

**WIU CENTENNIAL HONORS COLLEGE**  
**Thomas E. Helm Undergraduate Research Day 2023**

**Abstract**

Poster

Major: Geology

Faculty Mentor(s): Leslie Melim

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**Silicification of trilobites & brachiopods and biofilm from multiple locations: Evidence of microbial involvement in all silicified fossils**

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Silicification is the complete or partial replacement of the original skeleton due to calcium carbonate dissolution and silica precipitation. While there is no direct evidence, the role of microbes is accepted within this study. Microbes decaying organic matter within the bioclasts itself, is the triggering effect of silicification. Melim et al. (2023) reports on one location, the Weeks Fm, Utah and is the first paper to prove direct evidence of microbial involvement by finding silicified biofilm on silicified trilobites and in the surrounding matrix. I hypothesize that the Weeks Fm is not unique, the evidence of microbial biofilm is more widespread and is present in all silicified fossils. Reporting on silicified trilobite sclerites from two locations in the Cambrian Pioche Fm, Utah, one location from the Cambrian Sesong Fm, Taibaek Group, Korea Republic, and one location containing a silicified brachiopod from the Permian Glass Mountains, Texas. Within three of the four locations, we can identify carbon-rich ribbons that appear, going in and out of the silica and carbon-rich mats with a crunchy-looking texture. One location (27-2) from the Cambrian Pioche Fm is filled with sand sized (60-100 $\mu$ m) micas and had no evidence of microbial involvement in the silicification. The carbon-rich features are interpreted as microbial biofilm. The large micas from location 27-2 might be metamorphic, which perhaps destroyed any evidence of microbial biofilm.