Dr. Xue-Jun Li

**Regenerative Medicine**

Research in our group focuses on specifying neuronal subtypes from human pluripotent stem cells and using these stem cells to model motor neuron diseases, including spinal muscular atrophy and hereditary spastic paraplegias. Human pluripotent stem cells have the capacity to become all cell types in the body, including neurons. They provide an invaluable tool for studying early human neural development and exploring the potential treatment of neurological diseases. By combining cellular, molecular, bioengineering and system approaches, our ultimate goal is to develop therapeutics for treatment of these debilitating diseases.

Dr. Mathew T. Mathew

**Disability Research**

Our group focuses on simulation of human artificial joints, biomechanics and tribocorrosion aspects of implant biomaterials in dentistry and orthopedics. Biomedical implants are increasingly used to assist patients with disabilities to bring comfort and help them continue their healthy physical activities with an expected level. By using the concept of synergism between wear and corrosion (tribocorrosion), we would like to understand the degradation mechanisms and to provide solutions to prevent the failure and/or early prediction of the failure processes. In addition, our research group is also interested in developing new diagnostic techniques and tools for the community with joint-related disability.
Dr. Yongchao Mou (Postdoctoral Researcher)
I work on generating patient-specific stem cell-derived neural models and decoding mechanisms underlying axonal defects in hereditary spastic paraplegia (HSP). I have modeled HSPs with cortical/spinal neuron co-cultures and determined lipid metabolism’s role in axonal defects of HSP.

Dr. Divya Bijukumar (Postdoctoral Researcher)
I have developed drug delivery systems for improved bioavailability of cancer therapy drugs along with targeted graphene nanoparticles for hyperthermia-mediated tumor ablation for liver tumor. I also perform toxicity evaluation of wear particles using tissue-specific primary cells.

Dhruvi Shah (MBT Student)
My project focuses on studying the mitochondrial dynamics underlying axonal defects in autosomal recessive HSP, SPG15 and SPG48. I found out that the axonal defects in SPG15 and SPG48 can be rescued by targeting mitochondrial fission-related molecule, Drp1.

Shraddha Rao (MBT Student)
My work focused on increasing the surface roughness of titanium samples to enhance osseointegration with the bone. Successive characterization and in-vitro studies proved to enhance osseointegration, thus reducing the complications associated with titanium implants in the bone.

The Best Basic Science Research Poster Award went to Shruti Salunkhe for her poster entitled “Effect of Differentially Modulated Macrophages on Cell Assisted Corrosion (CAC) of CoCrMo Alloy: Hip Implant Application.”

The Best MBT Student Research Poster Award went to Abhijith Segu for his poster entitled “Cellular and Molecular Mechanism of Neuronal Damage Induced by CoCrMo Degradation Products.”

Dr. Ramaswamy Kalyanasundaram presents the Research Innovation Award to Ghata Nandi.

The Best Research Award goes to Justin Hobson, a summer student in the SMaRT program.

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