PROJECT RESUME

Tendons attach to bone via a specialised interface - the enthesis. The enthesis has a key functional role in transmitting the force produced by muscle contraction though tendon to bone allowing movement to occur. One of the ways it does this is by gradually increasing the mineral content of the tendon tissue as it approaches bone, creating a smooth transition between the soft and hard tissues.

This project aims to replicate the enthesis in the laboratory using tissue-engineering techniques. An in vitro model of the enthesis will be manufactured using a tendon-cell-seeded hydrogel 'tendon' and a bespoke hydrogel 'bone'. Importantly, the bone hydrogel has been specifically manufactured to contain a gradient of mineral throughout, and therefore may replicate the native enthesis in vitro. We will assess integration of the 'bone' and tendon' components via histological imaging, to ascertain the potential for this technique to create an engineered enthesis.