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: Geeta Ravindran

eRA COMMONS USERNAME (credential, e.g., agency login): GEETA RAVINDRAN

POSITION TITLE: Clinical Assistant Professor, Affiliated, Department of Medical Education;

Senior Research Scientist, Cell Therapy Institute, Nova Southeastern University.

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
University of Mumbai, India	BSc	1985	Chemistry/ Biochemistry
University of Mumbai, India	MSc	1987	Biochemistry
University of Mumbai, India	PhD	1999	Life Sciences

A. Personal Statement

During my research career, I had the opportunity to gain vast hands-on experience over the past fifteen years in stem cell biology. This work was focused on the use of pluripotent and adult stem cell derived neurons for studies of neurological disorders, including Parkinson's disease, ALS, spinal cord injury. My research included expansion, characterization and generation of specific neuronal phenotypes including midbrain dopaminergic neurons, motor neurons, and oligodendrocytes, under xenofree conditions. Additionally, I have led safety and efficacy studies for proof-of-concept testing in preclinical models of degenerative diseases including evaluating the therapeutic angiogenesis of UCMSC in preclinical model of ischemic limb disease. These studies included biodistribution as well as scale-up and differentiation of stem cells in a cGMP setting. I was also actively involved in organizing workshops and international symposium, training programs for undergraduate, graduate and doctoral students, postgraduate teachers at colleges and universities on stem cells and their potential applications to Neurodegenerative diseases. I have a blend of industry and academic experience from my time spent at the National University of Singapore and at the Karolinska Institute, Stockholm Sweden. I am a new intendent investigator at NSU, recently appointed as faculty member in the College of Allopathic Medicine. I bring my expertise in stem cell biology to advance the goals of the current ongoing neurodegenerative projects including Parkinson's disease and ALS at NSU. I am involved in teaching in the MBS program at NSU-MD; Course Director for the topic Personalized Medicine. I am also imparting hands-on training to two undergraduate and one Master student on Pluripotent stem cells.

B. Positions and Honors

1992-2001 Scientific Officer, Biochemistry Dept., Research Society of BJWHC & Institute of Child Health Mumbai, India.

2001-2004 Research Scientist, Embryonic Stem cell group, Reliance Life Sciences Pvt. Ltd (RLS), Mumbai, India

2004-2008 Principal Scientist and Team leader, Neural Stem Cells Group, RLS, Mumbai, India
2009-2010 Visiting Scientist - Dept of Biological Sciences, NUS, Singapore
2008-2011 Group Leader, Stem Cell Research Dept, Regenerative Medicine Group, RLS, Mumbai, India
2011-2018 Senior Researcher, Karolinska Institute, Stockholm, Sweden,
2018- Senior Research Scientist, Cell Therapy Institute, Nova Southeastern University, Florida, USA
2020- Affiliate Assistant Professor, Department of Medical Education, Dr Kiran C Patel College of Allopathic Medicine, Nova Southeastern University, Florida, USA

Honors and other scientific activities

1985- 1986 Mumbai University Topper (Gold Medalist) in Biochemistry at the Bachelors level & Open Merit Scholarship at the Masters level.
2001 Best oral presentation at the 22nd Annual Conference of ACBI, Perundurai Medical college, TN; India.
2001 Lady Ratan Tata International travel grant, Mumbai, India
2001 Postdoctoral Japan Society for the Promotion of Science (JSPS) short term fellowship- ASSACT - 4 weeks workshop on culture, characterization and application of stem cells for hepatocytes and liver construction) at Nagoya and Kanaya, Japan.
2001 Postdoctoral ICRO- UNESCO fellowship- 4 weeks training course in "Basic aspects for industrial development of Biotechnology and Cell Biology" at the, Graduate School of Engineering, Nagoya University, Japan.
2008-2018 Editorial board member, World Journal of Transplantation (2011-2018); Open Stem Cell Journal (2008-2010), Reviewer, International Journal of Neuroscience, Brain Research; International Journal of Stem Cells.

C. Contributions to Science -Selected Publications/ Patents:

1) Generation and preclinical evaluation of stem cell derived neural progenitors in disease models:

My main research interest and focus for the last several years has been on developing methods for the characterization and neuronal differentiation of stem cells (including mouse embryonic stem cells, human pluripotent stem cells, adult stem cells) into specific lineages. The long-term efficacy and safety of these differentiated derivatives were evaluated in disease models and the results has been encouraging.

a) **Ravindran G,** Rao HS – Neural progenitors differentiated from human limbal stem cells survive long-term and reduce motor asymmetry in Parkinsonian rats. ***Manuscript under review***

b) Ribeiro D, Laguna Goya R, **Ravindran G**, Vuono R, Parish CL, Foldi C, Piroth T, Yang S, Parmar M, Nikkhah G, Hjerling-Leffler J, Lindvall O, Barker RA, Arenas E. - Efficient expansion and dopaminergic differentiation of human fetal ventral midbrain neural stem cells by midbrain morphogens. ***Neurobiol Dis***. (2013) 49:118-127.

