

American Heart Association Tobacco Center for Regulatory Science (A-TRAC) 2.0

Institution: American Heart Association

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Project 2: Cardiovascular Injury due to Tobacco Use

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Project 2 Abstract:

Consistent with the integrative cardiovascular theme of ATRAC, the overall aim of Project 2 is to assess and evaluate the cardiovascular effects of non-cigarette tobacco products and to determine whether cardiovascular injury due to the use of tobacco products is mediated, in part, by exposure to volatile organic chemicals (VOCs) present in or generated by tobacco products. The working hypothesis is that exposure to tobacco products leads to cardiovascular injury and dysfunction, induced in part by tobacco product-derived VOCs. To test this hypothesis, the team will expand its existing Cardiovascular Injury due to Tobacco Use (CITU) cohort to evaluate both short- and long-term effects, specifically of cigarillos and e-cigarettes on cardiovascular health and disease risk. To evaluate the cardiovascular impact of tobacco products, Project 2 investigators will examine differences in biomarkers of endothelial injury, inflammation and thrombosis, as well as indices of vascular function and cardiac electrophysiology, and determine whether the extent of cardiovascular injury induced by tobacco products is proportional to VOC exposure, assessed by the levels of urinary VOC metabolites in tobacco product users. To evaluate the acute effects of tobacco products, Project 2 investigators will determine changes in indices of cardiovascular injury before and after the use of tobacco products and examine how the extent of injury relates to the extent of VOC exposure. To identify cardiovascular disease risk due to chronic use of e-cigarettes and cigarillos, the team will identify progressive changes in cardiovascular injury and dysfunction in a longitudinal, prospective evaluation of our pre-established cohort of participants (CITU). The project addresses the scientific domains of Health Effects and Toxicity, and the results of this work will provide new, significant, and unique information relevant to the highest priority areas of the FDA/CTP – i.e., the cardiovascular health effects of noncigarette tobacco products. The elucidation of such effects could lead to the development of new health warnings, and delineation of the contribution of VOCs to the cardiovascular toxicity of tobacco products would aid in setting device standards and regulatory policy relevant to manufacturing practices and design characteristics of tobacco products.