

**Centennial Honors College**  
*Western Illinois University*  
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**Poster Presentation**

**Color Patterns in Trilobite Carapaces**

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**Geology**

For my project, I will work on diagnosing the origin of colored 'spots' present on the carapace (external shell) of several phacopid trilobites (Devonian, upstate NY). The phrase colored 'spots' is used descriptively; not to imply original biological color. In order to understand the origin of these spots on the trilobites' carapace, we will examine the structure and composition of the spots and compare it with specimens that lack such spots. Because these color patterns are so uniform, both in shape and in placement, they suggest that a preserved biological structure worked to confine the preservation, such as muscle attachment sites. The question is whether there was mineralization localized to these sites, or preservation of the actual muscle fibers.

To determine the true cause of these colored spots, we will slice the trilobites into thin sections, which we will study under a microscope, to allow us to see the crystalline structure and mineralogy of the carapace. Also, we will acid etch and examine the slides under a scanning electron microscope, which will allow us a detailed view of the shell's microstructure. This will help us establish whether the spots are located at muscle attachment sites. Finally, we will examine the thin-sections with energy dispersive x-ray spectroscopy, which will map the precise elemental composition of the trilobite's carapace, in order to identify trace amounts of organic material, or confirm an alternate mineralogy. Through these analyses, we will be able to compare the spotted to the unspotted cuticle; the differences between them will help us determine the cause.