi, Michael J. Soares, Debasree Dutta, Soumen Paul, Masaki Kawamata, Takahiro Ochiya, Qi-Long Ying, **Pavan Rajanahalli**, and Mark L. Weiss. A focused microarray for screening rat embryonic stem cell lines. *Stem Cells and Development*, 2013, 22 (3): 431-43.
8. **Rajanahalli, P.**, King, D. A., Meyer, K., Zhu, L., Wagner, B. D., Robinson, M. L and Hong, Y. Conversion of mouse fibroblasts to sphere cells with differentiation potential induced by AlbuMAXI-containing medium. *Frontiers in Bioscience (Elite Edition)*, 2012, 4: 1813-1822.
9. Kyle Meyer, **Pavan Rajanahalli***, Maqusood Ahamed, John J. Rowe, Yiling Hong. ZnO nanoparticles induce apoptosis in human dermal fibroblasts via p53 and p38 pathways *Toxicology in Vitro*. 2011, 25 (8): 1721-1726 (*Co-author).
10. Pavan Rajanahalli, Hongzhou Huang. 3D culture of human iPSCs using a polysaccharide based hydrogel system. *PLOS One* (In preparation).
11. **Rajanahalli, P.**, and Hong, Y. Silver nanoparticles inhibit differentiation and alter mitochondrial stability in stem cells. *Toxicology Reports* (In preparation).
12. **Rajanahalli, P.**, and Hong, Y. Silver nanoparticle toxicity in stem cells. *Toxicology Reports* (In preparation).
13. **Rajanahalli, P.**, Santostephano, K., Armitage, L., Taylor, J., Fredette, N. et.al. Development of an isogenic system using hiPSCs to investigate type 1 diabetes. *Stem Cell Reports* (In preparation).
14. **Rajanahalli, P.**, Sui, L., Annamalai, M., Newby, B., Fernandez, G. B. et al. Effects of interferon modulation and mitochondrial respiration in T1D-iPSC derived pancreatic neo β -cells. *Stem Cell Reports* (In preparation).

Abstracts

1. **Pavan Rajanahalli**. 3D cell culture system for growing hiPSCs using VitroGel 3D. American Society for Cell Biology, 2017. Philadelphia, PA.
2. **Pavan Rajanahalli**, Hongzhou (John) Huang. VitroGel system for 3D cell culture of human iPSCs. The 5th Annual Next Gen Stem Cell Conference, 2017. Hartford, CT.
3. **Pavan Rajanahalli**, Hongzhou (John) Huang. VitroGel 3D system for 3D cell culture of multiple cell lines. American Association for Cancer Research (AACR), 2017. Washington D. C.
4. **Pavan Rajanahalli**, Lina Sui, Gabe B. Fernandez, Mani Annamalai, Brittney N. Newby, Scott E. Stimpson, Savannah C. Summy, Jing Chen, Dieter Egli, Clayton E. Matthews. iPSC derived pancreatic β -cells and Primary Islets Respond Similarly to Autoimmune Effector Mechanisms. Human Islet Research Network (HIRN) 2017 Annual Meeting,

