Examining Individual Differences in the Temporal Profiles of Cardiovascular Responses to Head-Down Tilt With and Without Fluid Loading: Narrowing the Gap [#3127]

Postflight orthostatic hypotension is a significant health risk for astronauts returning from space. In this study head down tilt was used to simulate effects of micro-g. It was found that the optimal time for administering fluid loading, the current countermeasure, is 2–3 hours prior to re-entry.

The Influence of Microgravity on the Cardiomyocyte Proteome [#3167]

We investigated the effect of microgravity on the proteome of cultured primary heart cells. Microgravity significantly affected the proteomic profile; specifically translational proteins are down regulated. This suggests that a decrease in protein translation may precede cardiac atrophy in astronauts.

Development of a NASA/NSBRI Risk Calculator to Estimate the Short Term Risk of an Acute Coronary Event in Astronauts: ASTRO-CHARM [#3291]

Accurate determination of CV risk of current eligible astronauts is critical to the success of NASA missions. We present a new tool, the ASTRO-CHARM, which is an integrated cardiovascular risk calculator including traditional risk factors and coronary artery calcium scores.

Radiation Endothelial Cell Senescence, Accelerated Aging in Coronary Vasculature [#3322]

Epidemiological studies show a strong correlation between ionizing radiation (IR) exposure and risk of developing coronary artery disease (CAD). CAD is documented in breast cancer patients undergoing radiotherapy where the heart is in the field of the radiation beam.

Radiation Induced Protein and Post-Translational Modification Changes in Mouse are Indicative of Oxidative Stress and Cardiovascular Disease [#3331]

Astronauts are not immune to genetic and environmental perturbations leading to cardiovascular disease. Prolonged exposure to galactic cosmic radiation-GCR, which induces oxidative stress in cells, could exacerbate and accelerate the onset of pathophysiologic processes resulting in vascular disease.