

Exploration of the T-cell Differentiation Landscape in Soft Tissue Sarcoma Using a Transcriptional Signature - Julia Bylinska



I had the pleasure to undertake my studentship in the Sarcoma Biology and Genomics Lab from the 24th of March to the 27 of June 2021 under supervision of Nischalan Pillay and Shadi Hames. It was my second time working with the lab, as I originally applied for the Pathology Society Summer Studentship in 2020, but my project was postponed. I undertook a remote project on digital pathology last year, which I described in the previous report. This year I worked on gene expression analysis of sarcoma tumours using computational methods in R studio. As my interest in genomics of cancer and computational biology were main reasons I chose to work with this lab, this year's project was particularly interesting to me.

My project was computational and required me to learn a lot of new skills, which were different from what I gained from my previous wet lab experiences. Even though I started studying the basics of R before my project began, I spent a lot of time during the project learning how to perform more advanced analysis, including Count-Based Differential Expression Analysis of RNA-seq and Gene Set Enrichment Analysis (GSEA). I think that computational projects require two separate skills – understanding how a particular analysis works and why are we applying it to a dataset as well as practically implementing the code to run an analysis. It is surprisingly a lot to comprehend in the span of 5 weeks. I would suggest to any future student willing to undertake a computational project to learn the basics of the programming language and ask for background readings on computational methods before the project begins to make the most out of their studentship.

Even though this project was challenging, I got help from my supervisors on every step of the way. The aim of my research evolved more and more as my project progressed. Only the very last analysis I performed was chosen to be presented at the Pathology Society Winter meeting. I realized that behind the scenes in science there is a lot more work than what is published as the final product. Asking the right questions guides the analysis in science, but often it is not obvious which questions to ask. Being inquisitive can also be a skill and I think I got better at it at the end of the studentship.

My project involved replicating a survival-analysis from a paper published in Nature, as the database used in the study was corrected. In my project I managed to produce evidence contradictory to this paper, which made me realize that errors in research will inevitably occur and overreliance on one piece of evidence can be misleading.

Overall, the studentship equipped me with many useful skills, from performing many computational analyses to understanding and implementing the scientific method. I am using those skills today in my iBSc project. The insight into research I got through the studentship guided my decision to apply to the MBPhD programme and will be very useful in my future scientific career.