c) Shetty P, **Ravindran G**, Sarang S, Thakur AM, Rao HS, Viswanathan C.- Clinical grade Mesenchymal stem cells transdifferentiated under xeno free conditions alleviates motor deficits in rat model of Parkinson's disease**.** ***Cell Biol Int***. (2009) 8: 830-8.

d) **Ravindran G,** Ramnath RL, Rao HS, Chandra V. One-year survival and significant reversal of motor deficits in parkinsonian rats transplanted with hESC derived dopaminergic neurons. ***Biochem Biophys Res Commun.*** (2008) 373(2):258-64.

e) **Ravindran G,** Rao HS. Enriched NCAM-positive cells form functional dopaminergic neurons in the rat model of Parkinson's disease. ***Stem Cells Dev.*** (2006) 15 (4):575-82.

2) **Establishment, characterization and differentiation of pluripotent stem cells**

I have been part of the Regenerative Medicine group of Reliance Life Sciences (RLS), a biotech/ company in India for ten years. Our main research focus at the biotech company was to develop a wide range of novel research- led autologous and allogenic cell therapies using both adult and embryonic stem cells.

a) Kandalam U, Kawai T, **Ravindran G**, Brockman R, Romero J, Munro M, Ortiz J, Heidari A, Thomas R, Kuriakose S, Naglieri C, Ejtemai S, Kaltman SI. Pre-differentiated Gingival Stem Cells Induced Bone Regeneration in Rat Alveolar Bone Defect Model. ***Tissue Eng Part A***. (2020) Sep 30. doi: 10.1089/ten.TEA.2020.0052. Online ahead of print.

b) Mandal, A., Srivastava, G., Viswanathan, C., **Ravindran, G**. - Stage specific differentiation of human embryonic stem cells into hepatocyte-like cells using conditioned medium from a human hepatoma cell line. ***Stem Cell Studies***, (2012) *2* (1), e2.

c) Shetty, P., Thakur, A. M., **Ravindran, G**., & Viswanathan, C. - Directed therapeutic angiogenesis by mesenchymal stem cells from umbilical cord matrix in preclinical model of ischemic limb disease. ***Stem Cell Studies*** (2011), *1*(1), e16.

d) Pal R*, **Ravindran G***. Assessment of pluripotency and multilineage differentiation potential of NTERA-2 cells as a model for studying human embryonic stem cells. ***Cell Prolif***. (2006), 39 (6):585-98 *Equal contribution

e) Mandal A, Tipnis S, Pal R, **Ravindran G**, Bose B, Patki A, Rao MS, Khanna A Characterization and in vitro differentiation potential of a new human embryonic stem cell line, ReliCellhES1. ***Differentiation.*** (2006) *74 (2-3):81-90.*

3) **Development and Validation of several proprietary methodologies to study the function of pluripotent stem cells**

I have been part of several major technological advances that have contributed to the development of methods to study different pluripotent stem cells populations, both induced and embryonic. This work also includes proprietary method to induce dopaminergic neuronal differentiation using both adult and embryonic stem cells. Our methods are robust, validated on different platforms, and shown to decrease the time necessary for the differentiation process.

a) **US 7674620; HK 1078109** - *Inventors* : Totey SM, **Ravindran G.** *Title* :Derivation of terminally differentiated dopaminergic neurons from human embryonic stem cells.

b) **US 7811817; EP1893748**- *Inventors* : Mandal A, Tipnis S, **Ravindran G**, Kulkarni J, PatkiA, Pal R, Bose B, Khan F, Khanna A. *Title*: Establishment of a human embryonic stem cell line using mammalian cells.

c) **US 8187875-** *Inventors:* **Ravindran G,** Rao H. *Title* :Dopaminergic neurons derived from corneal limbus, methods of isolation and uses thereof.

d) **US 8067233 ; HK 1095855.** *Inventors*: Totey SM, Kashyap S, Khan F, Pal R, Khanna A, Tipnis S, **Ravindran G.** *Title* **:** Pluripotent embryonic-like stem cells derived from corneal limbus, methods of isolation and uses thereof.

D Research Support

Title: **Chronic Fatigue Syndrome in a Petri-Dish**

Agency: Solve MC/CFS Foundation **Role**: Co-PI **Period**: Jan 2019 – Dec 2019

The project is focused on characterizing structural and functional changes in neurons that are generated by reprogramming of peripheral mononuclear cells using induced pluripotent stem cells (iPSC) technology.

Title: Modeling ALS with human iPSC derived motor neurons.

Agency: NSU Presidential Grant. **Role**: PI **Period**: Jul 2020 –Dec 2021

This study will focus on the disease mechanism leading to MN degeneration and lay the necessary foundation for developing a cell-based platform for ALS biomarker discovery.

Title: A novel strategy for vascularized bone regeneration.

Agency: Osteoscience Foundation. **Role**: Co-I **Period**: Jan 2021 – Dec 2022

In bone regenerative therapies vascularization is a major challenge. This study uses a novel approach to develop vascularized bone graft for the regeneration of craniofacial bone.