

Abstract Submitted  
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**Biomimicry of Fish Scales to Design an Environmentally Friendly Mesh to Aid in Oil Spill Clean Up**<sup>1</sup> MADOLYN KELM, Willamette University — Oil spills are both detrimental to marine ecosystems and difficult to clean up. Conventional clean-up methods are often inefficient and harmful to the environment, leading researchers to look “outside” the box for new methods - to nature. While many forms of wildlife, such as birds, become debilitated in the presence of oil, fish - even though still damaged by the *chemical* effects of the contamination - remain largely clean. This is because fish scales have unique oleophobic, or oil repelling, and hydrophilic, or water-attracting properties, that only become apparent underwater. This property is largely attributed to the microscopic structures found on fish scales. Using biomimicry, we can recreate these microstructures of the fish scales through the process of laser ablation. Over the summer we started exploring how altering the laser scan speed and the metallic properties of our samples affects the wettability. We improved our wettability measurement system to quantify not only the in-air hydrophobicity of our samples, but also quantify the inverse relationship of the underwater hydrophilic/oleophobic properties that are observed by fish scales. This is an important first step in determining how effective our laser ablated samples will be at oil/water separation.

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