

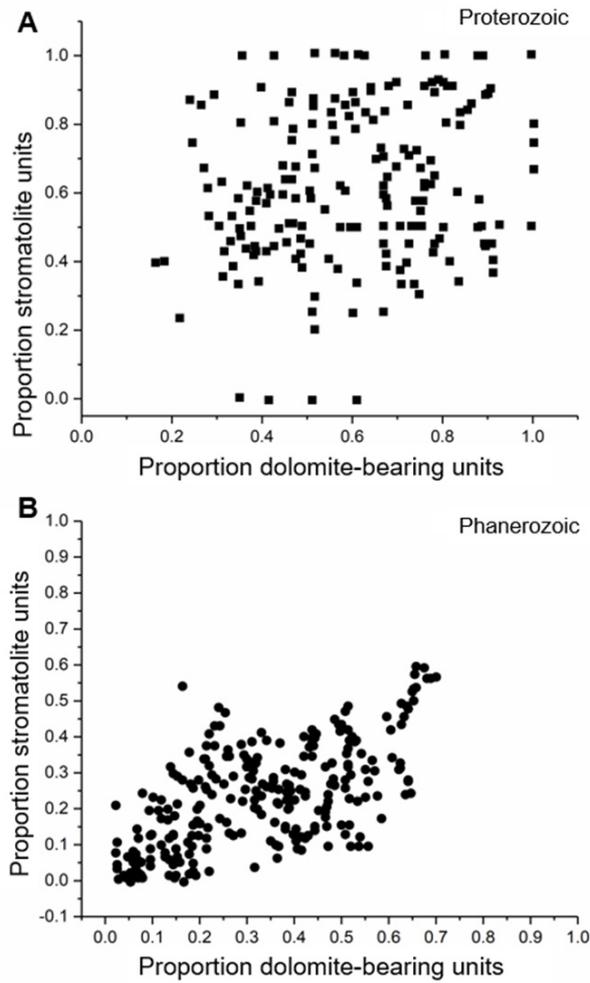
## **Supplementary Materials**

Dissolved silica-catalyzed disordered dolomite precipitation

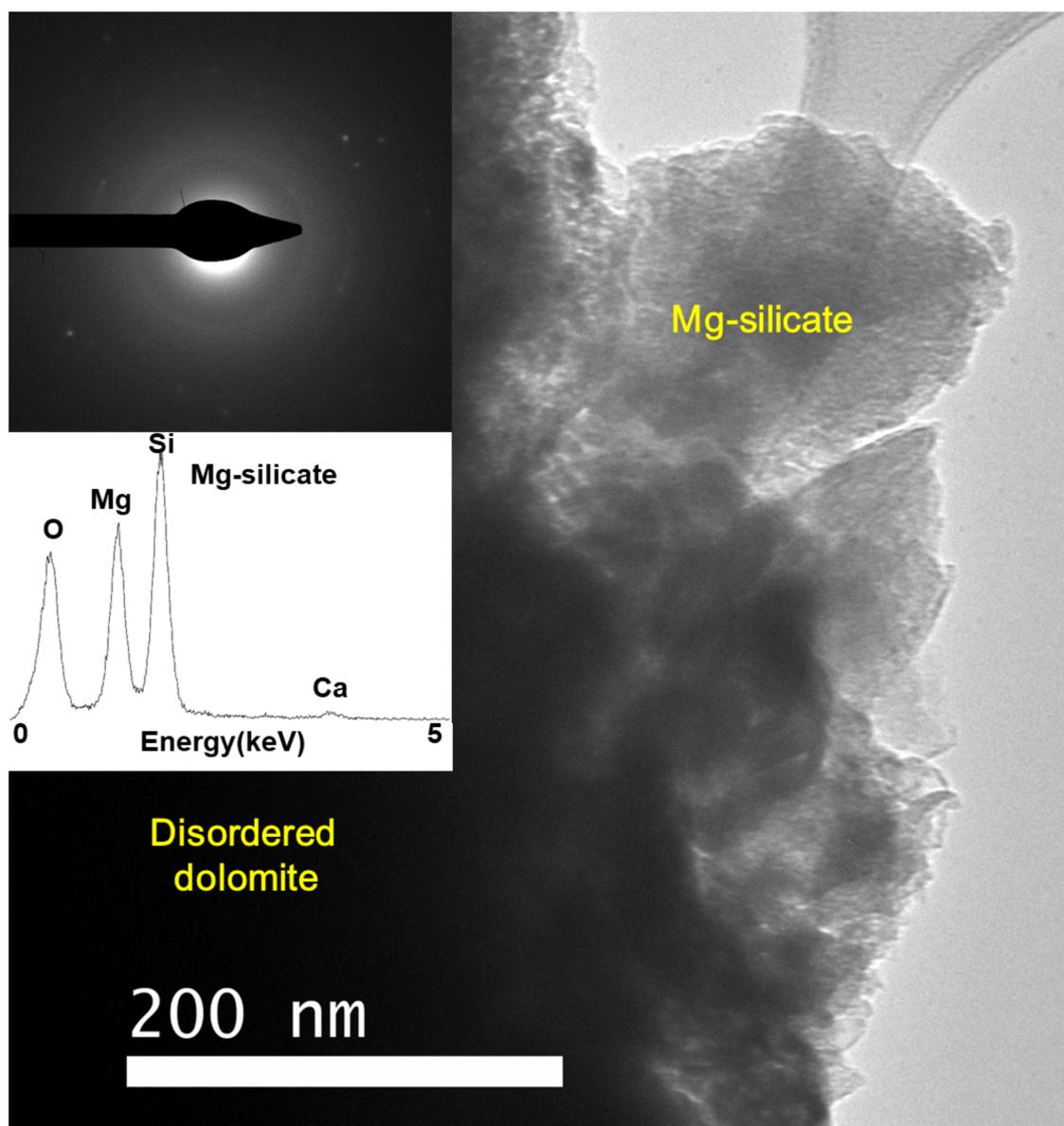
**Yihang Fang<sup>1</sup>, Huifang Xu<sup>1\*</sup>**

