

Non-Confidential Description - PSU No. 3581
“Rapid Cell-based Screen for Aryl Hydrocarbon Receptor (AHR)
Selective Ligands and Modulators of Niemann-Pick C1-like 1 Protein”

Field of the Invention:

Research tools – cell lines, Cholesterol Uptake,
Selective AHR ligands, Atherosclerosis and
Rheumatoid Arthritis

Links:

[Inventor Website](#)

Inventors:

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Background

The aryl hydrocarbon receptor (AHR), a ligand-activated transcription factor, has an established role in xenobiotic metabolism, driving the expression of detoxification enzymes. Recent evidence suggests that AHR may also exert modulatory effects on diverse cellular processes through the phenomenon of receptor cross-talk (i.e. through a non-DNA binding mechanism), as described more fully in the peer-reviewed publication “Ah receptor represses acute-phase response gene expression without binding to its cognate response element” (RD Patel, *et al.*, Laboratory Investigation, 2009). However, AHR’s ability to alter inflammatory gene regulation is gene context specific.

Invention Description

The Penn State inventors have developed a simple, rapid luminescent cell-based assay that can determine whether a chemical can repress transcription of the Niemann-Pick C1-like 1 gene by activating the AHR. This assay can allow for the identification of ligands capable of repressing T cell differentiation to Th17 cells as well as repressing inflammatory acute-phase response in the liver. Experimental results using a known cholesterol lowering drug showed a four-fold increase in fluorescent activity relative to a control treatment, while a known AHR agonist largely blocked this induction. These results demonstrate the utility of this assay for screening potential AHR ligands with selective activity and possible therapeutic potential.

Future Developments

The researcher continues to investigate this invention in order to further optimize performance with funding from the National Institutes of Health and the USDA. The human cell line utilized in this assay may be transferred under a fee-bearing Materials Bailment Agreement.