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Crossing borders in regenerative medicine

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Crossing borders in regenerative medicine

Looking past national and disciplinary boundaries to contribute to the future of medicine

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Background

A life-changing event occurred to me in November 2009 as I received an email from Prof Masayuki Yamato approving my request to join his research group for twenty weeks. I was in the third year of medical studies and was looking for options to perform a mandatory scientific project. At the time I was eager to start working clinically and treat patients, I couldn't see myself working as a researcher. However, these feelings would change soon after joining Prof Yamato's group.

In the end of summer 2010 I travelled for my first time to Japan. It was an exciting experience, I didn't know what to expect and I couldn't understand a single word of Japanese. Luckily, I was very well received at the host institute, Tokyo Women's Medical University - Waseda University joint Institution for Advanced Biomedical Sciences (TWIns). One of my earliest memories is an inquiry from Prof Yamato asking if I was interested to help with a book chapter on cell sheet engineering. I initially thought it was a matter of proof reading, but I soon realized the task was much more extensive as I was given a USB-stick with hundreds of scientific

articles which were to be summarized. It was a tough task but it gave me a strong motivation to study the research field and resulted in a book chapter that was published in 2011 (Tissue Engineering in Regenerative Medicine, 2011). My internship in Tokyo was very well planned and despite being only 20 weeks, I received training in many important areas including cell culture work (by Dr. Makoto Kondo), small animal work (by Dr. Ryo Takagi), large animal work (by Dr. Nobuo Kanai) and scientific writing (by Prof. Masayuki Yamato). I have countless unforgettable memories from both inside and outside the laboratory. During the stay, the current KI president (Harriet Wallberg-Henriksson) visited TWIns together with several delegates which led to a former collaboration agreement between the two universities.



2010 - Tokyo



2010 – KI(KI 200 anniversary year)

Towards the end of the internship I was determined – I wanted to proceed with PhD-studies in regenerative medicine. Around one year later I was registered as a doctoral student in regenerative medicine with part of my project involving assisting the transfer of cell sheet technology for esophageal application from Japan to Sweden. This transfer was a great joint effort by many individuals in both countries and involving Karolinska University Hospital, Karolinska Institutet, Vecura (GMP-facility), Swedish Medical Products Agency and the Stockholm Regional Ethics Board. The first patient to receive oral mucosal epithelial cell sheets for esophageal regeneration in Sweden was treated in 2012. I received leftover cell sheets which I investigated for histological architecture, extracellular matrix-composition, cell-to-cell junctions, pluripotency markers, viability and proliferation. In 2016 we published an article (Eduard et al, 2016) describing the first five Swedish patients, which also were the first patients receiving cell sheet therapy for esophagus outside of Japan.

In May of 2016 I met Dr Kanai at the “International Society for Cellular Therapy”-conference in Singapore and we discussed

possibilities for me to once again join TWIns for a research project. Several patients and healthy donor-derived oral mucosal epithelial cell sheets were planned in the near future, opening up many opportunities for interesting research projects. After support from key members from Karolinska (Prof Matthias Löhr, Prof Magnus Nilsson and Dr Nikkola) and Japan (Prof Teruo Okano, Prof Tatsuya Shimizu, Prof Mime Egami and Dr Nobuo Kanai) I could once again join TWIns in August 2016.

Current project

My current research at TWIns involves trying to understand the underlying mode-of-action of oral mucosal epithelial cell sheets. More specifically, I am investigating the paracrine effect of the cells and how they affect wound healing and scarring.

Final words

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