



Stem Cells @ UCR

Stem Cell Center Newsletter – Jan 2020, No. 3

New SRA staff member at the Stem Cell Core

We are pleased to announce that Dr. Aynun Begum has joined our staff as the Stem Cell Core's SRA.

Dr. Begum has many years of stem cell experience and is an excellent addition to the Stem Cell Core. Come stop by and say hello!



What's Inside

New Staff Member

New Instruments –
Seahorse and NEPA21

Recent Pubs and Grants

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Other Stem Cell Courses

New Instruments in the Stem Cell Core

Bulldog Bio NEPA21 Electroporator – Available Now!

- Buffer Compatibility - Only non-capacitor, square-wave electroporator. Non-capacitors allow the system to more reliably produce square wave pulses even at physiological levels of salt.
- Normal medium is used as the electroporation buffer. Less expensive to operate than the Amaxa which requires special buffers for each cell type.
- Better Performance - patented 4-phase pulsing program, for first "poring" and then "transfer" molecules by electro-kinetic energy to overcome limits of diffusion - much more gentle on cells.
- The NEPA21 has been referenced in more than 600 publications since 2015. It is often used in pioneering work, especially for challenging protocol development. Including: transfecting organoids and PSCs and delivering gene editing reagents into finicky iPSCs



Seahorse XFp Analyzer: Live-cell Metabolic Assay Platform – Available Now!

- Compatibility with both adherent and suspension cells as well as isolated mitochondria and non-mammalian samples.
- Ability to perform up to 4 independent injections per well with automatic mixing
- Automatic calculation of oxygen consumption rate (OCR) and extracellular acidification rate (ECAR).
- Simultaneous measurement of OCR and ECAR in the same well
- Ability to measure mitochondrial function & rate of glycolysis in live cells
- Analytical sensitivity for small sample sizes
- Label-free detection in real time

Recent Publications and Grants!

Learn about Stem Cell Research @ UCR

Publications

Christopher B. Horner, Maricela Maldonado, Youyi Tai, R. M. Imtiaz Karim Rony, and Jin Nam. **Spatially Regulated Multiphenotypic Differentiation of Stem Cells in 3D via Engineered Mechanical Gradient.** ACS Applied Materials & Interfaces 2019 11 (49), 45479-45488. DOI: 10.1021/acsami.9b17266.

Marquez J, Criscione J, Charney RM, Prasad MS, Hwang WY, Mis EK, García-Castro MI, Khokha MK. **Disrupted ER membrane protein complex-mediated topogenesis drives congenital neural crest defects.** J Clin Invest. 2020 Jan 6; doi: 10.1172/JCI129308.

Prasad MS, Uribe-Querol E, Marquez J, Vadasz S, Yardley N, Shelar PB, Charney RM, García-Castro MI. **Blastula stage specification of avian neural crest.** Dev Biol. 2019 Oct 11; doi: 10.1016/j.ydbio.2019.10.007.

Gomez GA, Prasad MS, Wong M, Charney RM, Shelar PB, Sandhu N, Hackland JOS, Hernandez JC, Leung AW, García-Castro MI. **WNT/ β -catenin modulates the axial identity of embryonic stem cell-derived human neural crest.** Development. 2019 Aug 29;146(16). doi: 10.1242/dev.175604.

Hackland JOS, Shelar PB, Sandhu N, Prasad MS, Charney RM, Gomez GA, Frith TJR, García-Castro MI. **FGF Modulates the Axial Identity of Trunk hPSC-Derived Neural Crest but Not the Cranial-Trunk Decision.** Stem Cell Reports. 2019 May 14;12(5):920-933. doi: 10.1016/j.stemcr.2019.04.015.

Gang Guo, Xiang Zhuang, Qing Xu, Zhenru Wu, Yongjie Zhu, Yongjie Zhou, Yuanmin Li, Yanrong Lu, Bo Zhang, Prue Talbot, Jiayu Liao, Junjun She, Hong Bu & Yujun Shi. **Peripheral infusion of human umbilical cord mesenchymal stem cells rescues acute liver failure lethality in monkeys.** Stem Cell Res Ther 10, 84 (2019). <https://doi.org/10.1186/s13287-019-1184-2>.

