

<b>Academic unit</b>	Centre for Cancer Biology
<b>Project title:</b>	Flow cytometry-based bio-tools and water quality monitoring
<p><b>Project summary:</b></p> <p>Flow cytometry is a powerful platform that collects fluorescence data from thousands of individual cells per second. Cells travel in a fluidic stream through a flow cell, where lasers excite any fluorophores in the cell. Scientists can make a cell fluoresce by fluorescently-staining cellular proteins or structures. The cytometer records the fluorescence profile of each cell, which provides a powerful overview of the cell populations within for a given sample.</p> <p>There are two projects on offer in the flow cytometry lab: fluorescent protein bio-tool generation or water quality monitoring.</p> <p>Establish fluorescent protein systems:</p> <ul style="list-style-type: none"> <li>• FRET (<i>fluorescence</i> resonance energy transfer) assay to detect molecular interactions and cellular location.</li> <li>• Cell telemetry: make cells fluoresce during certain situations (cell proliferation, cell death, cell metabolism, cell stress).</li> <li>• Analyse RNA by flow cytometry using RNA-aptamers.</li> <li>• Colour competition assay. Use fluorescence to track different cell types in a complex mixture.</li> </ul> <p>Water quality (bacteria) is routinely monitored using solid agar medium. The advantages for using flow cytometry are a &gt;1000x increase in sensitivity, analysis performed in a single tube and you can collect cells of interest for downstream study. In addition to bacteria in the water supply, flow cytometry can also be used to detect viruses and microplastics. This project will aim to establish a protocol for monitoring water supplies from site-collection to flow analysis. For example, monitoring samples from the River Torrens, and rain-water tanks. As well as examining the effectiveness of water purification devices.</p>	
<b>Alignment with uniSA priorities</b>	Cancer theme
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