

Use of Aquaporins to Achieve Needed Water Purity On ISS for the EMU Space Suit System

Terry R. Hill – Brandon W. Taylor
terry.hill-1@nasa.gov – brandon_taylor@baylor.edu
NASA's Lyndon B. Johnson Space Center
2101 NASA Parkway
Houston, Texas 77058

Abstract

“Use of Aquaporins to Achieve Needed Water Purity On ISS for the EMU Space Suit System.” With the U.S. Space Shuttle fleet retired, the supply of extremely high-quality water “super-Q” - required for the EMU Space suit cooling on this ISS - will become a significant operational hardware challenge in the very near future. A proposed potential solution is the use of a filtration system consisting of a semi-permeable membrane embedded with aquaporin proteins. Aquaporins are a special class of trans-membrane proteins that facilitate passive transport of water and other substances across a membrane. The specificity of these proteins is such that only water is allowed through the protein structure, and this novel property invites their adaptation for use in water filtration systems, specifically usage on the ISS for the EMU space suit system. These proteins are found in many living systems and have been developed for commercial use today.