Zheng, Sika. **Alternative splicing programming of axon formation.** WIREs RNA. Jan 2020; e1585. <https://doi.org/10.1002/wrna.1585>

Grants

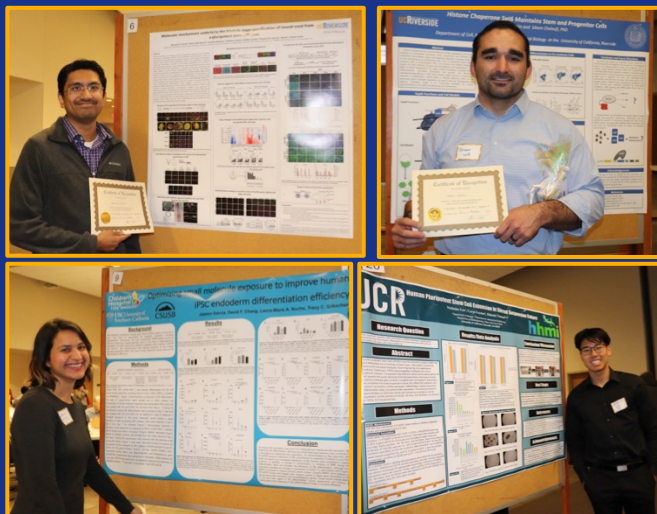
Personalized In Vitro Nerve Model, National Science Foundation, CBET-1805975
PI – Dr. Jin Nam

Have an announcement for the next newsletter? Email Dr. Rachel Behar (rbeha001@ucr.edu), the Academic Coordinator of the Stem Cell Core.

8th Annual Inland Empire Stem Cell Consortium Symposium

On November 1st, 2019, the 8th annual symposium was hosted by UCR. Researchers and students from Western University, UCR, Loma Linda University and California State University at San Bernardino came together to share a day of learning, networking, and discussing their latest stem cell research through podium and poster presentations.

Keynote speaker, Dr. Amander Clark from UCLA, opened the afternoon session and discussed her very exciting work on “Modeling Human Development with Pluripotent Stem Cells.”



Congratulations to the poster winners!

1st Place: Dr. Maneeshi S. Prasad (Garcia-Casto lab – UCR) Molecular Mechanisms Underlying The Blastula Stage Specification Of Neural Crest From A Pluripotent Stem Cell State

2nd Place – Reuben Franklin (Cheloufi Lab – UCR) Supt6 is involved in proliferating cell maintenance

Co-3rd Place – Jazmin Garcia (Grikscheit lab - CSUSB, CHLA) Optimizing small molecule exposure to improve human iPSC endoderm differentiation efficiency

Co-3rd Place – Nicholas Lee (Tsutsui Lab – UCR) Human Pluripotent Stem Cell Expansion in Stirred Suspension Culture

Stem Cell Center Outreach

Downtown Riverside's 2019 Long Night of Arts and Innovation

The Long Night showcased the best STEM and creative arts projects from local universities and school districts. It also featured innovative technologies deployed by companies like Bourns Inc., Siemens, SolarMax Technologies, and the city of Riverside fire and police departments.

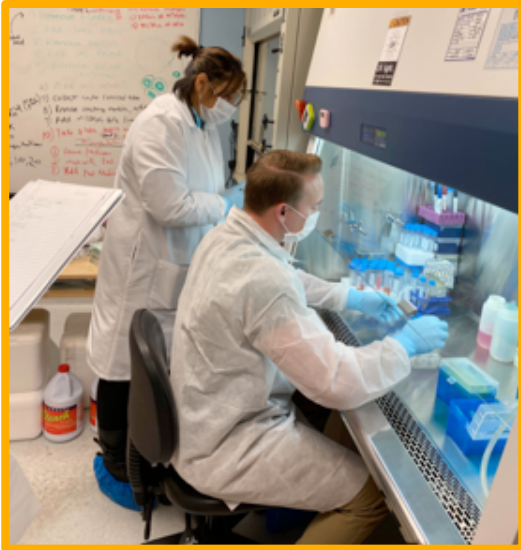


The Stem Cell Center hosted a table to educate the local community on the basics of stem cells, stem cell research, and projects being conducted at UCR. UCR had a great presence as we were alongside many other volunteer groups from UCR including the Microscopy Core and the School of Medicine.



UCR Training Course in Human Embryonic Stem Cell Culture (CMDB 211 – January 2020)

On January 24th, ten CIRM-Bridges students from California State University, San Bernardino completed an intensive 1-week pluripotent cell culture course in the Stem Cell Core Facility.



The ten students are all currently interning in stem cell research labs around Southern California – including UCR, UCI, and Loma Linda University, etc. This course is also open to UCR students who have a project that will utilize pluripotent stem cells. If you are interested in taking this course, please contact Dr. Rachel Behar (rbeha001@ucr.edu).

**Interested in learning more about stem cells?
Watch out for these courses in the future!**



CBNS 165 - Stem Cell Biology

CBNS 169 - Human Embryology

CMDB 207 - Stem Cell Biology and Medicine