- Washington D.C., and 3rd Annual CTSI iPSC Retreat (2017), Gainesville, FL.
5. Botelho Moniz, Filipa, **Rajanahalli, Pavan***, Yeh, Wen-I, Perry, Daniel J, Mallone, Roberto, Nakayama, Maki, Mathews, Clayton E, and Brusko, Todd M. Genetic Manipulation of Type 1 Diabetes Candidate Risk Genes in Antigen-specific T Cells derived from Human iPSCs. Human Islet Research Network (HIRN) 2017 Annual Meeting, Washington D.C., and 3rd Annual CTSI iPSC Retreat (2017), Gainesville, FL. (*Co-Author).
 6. **Pavan Rajanahalli**, Hongzhou (John) Huang. VitroGel system for 3D cell culture of multiple cell lines. American Society for Cell Biology (ASCB) 2016, San Francisco.
 7. Katherine Santostefano, **Pavan Rajanahalli**, Lucas Armitage, Melanie Cash, Mark Wallet, Naohiro Terada, and Clayton Mathews. Genetic Modifications of the PTPN22 gene in iPSCs using CRISPR/Cas9. Human Islet Research Network (HIRN) 2016 Annual Meeting, Washington D.C.
 8. **Rajanahalli, P.**, Huang, H., Sun, X., and Weiss, M. L. (2014). 3D Culture of rat embryonic stem cells and rat induced pluripotent stem cells in a novel PGmatrix hydrogel. International Society for Stem Cell Research (ISSCR). Vancouver, BC, Canada.
 9. J. Robert Smith., **Rajanahalli, P.**, and Weiss, M. L. (2014). Human Umbilical Cord Mesenchymal Stem Cell Isolation Method for Increased Cell Yield and GMP Compliance. Kansas State University. Manhattan, Kansas.
 10. **Rajanahalli, P.**, He, H., Smith, J. R., Binas, B., Verfaillie, C., and Weiss, M. L. (2014). Comparative PCR array analysis of rat pluripotent and adult stem cells. International Society for Stem Cell Research (ISSCR). Vancouver, BC, Canada.
 11. Smith, J. R., He, H., **Rajanahalli, P.**, Ostertag, E., Vivian, J. L., and Weiss, M. L. (2014). Gene Targeting in Rat ESCs using Gene Editing Technology. International Society for Stem Cell Research (ISSCR). Vancouver, BC, Canada.
 12. **Rajanahalli, P.**, and Weiss, M. L. (2013). Derivation and characterization of rat iPS cells using a mouse STEMCCA reprogramming vector. International Society for Stem Cell Research (ISSCR). Boston, Massachusetts.
 13. **Rajanahalli, P.**, and Weiss, M. L. (2013). Derivation and characterization of rat iPS cells using a mouse STEMCCA reprogramming vector. Experimental Biology. Boston, Massachusetts.
 14. **Rajanahalli, P.** and Hong, Y. (2011). Stander symposium poster presentation. Effects of silver nanoparticles on mouse embryonic stem cell pluripotency and differentiation potential. Dayton, Ohio.
 15. **Rajanahalli, P.** and Hong, Y. (2010). Stander symposium poster presentation. Reprogramming mouse embryonic fibroblasts into neuronal like cells using a chemically defined medium. Dayton, Ohio.
 16. **Rajanahalli, P.** and Hong, Y. (2009). Stander symposium poster presentation. Histone modifications during early reprogramming of mouse embryonic fibroblasts to mouse induced pluripotent stem cells. Dayton, Ohio.
 17. **Rajanahalli, P.** and Hong, Y. (2008). Stander symposium poster presentation. Study of DNA methylation in genes associated with stem cell pluripotency, survival and renewal in mouse embryonic stem cells and mouse induced pluripotent stem cells. Dayton, Ohio.

18. **Rajanahalli, P.** and Hong, Y. (2007). Midwest Regional TriBeta Conference. Expression of Oct-4 in response to DNA damage in mouse embryonic stem cells and neuroblastoma cells. University of Dayton, Ohio.
 19. **Rajanahalli, P.** and Hong, Y. (2007). Stander symposium poster presentation. Expression of Oct-4 in the determination of stem cell fate in mouse embryonic stem cells. Dayton, Ohio.
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Research Support/Grants obtained

1. The Well Bioscience Inc. Jan 2016 - December 2018. **PI: Pavan Rajanahalli.** Goal is to grow multiple cell lineages including iPSCs, adult stem cells and cancer cell lines) in a 3D environment using a hydrogel system. **\$10,000.**
 2. NSF STTR Novel Peptide Hydrogel for 3D Cell Culture. 7/1/13-6/30/15 PI: Dr. Xiuzhi Sun. 2013-14. Goal was to test a novel peptide based hydrogel for expansion and differentiation of rat and human pluripotent stem cells in 3D.
 3. Kansas University Medical Centre Spinal Cord Injury Program (Deffenbaugh Foundation): 7/1/2011-4/30/2015. PI: Dr. Peter Smith. Goal was to generate transplantable rat and human neural stem cells into spinal cord injury models and eventually transition the process into the clinic.
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Specialized Skills

Cell culture - Stem cell culture, iPSC generation and differentiation into 3 germ layers (human, mouse and rat ESCs and iPSCs), mesenchymal stem cells (human umbilical cord stem cells, canine adipose tissue stem cells, rat bone marrow stem cells) and various cancer cell lines (N2a neuroblastoma cells, A375, A549), neural stem cells (mouse, human, rat and marmoset), 3D spheroid and organoid cultures.

