

# BDIAP Fellowship Report

Name of bursary recipient: Dr Kate Dinneen

Year bursary awarded: 2020

Trust where employed: South Dublin, Ireland

Trainee grade: Specialist registrar

Department where the research was carried out: Sir Patrick Dun Laboratory, Trinity College Dublin

Gastroesophageal junction adenocarcinomas (GEJA) have increased in incidence in the Western world over the last 50 years, a trend largely attributed to lifestyle factors including obesity and gastroesophageal reflux disease. Their prognosis is poor, and treatment is often complicated by resistance to conventional anti-cancer therapies. Current drug therapies and management strategies used in GEJA have been largely inferred from studies looking at gastric and oesophageal adenocarcinomas, however, a growing school of thought exists which believes that GEJAs have a distinct molecular profile. Investigation of the molecular biology of these tumours may therefore provide us with a novel target for drug therapies, in addition to potential prognostic biomarkers for use in the clinical setting. Cancer stem cells (CSC) have been extensively investigated across a range of solid organ and haematological malignancies due to their known role in tumorigenesis, invasion, metastasis and drug resistance, yet little is known about their role in GEJA. This project investigated the presence of CSC-like cells in GEJA by analysis of the expression patterns of mRNAs, miRNAs and proteins which have previously been described as CSC markers. Molecular markers of EMT were additionally investigated using the same techniques due to the known role of EMT in the regulation of CSCs. This expression data was analysed to seek a significant molecular expression pattern that may be of use in identification, prognostication and/or treatment of aggressive disease.

The project was chosen and designed by myself and my supervisors Prof Orla Sheils and Dr Ciara Ryan. I have an interest in gastrointestinal pathology, and my supervisors are specialists in molecular and gastrointestinal pathology respectively, thus the project was designed to incorporate both specialist areas. The project was approximately 50/50 histology and molecular, the former involving both H&E and IHC interpretation, and the latter involving PCR analysis of mRNA and miRNAs. The results were as expected: we identified a number of expression patterns associated with EMT and stemness which correlated with both histological tumour appearances and clinical outcomes.

I carried out all of the lab work in the project, performed the statistical analysis of the data with the help of a statistician in TCD, wrote the thesis and presented the findings. To date, one paper has been accepted for publication from this work, and a second is still in progress. I have presented the completed project at three conferences: RCPI Annual Pathology Symposium 2020, ESP-IAP 2020 and the Irish Society of Surgical Pathology. From the latter conference I won the gold medal registrars prize for my oral presentation. I also completed a Doctor in Clinical Medicine in Trinity College Dublin, for which I was conferred (online!) in November 2020. Fortunately, COVID-19 did not affect my research. In fact, I submitted my thesis on March 12<sup>th</sup> 2020 – the day that universities were closed by the government in Ireland!

I enjoyed my experience of immersion in histopathology related research. I learned a lot about different lab techniques, critical appraisal of scientific papers and statistical analysis. I also became aware of a number of limitations to lab-based research which I had not previously been aware – I believe that this knowledge will stand to me in both the clinical and research settings going forward in my career.

I very much enjoyed the IAP-ESP virtual meeting and felt that it was an impressive production in light of current limitations. As a trainee it was wonderful to be able to attend a wide variety of talks at simply the click of a button. The poster presentation went without issue – certainly not having to print and put up a poster in person makes life easier! Once again, the format for the poster session was well designed and easy to navigate.

I would like to thank the BDIAP for their support for this project, and indeed for their continued support throughout the years of my training to date.



ISSP gold medal