

Project Title	Aiming for the Achilles' heel - discovering an effective drug against mesothelioma
Recipient	Dr Willem Lesterhuis
Institution	The University of Western Australia
Research description	<p>Mesothelioma is a fatal cancer caused by exposure to asbestos. Western Australia has the highest incidence of this cancer in the world, because of the mining, transport and high use of asbestos here. The outcome for people with mesothelioma has not improved in more than a decade. Mesothelioma starts in the lining of the lungs, but once it is diagnosed it often rapidly grows into surrounding organs such as the ribcage and heart. This causes severe shortness of breath and pain. The fast growth into surrounding organs makes it an 'invasive' cancer. It is not known why mesothelioma is so invasive.</p> <p>Mesothelioma is unique in that asbestos causes exactly the same tumours in humans and animals. The research team studies mesothelioma in mice, because mice can develop both invasive and non-invasive mesotheliomas. By comparing tumours from invasive and non-invasive mesotheliomas the team can address the question 'what makes mesothelioma such an invasive cancer?' In doing so, two related proteins have been identified that fuel the invasiveness and fast-growing behaviour of mesothelioma. These proteins are involved in the metabolism of sugar and fats, which is often abnormal in cancer cells. When these proteins are inhibited in mesothelioma cells from patients, the cancer cells died, while normal cells remained unharmed. This strongly suggests that these two proteins are not only very important in mesothelioma growth but that a drug that inhibits them could be very effective.</p> <p>In this project, the aim is to design drugs that specifically bind to these mesothelioma proteins, and thereby neutralize their activity. The interactions will be observed between the drug and proteins to create an optimal 'fit', and these variants will be tested against cancer cells from mesothelioma patients to identify the most effective drug. Using this approach, the aim is to develop a drug that is effective against mesothelioma, which can then be taken further into the clinic.</p>
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