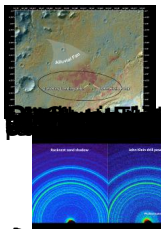
An analysis of a rock sample collected by NASA's Curiosity rover shows ancient Mars could have supported living microbes.

Scientists identified sulfur, nitrogen, hydrogen, oxygen, phosphorus and carbon -- some of the key chemical ingredients for life -- in the powder Curiosity drilled out of a sedimentary rock near an ancient stream bed in Gale Crater on the Red Planet last month.

"A fundamental question for this mission is whether Mars could have supported a habitable environment," said Michael Meyer, lead scientist for NASA's Mars Exploration Program at the agency's headquarters in Washington. "From what we know now, the answer is yes."

Clues to this habitable environment come from data returned by the rover's Sample Analysis at Mars (SAM) and Chemistry and Mineralogy (CheMin) instruments. The data indicate the Yellowknife Bay area the rover is exploring was the end of an ancient river system or an intermittently wet lake bed that could have provided chemical energy and other favorable conditions for microbes. The rock is made up of a fine-grained mudstone containing clay minerals, sulfate minerals and other chemicals. This ancient wet environment, unlike some others on Mars, was not harshly oxidizing, acidic or extremely salty.

The patch of bedrock where Curiosity drilled for its first sample lies in an ancient network of stream channels descending from the rim of Gale Crater. The bedrock also is fine-grained mudstone and shows evidence of multiple periods of wet conditions, including nodules and veins.



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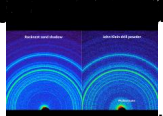

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