

## **Searching for life on Mars and beyond: Using Fluorescence Biological Analysis (FBA) to Examine the Subsurface of Europa for Signs of Life.**

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Recent evidence suggest that water was once present in large amounts on Mars. In fact, Mars may have been habitable. Another location that is high on NASA's search for life outside of our earthly parameters is Europa, one of Jupiter's Icy Moons. Two important components essential to life include the present of water and a source of energy. As a result of these two factors, multiple theories suggest the possibility of life on Europa. The surface of Europa is composed of thick layers of ice produced by the combination of an underwater ocean and extremely low temperatures. The underwater ocean is a result of expected volcanic activity along the ocean's floor. The area between the thick layers of ice and the underwater ocean is potential breeding ground for a host of bacteria, cells, and biomolecules. The fluorescence biological analysis system is a direct result of cutting edge technology and innovative biological research. This system consists of an orbiter and a penetrator with various tools and instruments needed to complete this mission. The orbiter will use jet propulsion to launch the penetrator, forcing it into the surface of Europa in order to examine the subsurface in situ. Samples of water will be collected and immediately examined using fluorescence biological analysis. Fluorescence is a proven method used for locating organic molecules that are present within a specific region.

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