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MICROBES AND SALTY WATER: NEW DATA WITH IMPLICATIONS FOR PLANETARY
PROTECTION ON MARS**Abstract**

Recent investigations on the limits of Earth life in Mars-like conditions have demonstrated that common microbes, including human commensal organisms, can grow under Mars surface temperature, pressure, and atmospheric conditions [1]. Additionally, several studies reported recently have used soil composition data from recent Mars missions, such as Phoenix, to investigate the physical behavior of realistic brine mixtures in Mars-like conditions, and demonstrate that some brines can remain liquid at temperatures below 200K, significantly lower than previously expected [2]. Conclusions from these two areas of research highlight the potential for Earth organisms to grow and be transported in the near-subsurface of Mars, and elevates the level of concern for planetary protection and the refinement of parameters defining Special Regions on Mars. Implications for future missions will be discussed in this paper.

Ref. [1] Schuerger, A.C., R. Ulrich, B.J. Berry, and W.L. Nicholson. Growth of *Serratia liquefaciens* under 7 mbar, 0C, and CO₂-enriched anoxic atmospheres. *Astrobiology* 13:1-17, 2013 [2] Dickson, J.L., J.W. Head, J.S. Levy and D.R. Marchant. Don Juan Pond, Antarctica: Near-surface CaCl₂-brine feeding Earth's most saline lake and implications for Mars. *Scientific Reports* 3:1166, 2013