Cell and Molecular Biology - PCR, Q-PCR, plasmid DNA isolation, RNA isolation, western blotting, co-immunoprecipitation, immunocytochemistry, microarray analysis, ChIP, bisulfite modification, gene expression analysis using Qluore and DAVID, transfection (neon and lipofectamine), apoptosis assays (AO/PI, Annexin V) lentiviral generation and transduction, Flow cytometry, FACS, vector construction, seahorse assay (mitochondrial metabolism), gene editing using CRISPR/Cas9 technology.

Microscopy - Extensive experience in confocal and fluorescence microscopy.

Animal Handling - Rat embryo dissection, microinjection (blastocyst injection), chimera formation, rat umbilical cord and embryonic fibroblast isolation and bone marrow isolation.

Awards

- American Society for Cell Biology, 2017. The Well Bioscience, LLC travel award.
- Annual Biomedical Research Conference for Minority Students (ABRCMS) Judges' Travel Award, 2015 and 2016.
- Phi Zeta Research Day – Basic Sciences Research Presentation Award, 2014.
- University of Dayton Teaching Fellowship, 2006 - 2011
- Graduate Student Summer Research Fellowship Award for 2007, 2009, 2010 and 2011

from the University of Dayton, Ohio.

Professional Service/Outreach

- **Research Judge** – 1st Annual Diversity Graduate Research Symposium. University of Florida, Gainesville, FL. March, 2017.
- **Research Judge** for Undergraduate minority students. Annual Biomedical Research Conference for Minority Students (ABRCMS), Tampa, Florida. November, 2016.
- **Research Judge** for Undergraduate and Graduate students for reviewing travel grants and abstracts online – Society for Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS). June, 2016.
- **Research Judge** for Undergraduate, Post baccalaureate and Graduate students for reviewing submitted abstracts online – Annual Biomedical Research Conference for Minority Students (ABRCMS). September, 2014, 2015, 2016.
- **Research Judge** for M.Ds, Residents, Fellows and ECFMG certified candidates. American Medical Association (AMA) Research Symposium. Dallas, Texas. November, 2014.
- **Research Judge** for Graduates - 2014 Research and the State poster session. Kansas State University. October, 2014.
- **Research Judge** for Graduate, Postdoctoral and Research Associates – University of Louisville. Research Louisville 2014. September, 2014.
- **Undergraduate Research Judge** – Ohio State University. 8th Annual Undergraduate Research Week Student Poster Forum. September, 2014.
- **Undergraduate and Graduate Research Judge** - Kansas State University Research Forum Graduate Student Biological Sciences oral session. April, 2014.
- **Undergraduate Research Judge** - Kansas State University Research Forum Undergraduate Student Biological Sciences poster session. April, 2014.

Editorial Board Member

- Molecular Biology: Open Access
- Scholars Journal of Research in Agriculture and Biology
- ESR Junior Editorial Team member
- Global Journal of Stem Cell Biology and Transplantation
- Journal of Advances in Biology
- Open Journal of Cell and Protein Science

Journal Reviewer

- Biological Systems: Open Access
- Cancer Management and Research
- Cell and Developmental Biology
- Clinical and Medical Biochemistry

- Current Stem Cell Research and Therapy
- Diabetes, Metabolic Syndrome and Obesity: Targets and Therapy
- Edorium Journals of Biomedical Science
- Environmental Toxicology
- Gastro – Open Journal
- Gene Technology
- International Journal of Nanomedicine
- International Journal of Pharma Research & Review
- Journal of Advanced Techniques in Biology and Medicine
- Journal of Biotechnology and Biomaterials
- Journal of Environmental Science and Health, Part A
- Journal of Molecular Biology: Open Access
- Journal of Nanotoxicology and Nanomedicine (JNN)
- Journal of Stem Cells
- Journal of Stem Cells and Regenerative Medicine
- Journal of Tissue Sciences and Engineering
- Nanomedicine: Nanotechnology, Biology and Medicine
- Nanotechnology, Science and Applications
- Nature (Scientific Reports)
- OncoTargets and Therapy
- Pathology and Laboratory Medicine: Open Journal
- PLoS ONE
- Small
- Stem Cells and Cloning: Advances and Applications
- Toxicology In Vitro
- Toxicology Reports
- Urology and Andrology – Open Journal
- World Review of Science, Technology and Sustainable Development

