Apollo Lunar Astronauts Show Higher Cardiovascular Disease Mortality: Possible Deep Space Radiation Effects on the Vascular Endothelium

[§]Michael D. Delp, Ph.D.¹, Jacqueline M. Charvat, Ph.D.², Charles L. Limoli, Ph.D.³, Ruth K. Globus, Ph.D.⁴ and Payal Ghosh, Ph.D.¹

¹Department of Nutrition, Food and Exercise Sciences, Florida State University, Tallahassee, FL 32306,

²Wyle Science, Technology and Engineering Group, Johnson Space Center, Houston TX 77058,

³Department of Radiation Oncology, University of California Irvine, Irvine, CA 92697,

and

⁴Space Biosciences Division, NASA Ames Research Center, Moffett Field, CA 94035

§Correspondence: Michael D. Delp, Ph.D.

mdelp@fsu.edu

Supplementary Figure Legends

- Figure 1. Effects of HU, TBI, and TBI+HU on vasoconstrictor responses to A) KCI and B) phenylephrine in gastrocnemius muscle feed arteries. Values are mean \pm SE. *n* = the number of animals studied. Vasoconstrictor responses are not different among groups.
- Figure 2. Effects of HU, TBI, and TBI+HU on A) active myogenic vasoconstrictor responses and B) passive pressure-diameter responses of gastrocnemius muscle feed arteries. Values are mean \pm SE. *n* = the number of animals studied. Responses are not different among groups.
- Figure 3. Effects of HU, TBI and TBI+HU on A) endothelial nitric oxide synthase (eNOS), B) superoxide dismutase-1 (SOD-1), and C) NADPH oxidase-2 (NOX-2) protein levels in gastrocnemius muscle feed arteries. Values are mean ± SE.
- Figure 4. Effects of HU, TBI and TBI+HU on A) endothelial nitric oxide synthase (eNOS), B) superoxide dismutase-1 (SOD-1), and C) NADPH oxidase-2 (NOX-2) protein levels in coronary arteries. Values are mean ± SE.



A.



Potassium Chloride (mM)



Supplemental Figure 2









A.



C.

β-Actin, 42kDa