Inner Wheel Australia Foundation Trust Research Grant Applications 2022.

Panel Review.

The panel reviewed 6 applications for funding. From these 3 were recommended for funding.

All the applications were well written and provided detailed supporting scientific information from the literature and previous relevant research by the team.

The recommended grants aimed to develop an innovative use of cord blood cells. The successful applicants all demonstrated highly developed expertise in the relevant techniques and had performed developmental work to support their hypothesis. They had also a good track record in scientific research and had previously been funded by IWA. The panel also were pleased that in each case the lead investigator was an early career scientist supported by very experienced researchers.

There was also a clear indication that in each case there were clinical links which would ensure transition of successful projects to application in the clinic.

The panel considered it highly likely that each of these studies will yield meaningful results in the lifetime of the grant.

<u>Mapping the Immune defect in Type 1 Diabetes to the immune cells in Cord Blood.</u>

Dr Ying Wong, Dr Tim Sadlon and Prof Simon Barry. University of Adelaide.

Children of Type 1 diabetics (T1D) are at risk of developing diabetes. This project aims to study the genetics of immune cells in the cord blood of at risk children to identify any changes in immunosuppressive cells that could lead to diabetes. This would facilitate treatment or reversal of diabetes. This study is linked to a project funded by the Juvenile Diabetes Research Fund (JDRF) which has studied changes to immune cells of at risk infants and children.

This project was further supported for funding because the cord blood samples have been collected and are available for analysis, and this will form an important addition to a linked study. In addition, if successful, this approach has relevance for other diseases

<u>Development of a scalable 3D expansion system for UCB endothelial colony forming cells.</u>

Drs Ashalyn Watt and Dr Julie Sharp. Deakin University.

The treatment for chronic wounds seen in diabetics, obese individuals or older individuals who have impaired circulation due to diabetes or immobilisation due to physical disability requires reconstruction of blood vessels and recovery of blood flow. UCB-derived endothelial colony forming cells (ECFC) have been shown to promote wound healing by stimulating existing blood vessels, providing growth factor support and promoting development of new blood vessels. However further developments have been hindered due to cell numbers required to be therapeutic in an adult.

This project aims to develop methods for the reproducible expansion of ECFC from cord blood in numbers sufficient for therapeutic use. This would lead to an off the shelf treatment for healing chronic wounds.

This project was further supported for funding because, if successful, this would provide an effective treatment for chronic wounds which occur frequently in diabetics, the disabled and the elderly.

Expanded umbilical cord blood cells as a novel therapy for preterm brain injury.

Dr Tayla Penny, Prof Suzanne Miller and Dr Courtney McDonald. The Ritchie Centre, Hudson Institute of Medical Research Monash Childrens Hospital.

Preterm babies are at a high risk of poor neurological outcomes and developing lifelong disabilities, including cerebral palsy. It is postulated that early administration of UCB cells will improve multiple markers of preterm brain injury. This group has previously demonstrated that umbilical cord blood (UCB) stem cells reduce brain injury in sheep models of preterm birth. However, taking it to the clinic is hindered by the limited number of cells that can be obtained from a single UCB unit, and limited access to banked cord blood samples for allogeneic treatment. They have recently developed a potential 'off the shelf' expanded UCB (exUCB) product - with significantly increased numbers of UCB cells - that they believe will be effective at reducing preterm brain injury in vulnerable neonates. This project aims to test the effectiveness of this expanded UCB cell product in an animal model of preterm brain injury. It is hoped that this research will lead to a world first treatment, using 'off the shelf' expanded UCB cells in extremely preterm babies, delivered soon after birth to prevent cerebral palsy and its consequences.

This project was further supported for funding because the team have already successfully applied this treatment in another neurological disease. If successful, this would provide an effective treatment to reduce brain injury and prevent cerebral palsy and its consequences in preterm babies