Each month ACN asks a team member to provide a profile of themself that takes us behind the scene on what are the influences that encouraged their career choices.

March 2012

Q&A with Joshua McCarroll

Joshua first joined the Children’s Cancer Institute Australia for Medical Research (CCIA) in 2007. He completed his PhD in 2005 at the University of New South Wales (UNSW) with Professor Apte and the Pancreatic Research Group. His PhD studies involved identifying the signalling pathways involved in regulating pancreatic fibrosis. He then travelled to the USA to complete his postdoctoral studies at the University of Massachusetts Medical School in Professor Rana’s laboratory who is a world expert in RNA interference as well as in vivo siRNA delivery. During this time Joshua was able to use novel non-viral nanoparticles to complex and deliver clinically relevant amounts of siRNA to silence key genes involved in regulating cholesterol metabolism. Collectively, these studies resulted in 4 peer-reviewed publications. Upon completion of his postdoctoral studies, Joshua was awarded the Dean’s postdoctoral fellowship by the UNSW Faculty of Medicine and commenced his work at CCIA with Professor Kavallaris.

Joshua is an original member of the Australian Centre for NanoMedicine which commenced in 2011. His current research focuses on identifying genes that are involved in promoting chemotherapy drug resistance in several types of cancers including, lung, brain, pancreatic and childhood neuroblastoma. Once identified, these genes are then targeted with non-viral nanoparticles that possess the ability to complex and deliver siRNA to silence their expression in clinically relevant animal models of cancer. It is hoped that these studies will eventually be translated into the clinic and significantly increase sensitivity of these otherwise drug refractory tumours to chemotherapy. Joshua has successfully obtained research funding from the National Health and Medical Research Council, Cancer Institute NSW, Cancer Council NSW, Cure Cancer Australia Foundation and the Bahnaves Foundation. His recent achievements include, Cancer Institute NSW Early Career Development fellowship, Faculty of Medicine, UNSW ‘Deans Rising Star Award’ as well as being chosen by the Faculty of Medicine at the UNSW as one of ten top young researchers to represent UNSW at the NHMRC 75th Anniversary Symposium. He is a project leader at CCIA and currently supervises 3 research assistants and 2 PhD students.

What was your inspiration in becoming a cancer biologist?

My motivation for cancer research is very personal, as a young child I was diagnosed with cancer and had 2 years of chemotherapy and radiation. The treatment back then was very harsh. Therefore, I hope that my research can help cancer patients i) by making drug resistant tumours more susceptible to our current chemotherapy agents by silencing key genes involved in promoting resistance and ii) helping
to reduce the toxic side effects of chemotherapy by using targeted nanoparticles to deliver chemotherapy directly to the tumour cells while avoiding the normal cells of the body.

**What inspires you about ACN?**
It is exciting to be involved with the Australian Centre for NanoMedicine as it allows internationally recognised biologists and chemists to work closely together to help translate bench top research into clinical treatments for a wide range of human disease.