TCS/17/25 – Characterisation of the ovarian cancer stem cell niche - targeting stem cell biology to combat drug resistance

Ovarian cancer, the "silent killer" is the most lethal gynaecological malignancy. Many women are diagnosed with advanced disease, when surgery is not possible and combination chemotherapy with drugs called carboplatin and paclitaxel is the most appropriate treatment. Patients often initially respond well, but stop responding as their cancer cells adapt, to avoid being killed by toxic chemotherapy drugs. To better understand why this happens, we have created a unique translational study to compare cancer cells in ascitic fluid obtained from patients as they progress through treatment and become resistant to chemotherapy. Intriguingly, our data suggests that resistance results from chemotherapy-induced expansion of small numbers of inherently resistant, immortal "stem cells", with specialised survival properties which work together to promote drug resistance. Excitingly, if we can better understand these processes, we may be able to use highly specific novel combination treatment approaches to target and disable them, re-sensitising chemotherapy resistant cancers