Cancer Council Western Australia
PhD Top Up Scholarship

Cancer Council WA

| Project title | Expression and function of stem cell genes in aggressive human brain tumours |
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| Recipient | Ms Tracy Seymour |
| Institution | The University of Western Australia |
| Research description | Glioblastoma is the most common type of primary brain tumour, with 1,000 new cases per year in Australia and a low average survival time of only 12 to 15 months. Glioblastoma is very aggressive and has the ability to transform into its more aggressive variant, gliosarcoma, for which very little is currently known. Current clinical treatments for both glioblastoma and gliosarcoma are the same, despite clinical indications suggesting that they are different diseases.<br><br>Previous research has shown that glioblastoma and gliosarcoma tumours contain a type of cell known as glioma stem cells. Stem cells are the precursors of all other cells in the body. Stem cells are special because they are regenerative (they can replicate themselves) and malleable (they can turn into different types of specialised cells). Glioma stem cells are very aggressive and help glioblastoma and gliosarcoma tumours to grow. Unfortunately, glioma stem cells are not destroyed by current clinical treatments and this enables the cancer to return once treatment has finished. Certain genes, such as SOX2, OCT4 and NANOG, show abnormal functioning in glioma stem cells, when compared with how these genes function in other healthy stem cells. The abnormal functioning of these genes may cause the aggressive characteristics of glioma stem cells.<br><br>This research aims to explore how SOX2, OCT4 and NANOG function in glioblastoma and gliosarcoma, with focus on SOX2 and on shedding light into the properties of gliosarcoma for which so little is known. This will provide the basis for use of these genes as novel therapeutic targets. The research will also use a new technology that targets SOX2 to interfere and stop its function. Lastly, the research will explore the effects of current treatments on glioma stem cells in order to determine mechanisms that enable tumours to return after treatment. |
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