

**The Viking Labeled Release Experiment:
Current Status of Flight Data and Laboratory Simulations**

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The Viking Labeled Release (LR) extraterrestrial life detection experiment onboard the Viking spacecraft on Mars has now (5/77) completed all radiorespirometric analyses of the Martian surface material. Both landing sites provide remarkably similar evolution of radioactive gas upon addition of the ^{14}C -labeled radioactive nutrients. The active response is consistent with a microbiological response, as is the control. However, possible non-biological explanations remain (1/77) and center around UV-induced soil activation, perhaps mediated by peroxides or superoxides. Laboratory experiments with Mars analog soils indicate that treatment with various peroxides or radiation doses can cause a positive LR response. The quantitative aspects of the laboratory simulation of active and control cycles will determine the acceptability of a chemical explanation of the observations on Mars. Failing that, the biological explanation will gain strength.