Grant Number: 1K01NR010910-01

Project Title: Effect of Perinatal Nicotine Exposure on the Development of Autonomic Responses

Abstract: DESCRIPTION (provided by applicant): The candidate needs additional knowledge skills in developmental neurobiology to allow her to continue her long-term goals of elucidating factors that affect the health and well-being of infants, and to develop age appropriate, non-invasive tests that will identify infants who are at greatest risk for Sudden infant death syndrome (SIDS). For this proposal the candidate will work under the supervision of Dr. Slotkin, Duke University, and Dr. Myers, Columbia University. Both of these researchers are experts in the field of developmental neurobiology and work at research intensive institutions that will offer the experiences for the success of this plan. Candidate development: 1. Complete course work in neurobiology and developmental neurobiology. 2. Spend extensive time in the laboratory learning neurobiologic techniques. 3. Test the research Aims described below. 4. Develop the skills of collaboration, mentoring, leadership, and scientific writing. Nicotine exposure during pregnancy is responsible for many alterations of neurologic development including; behavioral disorders, depression, addiction, and SIDS. SIDS is the leading cause of infant mortality in developed countries. Infants born to mothers who smoke are 4 times more likely to die of SIDS. Substantial evidence from animal studies shows that nicotine produces impairment of brainstem and autonomic nervous system function consistent with SIDS and other developmental disabilities. The candidate will use an animal model she developed that accounts for environmental, developmental and age risk factors identified for SIDS deaths. Pilot data from this model have already shown an increase in mortality with perinatal nicotine exposure. Specific research aims: Aim 1: Verify the mortality found in pilot data in the nicotine/influenza/endotoxin model Aim 2: Establish procedures for assessing autonomic and blood pressure responses Aim 3: Determine the autonomic/cardiovascular mechanisms underlying the decreased survival. Aim 4: Examine specific actions of autonomic response by blocking sympathetic or parasympathetic pathways with pharmacologic agents.