**Project Phase 1 – Group 7**

Accession Number: GSE181851

Number of samples: 12

Experiment Type: Expression profiling by high throughput sequencing

Platform: GPL 24676 Illumina NovaSeq 6000

The overall aim of the study by Yanh H *et al*., was to perform transcriptomic analysis of RNA-seq data to understand the inflammatory activity of the *Petiveria alliacea* ethanol extract (PW) on macrophages in the presence and absence of Lipopolysaccharide (LPS). They used THP-1 derived macrophages from *Homo sapiens* and treated them with LPS. Since LPS is present in the outer membrane of most Gram-negative bacteria, it can be recognized as a foreign body by the cells and can stimulate the innate immune system. This stimulation mediates an inflammatory response [1,2]. From previous studies, PW is known to exert anti-inflammatory activities on some cells [3]. Thus, they used PW to investigate if it can reduce the inflammation produced by LPS in macrophages.

The dataset has 12 different samples- unstimulated macrophages, LPS treated macrophages, LPS-PW treated macrophages and PW treated macrophages (three replicates each). Out of the 12 samples in the dataset, we will be working on unstimulated cells, cells treated with LPS, and cells treated with LPS+PW. For our RNA-seq analysis we will be comparing the gene expression of LPS treated cells against the unstimulated cells to determine inflammatory response genes. We will then make a second comparison of gene expression of LPS+PW treated cells against LPS treated cells to find out if PW treatment in fact causes an anti-inflammatory response.

Citations:

1. Halder, S. K. et al. Retinal cell type-specific prevention of ischemia-induced damages by LPS-TLR4 signaling through microglia. *J. Neurochem.* **126**, 243–260 (2013).
2. Tremblay, S. et al. Systemic inflammation perturbs developmental retinal angiogenesis and neuroretinal function. *Invest. Ophthalmol. Vis. Sci.* **54**, 8125–8139 (2013).
3. Gutierrez RMP, Hoyo-Vadillo C. Anti-inflammatory Potential of *Petiveria alliacea* on Activated RAW264.7 Murine Macrophages. Pharmacogn Mag. (2017)