

James & Esther King Biomedical Research Program

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*Neurology
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Postdoctoral Research Fellowship
(2-year project)*

Project Title: Nicotine Exacerbates Post-ischemic Cerebral Blood Flow Derangements After Cardiac Arrest

Project Summary: Tobacco smoke is responsible for increased risk for cardio- and cerebrovascular diseases. Nicotine, the addictive component of tobacco smoke, is responsible for cardiovascular deficits such as heart rate and blood pressure. Enhanced nicotine levels can cause cardiac arrhythmias, contributing to cardiac-related sudden death. Thus, cardiopulmonary arrest remains one of the leading causes of death and disability in the U.S. Survival rates following cardiac arrest (CA) are poor, despite prompt emergency treatment and better resuscitation techniques. Of 70,000 patients per year that are resuscitated after CA, 60 percent die from extensive brain injury and only 3–10 percent are able to resume their former lifestyles. Most neuroprotective trials for cerebral ischemia (restriction in blood supply) have been unsuccessful; therefore, new drug interventions are greatly needed. Our goal in this project is to further our understanding of nicotine's involvement in brain circulation after CA in order to lay the foundation for a common therapy and greatly improve the outcome from nicotine-enhanced CA. Utilizing in vivo and in vitro cerebral blood flow (CBF) detection techniques, we plan to: define the role of nicotine as it relates to CBF after CA and determine the specific factors involved in promoting CBF derangement after CA.