

# Project Abstract

## **Immunomodulatory effects of Spheroids from Adipose-derived Stem Cells in vascularized composite allotransplantation: Donor-specific tolerance induction and in vivo tracking**

### **Abstract**

Vascularized composite allotransplantations (VCAs) are not routinely performed for tissue reconstruction because the potentially harmful adverse effects associated with lifelong administration of immunosuppressive agents. Consequently, researchers have been actively seeking alternative methods for establishing donor-specific tolerance while minimizing toxicity. Mesenchymal stem cells (MSCs), and in particular Adipose-derived Stem Cells (ASCs), have emerged as promising cell therapies for immunomodulation and are currently being tested in preclinical and clinical settings as therapies for transplant rejection. However, the biological mechanisms of ASCs by which this treatment modality exerts its therapeutic effects remain unclear. The recent isolation of Spheroids from Adipose-derived Stem Cells (SASCs) from adipose tissue has provided new perspectives on the biological and immunological potentials. Unlike of adherent ASCs, the immunomodulatory effect of SASCs have not been investigated yet. Therefore, in this research study we will compare the immunomodulatory properties of autologous SASCs and ASCs and analyze the microenvironmental molecules produced by these stem cells. Furthermore, we will examine the feasibility of tracking *in vivo* administered adherent and non-adherent ASCs in order to characterize their fate, destinations, kinetic behaviours and longevity and to assess how tolerance is induced and maintained in a NSG mouse VCA Hind-limb model.