

for each OTU are given on the right. The scale bar indicates the number of substitutions per site for a unit branch length. (TIF)

**Figure S14** Hypothetical model of carbonate formation dynamics based on known metabolisms of microbial lineages detected in Alchichica microbialites. The panels represent the activities that would occur during day (left) and; night (right) in areas where oxygenic (upper panels) or anoxygenic (lower panels) photosynthesis predominates. (TIF)

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## Author Contributions

Conceived and designed the experiments: PL-G DM KB. Performed the experiments: EC EG. Analyzed the data: EC PL-G DM. Contributed reagents/materials/analysis tools: PL-G KB. Wrote the paper: EC PL-G DM KB. Field work: PL-G DM JK RT.