James & Esther King Biomedical Research Program

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Department of Physiology and Biophysics *2008 Program*
University of Miami *New Investigator (3-year project)*

Project Title: Investigation of SGLT3 and its Effect on the Activity of the Intestine

Project Summary: Cessation of smoking is often accompanied by constipation, which may be defined as a lack of peristalsis and intestinal motility, and patients often resort to self-medication by resumption of smoking. The enteric nervous system (ENS) includes two networks of neurons called plexuses, located within the walls of the intestine. These neurons contain receptors for nicotine, the addictive component of tobacco. Many of these neurons control the smooth muscles of the gastrointestinal tract, regulating peristalsis and clearing of intestinal contents. Recently, we showed that a newly identified protein known as SGLT3 that binds sugars is co-localized with nicotine receptors in the intestinal plexuses. Our preliminary data suggest that sugars that bind and activate SGLT3 cause intestinal contraction in isolated intestine, and that intestinal contraction is damped when SGLT3 is blocked. This grant is investigating the effects that SGLT3 activity has on intestinal motility. We are investigateing the activity of SGLT3, how it affects the function of intestinal neurons, and how activators and inhibitors of SGLT3 affect nicotine-induced intestinal contractions. A full understanding of the function of SGLT3 and its role in intestinal motility may lead to effective treatments for the constipation that often accompanies cessation of smoking, thus leading to increased success in quitting.