WSU astrobiologist proposes fleet of probes to seek life on Mars

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Washington State University astrobiologist Dirk Schulze-Makuch is leading a proposal to send a small fleet of life sensors to Mars. Credit: Washington State University

A Washington State University astrobiologist is leading a group of 20 scientists in calling for a mission to Mars with "a strong and comprehensive life detection component." At the heart of their proposal is a small fleet of sensor packages that can punch into the Martian soil and run a range of tests for signs of ancient or existing life.

They call the mission BOLD. It's both an acronym for Biological Oxidant and Life Detection and a nod to the proposal's chutzpah. The proposal, which comes as NASA is reevaluating its Mars exploration program, appears in the journal *Planetary and Space Science*.

"We really want to address the big questions on Mars and not fiddle around," says Dirk Schulze-Makuch, whose earlier proposals have included an economical one-way trip to the red planet. "With the money for space exploration drying up, we finally have to get some exciting results that not only the experts and scientists in the field are interested in but that the public is interested too."

The BOLD mission would feature six 130-pound probes that could be dropped to various locations. Shaped like inverted pyramids, they would parachute to the surface and thrust a soil sampler nearly a foot into the ground upon landing. On-board instrumentation would then conduct half a dozen experiments, transmitting data to an orbiter overhead.

The soil analyzer would moisten a sample and measure inorganic ions, pH and light characteristics that might get at the sample's concentration of hydrogen peroxide. Schulze-Makuch has hypothesized that microbial organisms on Mars could be using a mixture of water and hydrogen peroxide as their internal fluid. The compound might also account for several of the findings of the Viking Mars landers in the late 1970s.

The probe's microscopic imager would look for shapes similar to known terrestrial microfossils.

Another instrument would look for single long molecules similar to the long nucleic acids created by life on earth.

Some experiments would repeat work done by the Viking landers but with a greater precision that could detect previously overlooked organic

material.

Each probe would have about a 50-50 chance of landing successfully. But with the redundancy of six probes, the chance of one succeeding is better than 98 percent.

Provided by Washington State University