Fourth Quarterly Report to Noah's Pink Balloon Leukaemia Fund

The Noah's Pink Balloon Fellowship team (L to R, Prof. Adilia Warris, Dr. Alyssa Hudson, Dr. Dora Corzo-Leon and Dr. Liz Ballou).

University of Exeter
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UPDATE ON RESEARCH PROJECT FROM ALYSSA HUDSON

During this final stage of my project, I have been working with 11 different species of fungi that cause mucormycosis. I have been working with a monoclonal antibody that binds to a substance, or antigen, produced by these fungi. Using fluorescence microscopy we have sought to understand which of the fungi that cause mucormycosis produce this antigen and at what stage of fungal growth it is made. Excitingly, all 11 species stain brightly with the monoclonal antibody, confirming they all produce this antigen. Staining occurs as soon as the fungal spores swell and start to germinate, suggesting the antigen would be produced during early infection. The staining is brightest over the fungal hyphae, which is the part of the fungus that actively grows during infection. We have recorded videos of *Rhizopus arrhizus* (the most common causative species of mucormycosis) spores swelling, germinating and growing hyphae. We can see the antigen is produced by the fungus when it germinates and as the hyphae grow.

We have performed more detailed imaging of *Rhizopus arrhizus*, using a transmission electron microscope, to visualise the exact localisation of the antigen. This imaging has shown that the antigen is produced in abundance by the fungus and localises to the cell wall of the hyphae.

I have presented our work to the International Scientific Advisory board during their visit to the MRC Centre for Medical Mycology and at the British Society for Medical Mycology conference and we are now working towards publishing our data. It has been a fantastic end to an incredible year!

UPDATE FROM ALYSSA'S SUPERVISORS, PROFESSOR ADILIA WARRIS AND DR. LIZ BALLOU

It is just amazing what Alyssa has achieved during her fellowship, which is a reflection of her motivation, enthusiasm, and determination. During her research project, Alyssa has gained substantial practical skills in diagnostic assay development and significantly contributed to our understanding of the antigens of the Mucorales fungi being displayed during invasive fungal growth. She specifically studied the performance and behaviour of two antibodies uniquely designed to recognise different fungal antigens, which provided an understanding of the dynamics and amount of antigens displayed by the Mucorales fungi. Her work has established an infrastructure for diagnostic ELISAs (enzyme-linked immunosorbent assays) within our Centre and will serve as a strong platform for future work.

We would like to say a huge 'thank you' to Noah's Pink Balloon Leukaemia Fund, and to all your supporters. The opportunity you have created has been highly valuable to make a very much needed step to improve the diagnosis of mucormycosis and to train the next generation of medical mycologists at the bedside.