<sup>1</sup> NASA Astrobiology Institute, Department of Geoscience, University of Wisconsin–  
Madison, 1215 W Dayton St, Madison, Wisconsin, 53706, USA

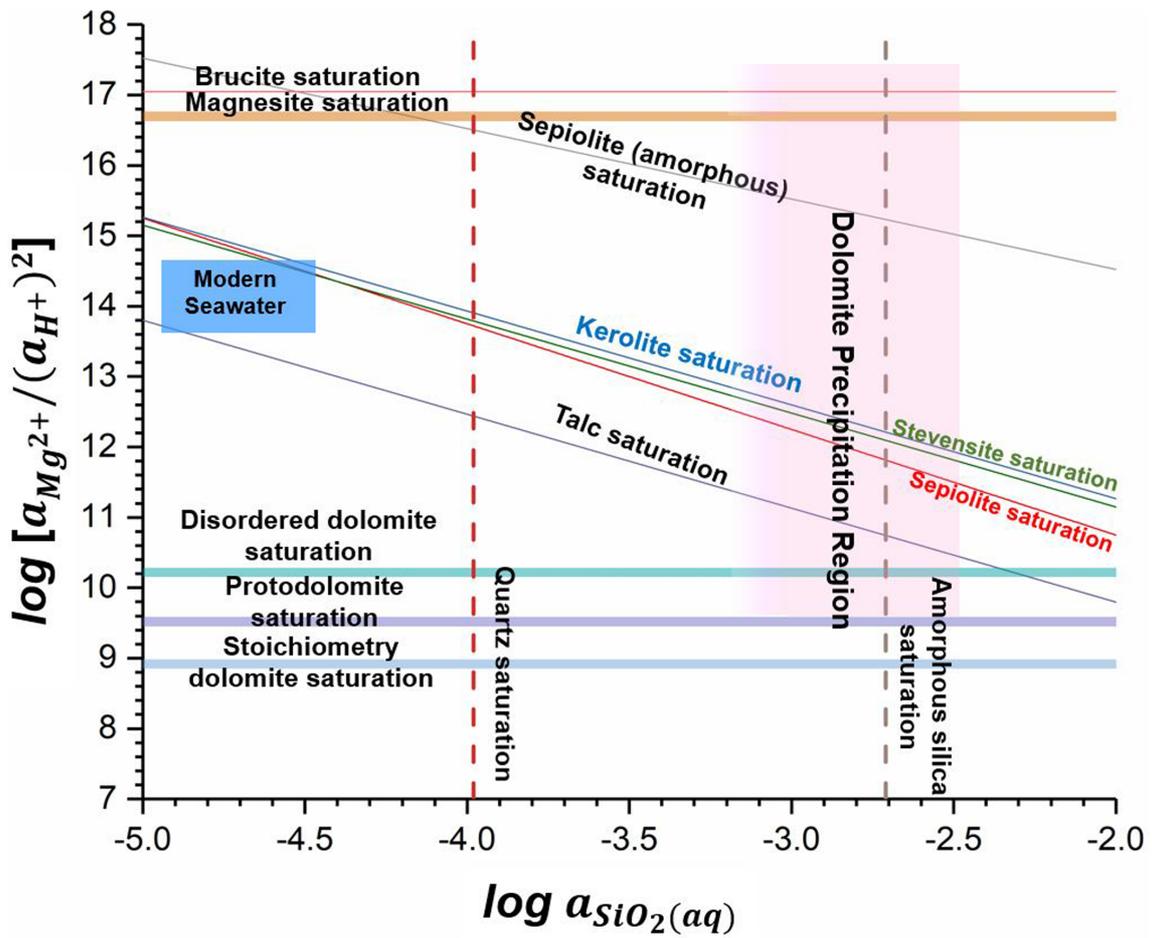
\*Corresponding author: [hfxu@geology.wisc.edu](mailto:hfxu@geology.wisc.edu)



