

CITIZEN SCIENCE APPROACH FOR SEARCHING AND CURATING LITERATURE OF THE EFFECTS OF SPACEFLIGHT ON CARDIOVASCULAR OUTCOMES IN RODENTS AND HUMANS

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The spaceflight environment causes significant changes to the structure and function of the cardiovascular system, including fluid redistribution, alterations in blood pressure, and changes in cardiac output. The goal of this project is to quantitatively summarize the data on the effects of actual or simulated microgravity and radiation exposure resulting from spaceflight on the cardiovascular system. As the first step, a group of investigators approached through a collaboration of the Ames Life Science Data Archive (ALSDA) Analysis Working Group developed a list of relevant cardiovascular search terms. Based on these, medical librarians generated and executed the search strategy in Medline, CINAHL, Embase and NASA repositories. In parallel, we recruited students and young professionals from various space industry-affiliated organizations, resulting in ~100 individuals joining. With this program we aimed to reach students and young people underrepresented in STEM, including first-generation, female, minorities, disadvantaged backgrounds, fostered individuals, etc. These individuals completed a virtual training course on the nature and methodologies of the project. Following this, the participants were structured into teams with more senior/experienced individuals designated as team leaders. Currently, the teams are screening approximately 15,000 studies using the systematic review tool, Covidence. Teams will be extracting and curating data for meta-analysis of the cardiovascular spaceflight literature, but also extracting, submitting, and curating appropriate datasets into the new ALSDA submission portal and repository. This effort will result in collaborative publications based upon the literature meta-analyses, and a number of publicly accessible datasets for reuse, modeling, machine learning, and knowledge graph-type approaches. This approach reduces the length of time to complete title/abstract screening time from 1-2 years needed for this volume of studies, to 3-4 months, while also providing a unique, open-access educational experience to space research and training in knowledge synthesis tools to interested individuals.