Helping to shed light on schizophrenia

SCHIZOPHRENIA has always intrigued Mr Renick Lee – and this has led him to take on a final year project with the Singapore Institute for Neurotechnology (SINAPSE) which is just slightly more than a year old. The project marks the Institute’s first probe into this severe neuropsychiatric disorder.

The project has also won Renick a Merit Award at the Faculty of Engineering’s 27th Innovation and Research Award. Graduating in July 2013 with a B Eng in Bioengineering (Honours), Renick is considering his option of continuing research with SINAPSE – he is extremely drawn towards the multi-disciplinary nature of the work pursued at the Institute.
Said one of his supervisors at SINAPSE, Dr Yu Sun, “He shows a rare commitment and dedication to the research, something which we don’t usually see in undergraduates at this juncture of their development.”

Renick was also one of the authors of a conference paper entitled “Structural connectivity analysis reveals topological aberrations in patients with schizophrenia” to be presented at the 35th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC ’13) which will be held in Osaka, Japan from 3-7 July 2013.

Partly motivating Renick into this research in schizophrenia was also the fact that he has a few close friends who were stricken with psychiatric disorders.

Said Renick, “I do hope this research can lead to a better understanding of the illness which will eventually benefit patients with these illnesses in the longer run.”

Schizophrenia is a chronic and disabling major psychotic disorder. People with the disorder may have abnormal and troubling experiences such as hearing voices which others do not hear, fearing that people are plotting against them or talking about them, or that they can read their minds, control their thoughts, emotions or actions. It is often accompanied by significant social and occupational dysfunction and can affect the quality of life of the sufferers and caregivers.

Treatment is mainly through medications and non-medication strategies. Similar to many other psychiatric disorders such as depression and anxiety, the neural basis of the disease is far from fully understood. Researchers around the world are trying to come up with more effective medications as well as new research tools to better understand the causes of this disorder.

What scientists do know is that the disease runs in families. According to the US Institute of Mental Health, the illness occurs in one per cent of the general population, but occurs in 10 per cent of people who have a first degree relative with the disorder, such as a parent, brother or sister. It is believed that interactions between genes and the environment are important contributory factors for schizophrenia. Recent research has also found that people with schizophrenia tend to have higher rates of rare genetic mutations leading to disruptions in brain development.

Renick’s final-year project done in collaboration with SINAPSE and the Institute of Mental Health, hopes to shed more light onto what actually happens in the brains of patients suffering from schizophrenia, using structural neuroimaging methods. This includes structural MRI and diffusion tensor imaging which allows examination of macro and microstructural white matter integrity of brain structures.

Comparing patients and controls using these imaging modalities, their preliminary data revealed that patients show some compromises in the brain networks examined.

“This finding if validated may constitute a potential biomarker for further study of the progress of this illness and inform thinking about future novel therapies,” said Associate Professor Sim Kang who is also a senior consultant psychiatrist at the Institute of Mental Health.