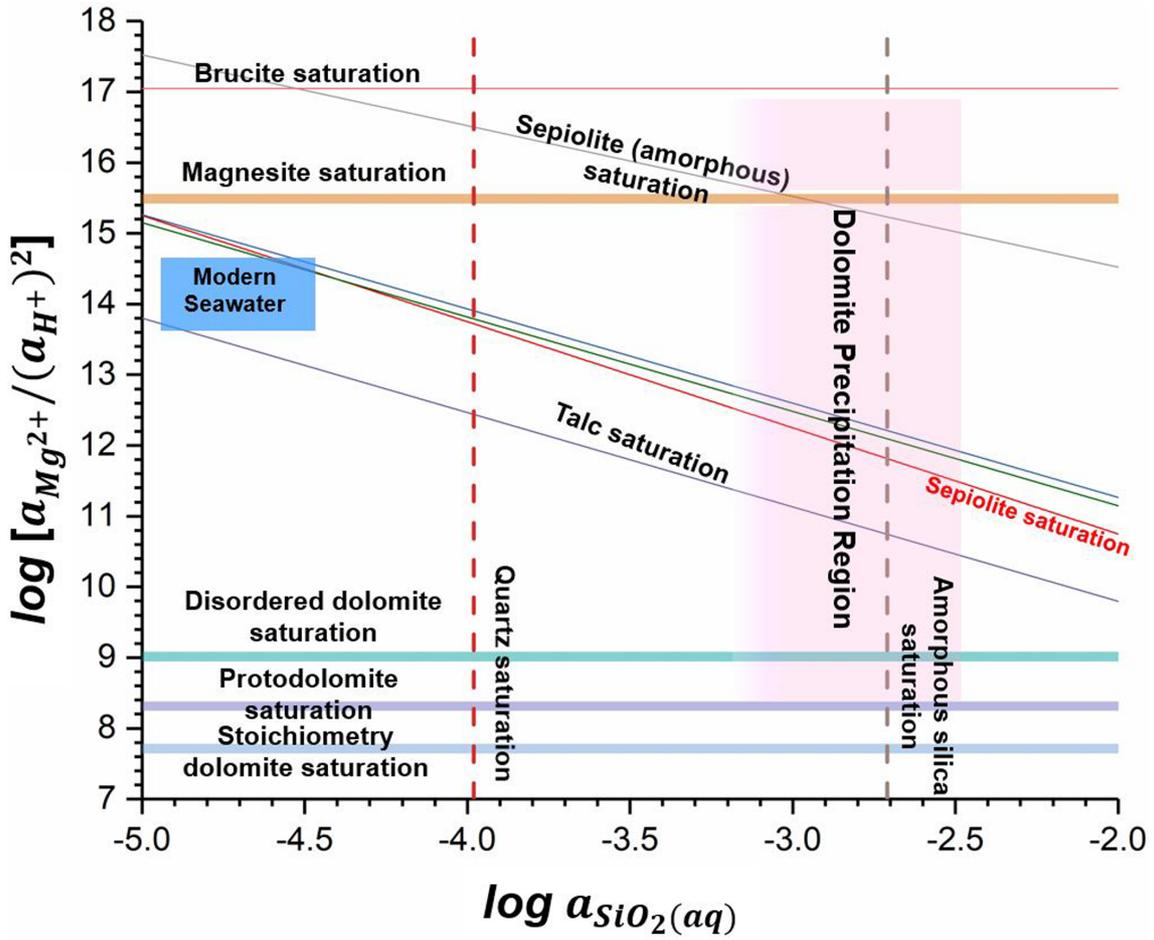
Supplemental Figure OM1. Correlation between dolomite and stromatolite (Peters et al., 2017) in A) Proterozoic and B) Phanerozoic. Dolomite precipitated in Proterozoic do not show clear correlation with microbial activity.



Supplemental Figure OM2. TEM image of amorphous Mg-silicate on the edge of disordered dolomite with SAED (upper left corner) and EDS spectrum (center left).



Supplemental Figure OM3. Activity diagram of solution. Saturation of different mineral phase are based on  $\log K$  value with fixed pH = 8.5,  $[Ca^{2+}] = 10$  mM, and fixed  $[CO_2] = 1000$  ppm at 20°C.



Supplemental Figure OM4. Activity diagram of solution. Saturation of different mineral phase are based on  $\log K$  value with fixed pH = 8.5,  $[Ca^{2+}] = 10$  mM, and fixed  $[CO_2] = 4000$  ppm at 20°C.