The purpose of this research is to synthesize two novel retinoids for future testing regarding receptor efficacy.

**Background**

- 1999 - FDA approves Bexarotene, a retinoid, as a therapeutic regimen for Cutaneous T-Cell Lymphoma
- As a retinoid, Bexarotene induced the apoptosis cutaneous T-cell lymphoma cells within pre-clinical in vitro and in vivo studies (Querfeld, 2006)
- 2012 - Correlation between Retinoid X Receptors (RXR) and Alzheimer’s Disease (AD) via induction of two receptors that play a key role in the transcription of apolipoprotein, one of the greatest risk factors for developing AD. Bexarotene showed:
  - Clearance of beta-amyloid plaques, the primary cause of neurodegenerative symptoms in AD
  - Regression of social, cognitive, and sensory deficits (Cramer, 2012)
- Replicative studies were not able to achieve the same results, but all studies found cognitive improvements
- Replicative studies used "unconventional formulations of bexarotene" (Tousi, 2015)
- Different analogs of Bexarotene have been hypothesized to induce RXR with differing levels of efficacy.

**Conclusion/Future Research**

Final products were successfully obtained, achieving nearly a gram of each, which is found to be consistent with previous trials of similar research. $^1$H-NMR and $^{13}$C-NMR were utilized throughout the synthesis as confirmatory tests of the molecular structure. In the future, these synthesized compounds will be tested in yeast 2-hybrid assays in order to test the efficacy of binding to RXR receptors when compared to previously tested retinoids/rexinoids. These future studies can also help elucidate the mechanism of action of the retinoids/rexinoids in treating and managing AD.

Research reported in this poster was supported by the National Institute of Environmental Health Sciences of the National Institutes of Health under award number 1R25ES030238-01.

**References**

