

ESOT Transplant Fellowship – Final detailed report

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Since commencing my research residency in June 2023, supported by the ESOT Transplant Fellowship, I have embarked on a transformative journey at the Centre for Regenerative Medicine at the University of Edinburgh, UK.

From a personal perspective, this fellowship has been an incredible opportunity to grow and challenge myself in new ways. I have gained invaluable insights into the world of academic research, deepening my understanding of regenerative medicine and its potential to revolutionize transplantation.

Professionally, the fellowship has significantly expanded my academic horizons, providing the essential support and mentorship needed to thrive in a highly competitive research environment. Under the guidance of my dedicated supervisors, Dr. Sofia Ferreira-Gonzalez and Prof. Stuart Forbes, I have developed valuable preliminary data that was crucial during my PhD interviews. The skills and insights I gained during this fellowship directly contributed to my success in securing a highly competitive, fully funded PhD scholarship in Regenerative Medicine at the University of Edinburgh. My PhD research, set to begin in October 2024, will focus on assessing senescence and reconditioning discarded human donor livers using machine perfusion.

Over the past year, my research has primarily focused on investigating biliary complications (BC) post-liver transplantation using an assessment tool developed by Dr. Sofia Gonzalez and her team, named Sensibile. This tool aims to predict the likelihood of biliary complications in potential liver grafts, providing surgeons with critical insights before transplantation. We have worked on optimizing the application system to ensure the proper flow of bile within the tool, utilizing 3D printing technology. Additionally, we have tested human bile samples to refine this point-of-care test, with the goal of enabling earlier recognition and treatment of BC.

The ESOT Transplant Fellowship seamlessly integrated clinical practice with fundamental research, equipping me with proven methodologies and essential tools for a successful PhD journey. During my tenure, I have acquired a diverse skill set, including proficiency in tissue culture techniques, extensive work with 3D organoids and 2D cell cultures, and expertise in

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histology, microscopy, biochemical assays, and PCR for real-time assessment of perfused livers.

Another significant achievement during this fellowship has been establishing a fruitful collaboration with the Luc van der Laan group in Rotterdam, focusing on the study of Primary Sclerosing Cholangitis (PSC) organoids. My work has centered on characterizing PSC livers in comparison to healthy liver grafts. The investigation into the role of senescence in PSC livers is of paramount importance, given the limited curative options for PSC patients. A significant challenge in liver transplantation, particularly for young recipients, is the high recurrence rate of PSC. Our preliminary data indicate that cellular senescence is a key feature of this disease. Currently, we are preparing to send these samples for single-cell sequencing, with the long-term goal of exploring how senolytic drugs interact with PSC grafts during normothermic machine perfusion (NMP). Additionally, we aim to understand how senescent cells interact with macrophages, potentially testing combined novel cell therapies.

In conclusion, this fellowship has been a defining chapter in my professional journey. The knowledge and skills I've acquired form a robust foundation for my future research, and the support from the ESOT Transplant Fellowship has been instrumental in achieving my goals. I am deeply grateful for the invaluable support and resources provided by both the Innsbruck Transplantation Center and the Centre for Regenerative Medicine.