Progress Report – September 2017

Name of Grant Recipient: **University of New South Wales**

Project Title: ***Therapeutically targeting a solute carrier transporter in the stroma of pancreatic cancer***

Principal Investigator: **A/Professor Phoebe Phillips**

Head, Pancreatic Cancer Translational Research Group

1. Summarise the aim of your research

We have seen very little improvement in pancreatic cancer (PC) patient survival in the last 30 years, and as a consequence eight Australians sadly lose their battle to PC every day and more than 3,000 new PC cases are diagnosed each year in Australia. It is shattering and unacceptable for PC patients that the best chemotherapy available only prolongs life by an average of 16 weeks. We have shown that PC cells recruit normal pancreas cells to support their growth and spread. Yet, these critical **'helper cells'**, known as pancreatic stellate cells (PSCs), have been ignored in current treatment strategies. PSCs produce an extensive scar tissue which makes up to 90% of the tumour, and increases tumour growth/chemo-resistance and blocks drug delivery to tumours. Our **aim** is to identify a therapy which shuts down the tumour-promoting activity of PSCs using a clinically relevant mouse model of pancreatic cancer.

2. What have the outcomes been to date?

Our novel work has uncovered a protein in pancreatic stellate cells (PSCs), which when inhibited decreases PSC growth and blocks their ability to **'feed'** pancreatic cancer cells key nutrients, which shuts down their tumour-promoting activity. We believe we have uncovered a novel way to inhibit PSC survival, decrease scar tissue, and inhibit tumour cells by shutting off their food supply from PSCs.

3. What are the next steps?

We have demonstrated that when we inhibit our target in pancreatic stellate cells (PSCs), we decrease their tumour-promoting activity in cells grown in a dish. These important findings have formed the foundation to test this target in a pre-clinical model of pancreatic cancer. We will use our **cutting-edge nanomedicine** or tiny drug delivery vehicles to deliver gene therapy to inhibit our target in PSCs in a clinically relevant mouse model of pancreatic cancer. Our nanomedicine overcomes the drug delivery barrier (scar) that exists with standard chemotherapies in pancreatic cancer. This study m ay develop new therapies for pancreatic cancer and improve efficacy of current chemotherapies, which may increase survival of pancreatic cancer patients.

4. What has it meant to receive funding from the Avner Pancreatic Cancer Foundation?

The generous support from the Avner Foundation was critical to support a highly novel project and provide essential seed funding to build evidence for a novel therapeutic target in pancreatic cancer. The important findings from this project will form the foundation of a high impact publication and will contribute to results that will help us achieve our goal of therapeutically tackling the 'helper cells' in pancreatic cancer. In the current government funding climate, highly innovative idea's require seed funding to generate supportive data. The Avner Foundation has helped build strong rationale for our project, which resulted in us attracting significant additional government support from Cancer Australia. Both grants will increase our chance to translate our laboratory finding to the clinic. This grant has also fostered my important collaboration with consumers (Gino Iori and Claire Harvey) involved in my research – a compulsory component to attracting government support for this project. In addition, the Avner Foundation support significantly strengthened my multi-disciplinary collaborations with chemical engineers and metabolism researchers. This grant has also retained significant expertise in my research group, via part funding an early career post-doctoral scientist Dr George Sharbeen (Co-chief Investigator on this grant) who has been performing some of the experiments. My successful Avner Foundation grants (2016 and 2017) significantly contributed to UNSW recognizing my research into pancreatic cancer and providing me a tenured track appointment (effective 1st July, 2017). This means that a researcher like me with >17 years experience in pancreatic cancer research can be retained in Australia and no longer have to rely on applying for fellowships. This will allow me to build workforce capacity to tackle pancreatic cancer, which is extremely important given that funding to this disease has fallen significantly short, relative to other cancers that pose a lesser burden on the community.