IENGAGE 2023

QUEEN'S UNIVERSITY BELFAST

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جامعة محمد بن راشد للطب و العلوم الصحية
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QUEEN'S UNIVERSITY BELFAST

WHAT IS IENGAGE?

iENGAGE is an online research program offered by the Wellcome-Wolfson Institute at Queen's University Belfast. Over the course of 6 weeks, we attended seminars, workshops, Journal Club and weekly supervised meetings to work on a research project of our choice. The course covered material in 3 main areas:

1. **Immunology and Microbes**
2. **Vision and Vascular Medicine**
3. **Respiratory Medicine**

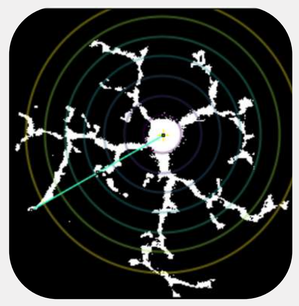
OBJECTIVES

- Provide remote interactions with WWIEM researchers, designed to **develop scientific skills**
- Offer high-level **insight and experience** into world-class research
- Deliver remote technical training in a range of **cutting-edge experimental techniques**
- Expand summer educational activities to **worldwide participation**

DIABETES EFFECTS ON RETINAL MICROGLIA

By Sara AlMaleki, Supervised by Dr Elani Beli

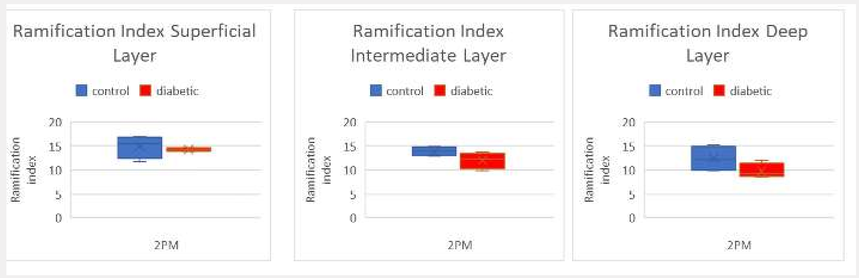
Obj. To determine if the ramification index of microglia is different in diabetic mice compared to the control at different times of the daily cycle.



We used constant conditions (DD) to uncover the effects of diabetes on the endogenous circadian rhythms and LD conditions to uncover if these changes are only regulated by light.

We started off by isolating the microglia from 4 replicated from each retina. then we used the z stack to separate the 3 different layers and preformed a sholl analysis to obtain the ramification index. Then to measure if the results were significant or not we preformed a T-test to compare between diabetic and control mice.

The data presented show the ramification index tends to be lower in diabetic mice compared to control, which means that diabetic microglia are more activated at 2pm Microglia in diabetes were more activated in the deeper layer of the retina.



ANGIOGENESIS AND AHR SIGNALING

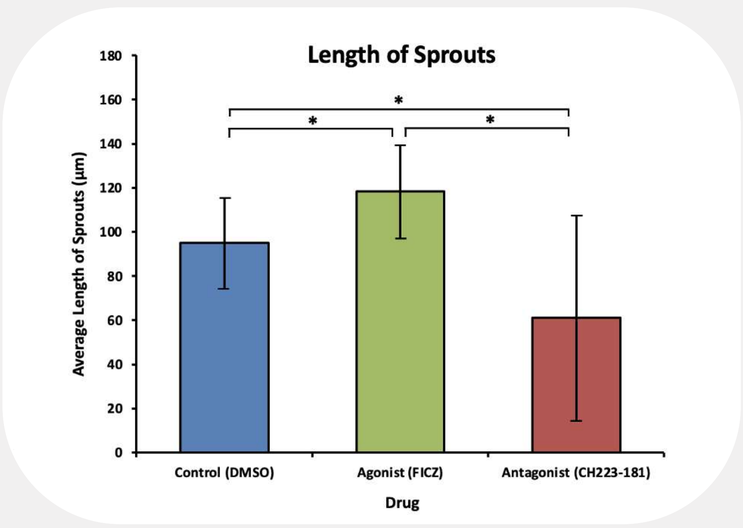
By Hagir Al-Dulaimi, Supervised by Dr Guilherme Costa

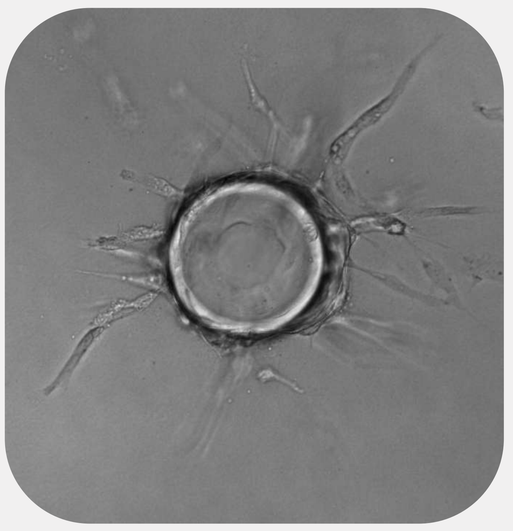
Our project focused on angiogenesis, and how AhR signalling pathways could potentially be targeted in the development of proangiogenic therapies, in the case of ischaemia, and antiangiogenic therapies for conditions such as cancer and diabetic retinopathy.

1. Firstly, we learnt about angiogenesis and its many known regulators such as VEGF. We identified that AhR was a potential yet not well-understood regulator of this process so this was the focus of our research.

2. Using qPCR to measure gene expression, we investigated the effect of three different drugs (DMSO, FICZ and CH223-181) on AhR. There was a statistical difference in gene expression ($p<0.05$)

3. Next, we compared the effect of these drugs on endothelial cells in an in vitro setting, using a Fibrin Bead Assay. We measured the length and number of sprouts on each bead, and as indicated by '*' on the graph, the drugs had a significant effect on angiogenesis





Fibrin Bead Assay