Catherine Westbom

Regulation of NLRP3 in mesothelioma cells by chemotherapeutic drugs

Mesothelioma is a devastating tumor type with no effective therapeutic approach. Mesothelioma cells and tumors show reduced levels of the inflammasome NLRP3 and caspase-1 enzyme activity, which may be responsible for the drug resistance observed in this tumor type. Our project focuses on studying the effect of chemotherapeutic drugs on the NLRP3 system, so as to design more effective treatment options. Our results show that the chemotherapeutic drug Doxorubicin increases NLRP3 in 3 out of 4 mesothelioma cell lines studied, which may be accompanied by increased caspase-1 and IL-1β (a pro-inflammatory cytokine). In this case Doxorubicin with an IL-1β antagonist will be an effective strategy to investigate. This project is addressing an important health problem and will have a potential impact to improve therapy and advance our knowledge of mesothelioma through an understanding of its mechanisms. The work is innovative as we are the first to explore this pathway for drug design and will go from bench to bed side (clinical/translational).