

Department of Molecular & Cellular Biosciences Seminar

Friday, September 17, 12:30 – 1:30

Science Hall 126



To participate
remotely via Zoom:
Passcode: 250918

Dr. Amanda Fakira

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Department of Biomedical Sciences

Investigating the neurobiological function of GPR83, a recently deorphanized G-protein coupled receptor.



Abstract: GPR83, the receptor for the neuropeptide PEN, exhibits high expression in the nucleus accumbens of the human and rodent brain, suggesting that it plays a role in modulating the mesolimbic reward pathway. However, the cell-type specific expression of GPR83, its functional impact in the reward pathway, and in drug reward-learning has not been fully explored. Using GPR83/eGFP mice, we show high GPR83 expression on cholinergic interneurons in the nucleus accumbens and moderate expression on ventral tegmental area dopamine neurons. In GPR83 knockout mice, baseline dopamine release in the nucleus accumbens is enhanced which disrupts the ratio of tonic vs phasic release. Additionally, GPR83 knockout leads to changes in the expression of dopamine-related genes. Using the morphine conditioned place preference model, we identify sex differences in morphine reward-learning, show that GPR83 is upregulated in the nucleus accumbens following morphine conditioned place preference, and show that shRNA-mediated knockdown of GPR83 in the nucleus accumbens leads to attenuation morphine reward. Together, these findings detect GPR83 expression in the reward-pathway, and show its involvement in dopamine release and morphine reward-learning.

Biosketch: Dr. Fakira earned her PhD in Neuroscience from UMDNJ/Rutgers University in Newark, NJ in 2011. As a post-doctoral scientist at Columbia University Medical Center, working in the laboratory of Jose Moron-Concepcion, she examined morphine-induced synaptic plasticity in the hippocampus. From these studies, she has published several articles demonstrating the significant impact of pairing novel contextual cues with morphine administration on synaptic function and structural plasticity which influence morphine craving. Subsequently, she joined Icahn School of Medicine at Mount Sinai, as an Instructor, working under the supervision of Lakshmi Devi, where she continued her interests in identifying potential targets to alleviate opioid dependence. During this time, she identified the role of a neuropeptide receptor GPR83 as a potential target acting in both the pain and reward pathways. Before joining CMSRU, Dr. Fakira took on the role of managing an inaugural electrophysiology CORE facility at Mount Sinai under the direction of Robert Blitzer.