Cancer Council Western Australia
PhD Top Up Scholarship

Cancer Council WA

Project title	Improving tumour detection using multimodality imaging
Recipient	Ms Meenu Chopra
Institution	Harry Perkins Institute of Medical Research
Research description	Cancer spread in our body is difficult to detect. Diagnostic imaging to detect cancers in patients often involves injection of non-specific dyes or probes that bind to both normal and cancerous tissues. In addition, injection of imaging probes at high dose can also cause systemic toxicity. This project addresses these limitations, by developing cancer targeted small molecules that specifically bind and accumulate in cancerous tissues and can be detected by non-invasive imaging instruments including magnetic resonance imaging (MRI), positron emission tomography (PET) and near infrared imagery. Breast Cancer is a common cancer in Australia and the second leading cause of cancer-related death in Australian women, accounting for 15.6 per cent of all cancer deaths in women, in 2011. Liver cancer is third leading cause of cancer death after lung and stomach cancers. Liver cancer can occur as a primary or secondary cancer from different organ that spreads to the liver. Early diagnosis of liver cancer is difficult because signs and symptoms often do not appear until the cancer is already advanced. Once liver cancer has metastasised, they are usually fatal within 6 to 12 months of diagnosis. Recent statistics indicate that the incidence of primary liver cancer is increasing and the relative survival rate is below 20%. It is important that both breast and liver cancers are detected early. Effective imaging-guided localisation of metastasised cancers can also potentially aid surgical procedures to remove the malignancies. A/Prof. Juliana Hamzah's laboratory has identified several tumour specific probes that bind breast and liver cancers. If injected through the blood circulation, they can find and specifically accumulate in tumours. These tumour-homing probes will be used to deliver nano-size molecules (i.e. nanoparticles) that can be track down non-invasively. If these nanoparticles are specifically targeted to tumours, they will enhance the detection of both early and metastatic tumours. If successful, the outcomes of this project can potentially create new cancer imaging reagents that will be useful for cancer diagnosis.
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