

UROP STUDENTS: PROJECT EXAMPLES

My project was an unusual one - I was an embedded software engineer in a Cancer Lab, producing prototype software to help store and process the data generated by the ENU experiments. I would recommend this project or similar to any Software Engineering/Computer Science student as the subject 433-341 Software Engineering Principles and Practice offered in Melbourne Uni anticipated many of the issues that arose. When working on one single programming project in a new language, I would estimate that it would take about three months to learn the language, and another three months to produce a really polished software project. While it is true that useable fragments and rough prototypes could be put together in the first couple of weeks, due to the support that Perl and R's prebuilt libraries provide, but these prototype programs tend to need to be extended and properly documented before they can be handed over at the end of the project.

My project was to find out the biological role of IFI16, which has been hypothesized to be involved in DNA repair. Fluorescence microscopy showed IFI16 localized in foci or blobs in cells. Percentage of cells with foci increased with irradiation or DNA damaging agents. Western blot in time course experiments showed no IFI16 degradation, as other groups have indicated. After cell cycle analysis, foci formation is thought to be connected to the G1 phase.

Later, telomerase (htert) was found to co-localize with IFI16 in fluorescence microscopy. We now hypothesize that IFI16 interacts with htert during G1 of cell cycle.

I am involved in a project investigating the importance of individual binding residues of Bim protein for the Bim - Bcl-2 like protein interactions. I am currently involved in cloning some Bim mutant retroviral constructs to test invitro.



During the past 6 months, I helped to make LIMK1 mutation constructs to identify important phosphorylation sites. Using a PCR method we mutated a few serine residues to alanine. Then we did an in vitro kinase assay to test the phosphorylation state of these mutants.

My project involved doing a microarray analysis comparing gene expression pattern between mice infected with Plasmodium berghei (murine malaria) who either were knockouts for a critical component (MyD88) of the signalling pathway (TLRs) or were heterozygous for it. The end result was an attempt to further understand the pathology of a malarial infection by finding the root cause of the symptoms through differences in the gene expression patterns. I was able to not only work with mice but also work at a micro gram level in preparing the microarray chips so I really valued the chance to follow the disease process from symptoms to genetics.

In terms of project, my work involved a blend of molecular techniques and developmental biology in the context of the zebrafish model system. My primary goal was to construct plasmids, which upon microinjection would cause a leukaemia phenotype in zebrafish. The project was well thought out and had high relevance to a major disease which causes a lot of suffering, which is the interest I expressed in my application for UROP. Aside from the tremendous advantage of real-life research experience that UROP can offer, I found it also helped me focus on my university studies by facilitating the integration of several disciplines of biomedical research into the "bigger picture" of improving the quality of life of affected patients