INVITED SPEAKER

1. International Conference on Nanomaterials and Nanotechnology. NANO - 2015. Tamil Nadu. India (Honored with golden plaque).
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COURSES, SEMINARS AND CONFERENCES ATTENDED

1. Human Islet Research Network (2017, 2016). Baltimore, Maryland, USA.
2. American Society for Cell Biology (2016). San Francisco, USA.
3. International Workshop on Comprehensive Toxicology (2015). Bangalore. India.
4. International Society for Stem Cell Research (2014). Vancouver, BC. Canada.
5. International Society for Stem Cell Research (2013). Boston, Massachusetts.
6. Second Midwest conference on stem cell biology and therapy (2012). Oakland University, Michigan.
7. Sixth Annual Translational Stem Cell Research Conference, NYSCF, 2011, NY, USA

8. Synthetic and viral based systems for gene silencing workshop (2010). Sigma Aldrich. St Louis, Missouri
 9. Multifunctional Nanomaterials (2009). Wright State University, Dayton. Ohio, USA
 10. International Society for Stem Cell Research (2008). Philadelphia, USA
 11. Midwest Regional TriBeta Conference (2007). University of Dayton, Ohio, USA.
 12. Stem cell Workshop, NCBS and Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore, India
 13. International symposium on genes, genetics and origin of humans, NCBS, Bangalore
 14. An advanced course on the genetics and genomics of drosophila, NCBS, Bangalore
 15. Symposium on development and genetics, JNCASR, Bangalore, India
 16. International symposium on molecules, machines and networks, NCBS, Bangalore
 17. SSRI International symposium, life and universe-cosmology, biology and consciousness, Central college, Bangalore
 18. DNA symposium, Bangalore
 19. International conference on parasitic diseases, Bangalore
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PRESENTATIONS

- Application of Stem Cells in Health and Disease. University of Tampa, Tampa, Florida. USA (2018).
- Effects of silver nanoparticles on stem cell differentiation and pluripotency. KSRCT, Tamil Nadu, India (2015).
- 3D culture of pluripotent stem cells. Kansas State University. (2014)
- Characterization of mouse iPSCs generated by chemical methods. University of Dayton. (2011)
- Direct reprogramming of human fibroblasts into an ectoderm positive lineage. University of Dayton. (2010)
- Can iPSCs be generated by using only small molecules? University of Dayton. (2009)
- Analysis of gene mutations in Parkinson's disease. University of Dayton. (2008)
- Site directed mutagenic studies to reveal sumoylation sites of Oct4. University of Dayton. (2007)
- UV and IR induced DNA damage response in mouse ES cells. University of Dayton. (2006)
- Nuclear reprogramming of embryonic stem cells, Centre for Applied Genetics (CAG), Department of Zoology, Bangalore University, Bangalore, India (2006).
- Immunogenetics of the c-Kit gene, CAG, Bangalore University, Bangalore (2006).
- Bottleneck phenomenon in *Apis mellifera*, CAG, Bangalore University, Bangalore (2006).
- Gene therapy of severe combined immuno deficiency syndrome (SCID) - causes and cure, CAG, Bangalore University, Bangalore (2005).
- Epigenetics of Anglemann's syndrome, CAG, Bangalore University, Bangalore (2005).
- Gap Junctions - A crucial role in cell signaling, Jawaharlal Nehru Planetarium, Bangalore (Invited Speaker) (2005).

- Mitochondrial Biogenesis - A fusion fission story, National Centre for Biological Sciences (NCBS), Bangalore (2005).
- Co-immunoprecipitation studies of deep orange (dor) and carnation (car) in *D. melanogaster* embryo, NCBS, Bangalore (2005).
- Effects of latrunculin and jasplakinolide on mitochondrial velocity in *Drosophila melanogaster* S2R+ cells, NCBS, Bangalore (2005).

ADDITIONAL QUALIFICATIONS

2005	Certificate course in General Astronomy	M.P. Birla Institute of Fundamental Research, Bangalore, India.
2005	Certificate course in Astrobiology	M.P. Birla Institute of Fundamental Research, Bangalore, India.
2004	National Eligibility Test (NET)	Joint Council of Scientific and Industrial Research (CSIR) and the University Grants Commission (UGC), India for research and University level teaching.
2002	Human karyotyping	St John's Medical College, Bangalore.
