

**Title** – Cannabinoid Receptor Modulators for the Treatment of Liver Fibrosis

**Program of Study**- Biology/Chemistry

**Presentation Type**- Print Poster

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### **Abstract**

This research intends to address the issue of non-alcoholic fatty liver disease. This disease is accompanied by the accumulation of fat in the liver that can result in inflammation of the liver, cirrhosis, steatohepatitis (NASH), and potentially even liver failure. The increase in obesity in the United States has led to a rise in the number of people affected by this disease, which demonstrates the demand for research in this field. A proposed mechanism for mitigating both alcoholic and non-alcoholic liver fibrosis involves the CB1 and CB2 cannabinoid receptors found in the liver. While CB1 receptors can facilitate liver fibrosis, the antagonists can be anti-fibrotic. CB2 receptor agonists have also shown to be anti-fibrotic as well. Based on these findings, this research hypothesizes that a compound which contains both CB1 antagonist activity and CB2 agonist activity would be highly effective in attenuating liver fibrosis. However, research has demonstrated that CB1 antagonists have adverse effects on the central nervous system – the brain and spinal cord. Therefore, the hypothesized compound should not be able to penetrate the central nervous system, but instead affect only the peripheral nervous

system. This research focuses on tethering a peripherally selective CB1 antagonist with one of four different compounds with known CB2 agonist activity. Tethering these compounds together could affect both CB1 and CB2 receptors, thus rendering the compound more effective. Once synthesized, these compounds will undergo testing to determine their effect on the cannabinoid receptors and liver fibrosis. This research should serve as the basis of cannabinoid receptor modulator development, potential NASH treatment, and potentially develop interest in the liver fibrosis field.