**Research Positions for Cardiovascular Biology, Stem Cell Biology, Immunology, or Tissue Engineering at Yale University**

The Qyang laboratory is seeking postdoctoral scientists, Associate Research Scientists, or Research Scientists who are interested in developing novel therapeutics to treat cardiovascular diseases utilizing cellular, molecular, immunological, tissue engineering, and animal models. Available projects for research are as follows.

**1. Studies of Molecular and Biomechanical Factors Influencing Hypertrophic Cardiomyopathy and of Vascular Proliferative diseases:** Familial hypertrophic cardiomyopathy (HCM) is one of the most common heritable heart diseases in the world, afflicting an estimated 1 out of every 500 people. New scientists are expected to join the investigation of the molecular mechanisms of HCM, by studying the functional consequences of force generation and stretch-sensing mutations in HCM families, using patient induced pluripotent stem cell (iPSC)-derived cardiomyocytes, engineered heart tissues (Riaz et al., ***Circulation***2022, 145:1238-1253), single-cell RNA sequencing, high-throughput small molecule screening, and animal models. Additionally, new scientists will join the efforts in unraveling disease mechanisms and developing novel therapies for vascular proliferative diseases using vascular smooth muscle cells derived from iPSCs generated from patients with elastin defects in blood vessels and animal models with elastin deficiency (Ge et al., ***Circulation*** 2012, 126:1695-1704; Dash et al., ***Stem Cell Reports*** 2016, 7: 19-28; Ellis et al., ***JMCC*** 2022, 163:167-174; and Ellis et al., 2023, under revision).

**2. “Universal” Donor Tissue Engineered Vascular Grafts:** Our group has previously derived functional vascular smooth muscle cells and endothelial cells from human iPSCs for developing mechanically robust tissue engineered vascular grafts (TEVGs) (Gui et al., **Biomaterials** 2016, 102:120-129; Luo et al., ***Biomaterials*** 2017, 147:116-132; Luo et al., ***Cell Stem Cell*** 2020, 26:251-261; Luo et al., ***Circulation Research*** 2022, 130:925-927). We have also derived hypoimmunogenic “universal” human iPSCs by using CRISPR-Cas9 and TALEN-mediated gene editing techniques. New scientists are expected to join the investigation of “universal”, endothelialized human iPSC-TEVGs in both rodent and porcine models, thereby setting the stage for developing vascular grafts that are immunocompatible and readily available to any patient recipient.

**3. Tissue Engineered Pulsatile Conduits to Treat Single Ventricle Disorders:** Single ventricle congenital heart defects affect approximately 1 in 1,000 live births and poses a prominent medical issue. We have designed a strategy for producing a contractile Fontan conduit that incorporates engineered heart tissues (EHTs) made by seeding hiPSC-derived cardiomyocytes into decellularized porcine heart matrix that is crucial for force generation. Novel contractile Fontan conduits, currently named tissue engineered pulsatile conduits (TEPCs), have been developed by wrapping EHTs around decellularized human umbilical arteries to produce a functional tissue capable of supporting blood flow and creating driving pressures (Park et al., ***Acta Biomater***. 2020, 102:220-230; Park et al., 2023, under review). New scientists are expected to join efforts to combine biomimetic mechanical and electrical stimulations to induce maximal force production of the TEPCs in bioreactors, followed by *in vivo* implantation in animal models.

**Qualifications:** Expertise in molecular biology, cell biology, immunology, or tissue engineering is expected from the applicants.

Please send your CV, a brief description of your research experience and relevance to the Qyang laboratory, your reasoning in pursuing research training in the Qyang laboratory, and the names of three references to Dr. Qyang.

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