

## The role of hydrogen activation in early metabolism

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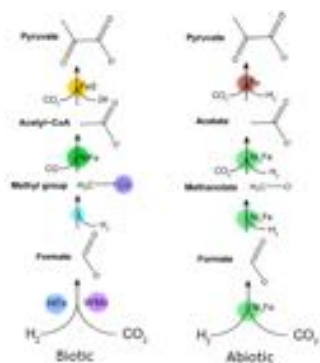
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The probably most ancient CO<sub>2</sub> fixing metabolic pathway is – simply put – the catalyzed reaction between H<sub>2</sub> and CO<sub>2</sub>, the product of which is an activated acetyl group. We are investigating the possible transition between geochemical H<sub>2</sub>/CO<sub>2</sub> redox reactions to biochemical reactions in the so-called Wood-Ljungdal (acetyl-CoA) pathway and thereby showing the crucial role of H<sub>2</sub> activation with transition metals - possibly via minerals found in serpentinizing hydrothermal systems like awaruite (Ni<sub>3</sub>Fe) or magnetite (Fe<sub>3</sub>O<sub>4</sub>).



**Fig.:** The parallels between the biotic CO<sub>2</sub> fixation in the acetyl-CoA pathway and the products and intermediates we are observing in our abiotic CO<sub>2</sub> fixation with minerals found in serpentinizing systems are striking.

**References:** (1) M. Preiner et al., *Life* 8, 41 (2018) (2) F. L. Sousa et al., *Curr Opin Microbiol* 43, 77–83 (2018)