MPM-CAM: A collaborative project using a new hen's egg model to test potential personalised therapies for mesothelioma

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Using a hen's egg model to test how individual mesotheliomas respond to drug combinations

Pleural mesothelioma is a cancer of the lining of the lung, normally caused by asbestos that can develop decades after exposure. Although use of asbestos in the UK was abolished in 1999, the incidence of mesothelioma will remain high. Chemotherapy drugs and, more recently, drugs that target the immune system can benefit patients, but only some cancers respond. In most cases, the cancer eventually escapes control. There are several different genetic changes involved in mesothelioma that differ from patient to patient, which may influence how their individual cancer responds to treatments. In this research, we want to test a new targeted drug combination and explore why some patients might benefit from it more than others. We are developing a unique way of modelling individual response to treatment in the laboratory, using a fertilised hen's egg, as an alternative to laboratory mice. A tiny mesothelioma sample, from a diagnostic biopsy, is placed into the egg. The cancerous cells form a tumour nodule and grow within 10 to 14 days, supported by a blood supply from the egg. This allows us to test new and existing drugs against the mesothelioma cells. Mesothelioma patients' tumours have different genetic make-ups and respond differently to drugs. Anything within the human body that might indicate how the body will react to a treatment is called a biomarker. A biomarker gene called BAP1 is altered in half of all mesotheliomas. Our research, using cell lines grown on plastic, suggests BAP1 influences response to two existing drugs, which have shown promise in treating mesothelioma. Our aim now is to use the hen's egg model to test individual patient tumours' response which could help design better clinical trials by predicting mesotheliomas likely to respond.