Project Title: Comparing tumour suppressor activity of microRNA mimics in malignant pleural mesothelioma

Host School/Institute: Asbestos Disease Research Institute
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Project Type: Laboratory based

Project Category: Cancer, Molecular biology, Bioinformatics

Project Keywords:
1. mesothelioma
2. microRNA
3. translational research

Project Description:

Malignant Pleural Mesothelioma (MPM) is a cancer of the lining the thoracic cavity that is caused by asbestos exposure. MPM is an aggressive cancer with a median survival of only 12 months. Many patients receive chemotherapy, but even with the best available treatment (cisplatin and pemetrexed) survival is only increased by around 3 months and only 40% of patients respond. Thus, new approaches to therapy are needed.

At ADRI we have identified a number of downregulated microRNAs that are involved in MPM cell growth, and have shown that restoring their expression using mimics inhibits cell growth. This work forms the basis of our current phase I clinical trial of microRNA-based therapy in MPM patients. In addition to our work, additional microRNA mimics have been shown to have similar effects by other groups. The aim of this summer project is to compare growth inhibitory potential of a series of microRNA mimics in order to identify new candidates microRNA-based therapies. Towards this end, microRNA expression will be modulated using synthetic mimics, and the effects on cell proliferation, colony formation, migration and apoptosis will be investigated.

This project will give the student the opportunity to practice skills in molecular and cell biology, as well as bioinformatics. Specifically, the project will involve mammalian cell culture including transfection, nucleic acid isolation, RT-qPCR, apoptosis and cell cycle analysis, and pathway analysis.