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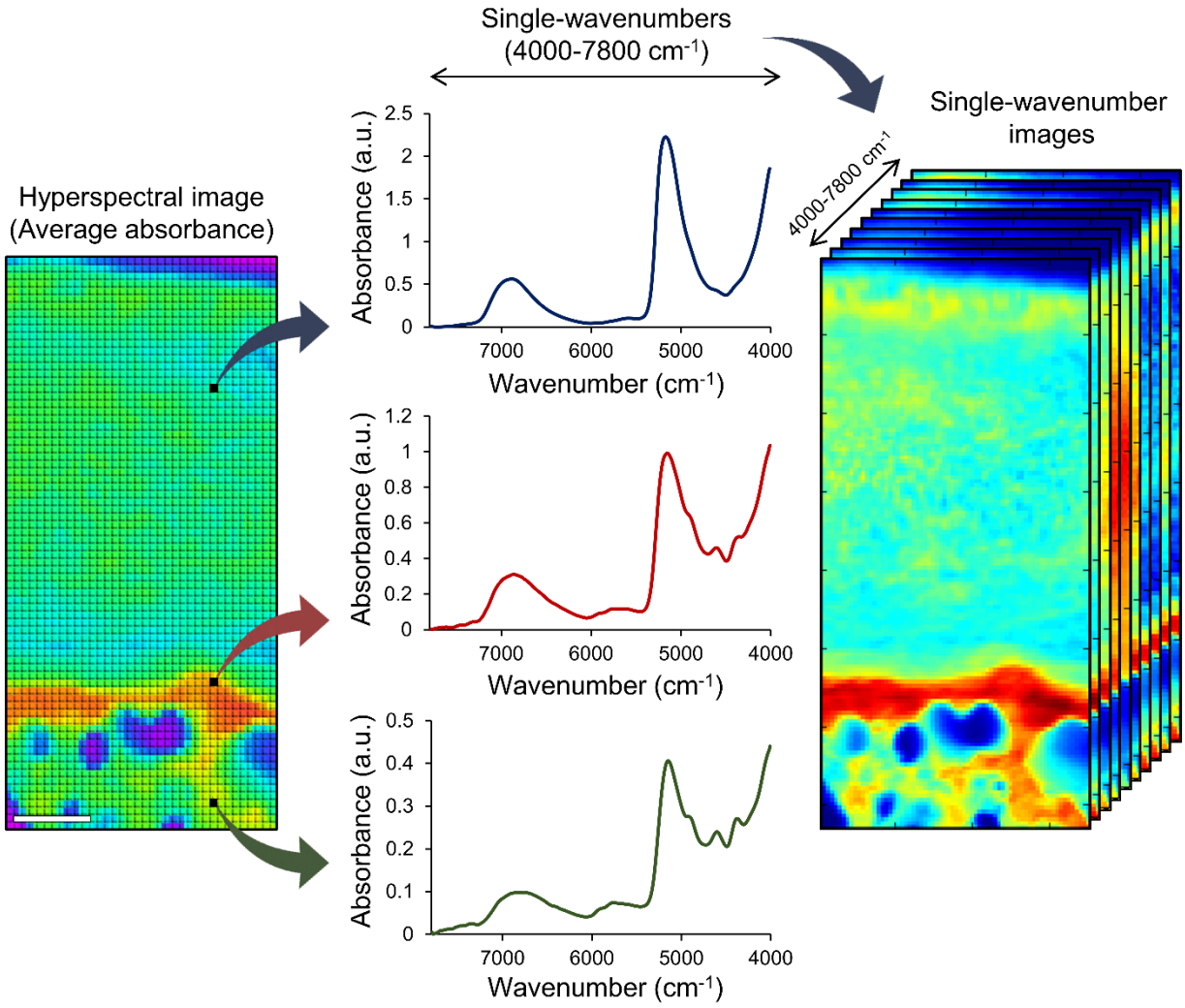
Supplementary information

Characterization of connective tissues using near-infrared spectroscopy and imaging

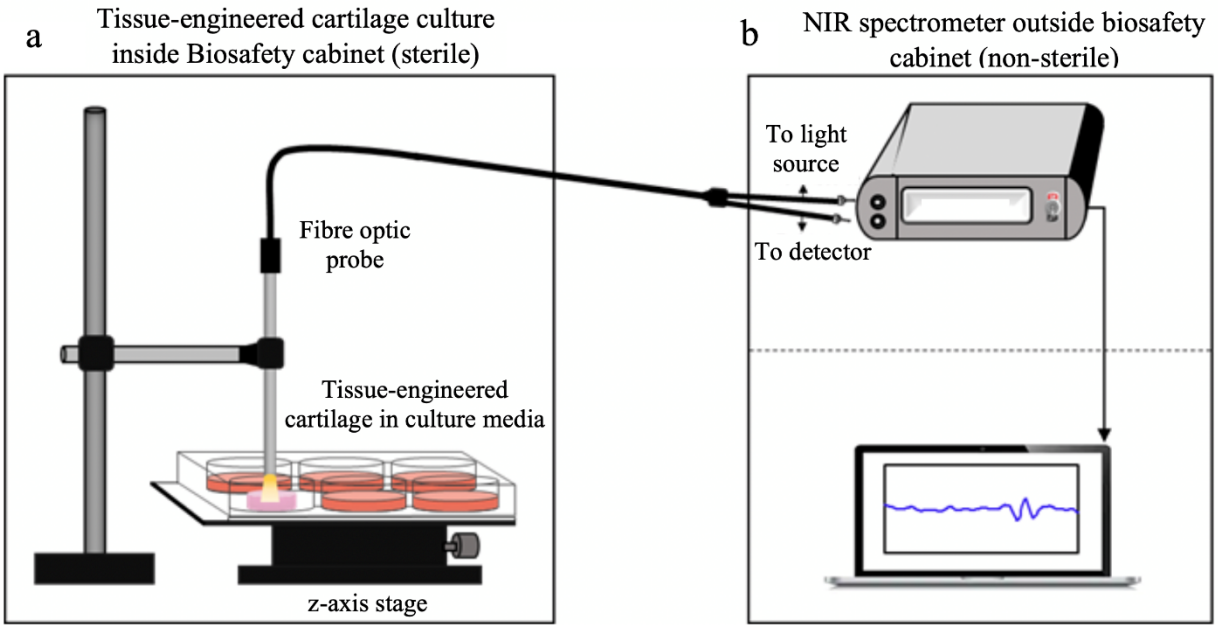
In the format provided by the authors and unedited

NIR spectral imaging of osteochondral (cartilage-on-bone) tissue



Supplementary Figure 1: NIR hyperspectral image. A single spectral image is formed by a collection of multiple linear arrays of spectra, collected at micron-scale spatial resolution (pixel size). Each pixel of the spectral image corresponds to an individual spectrum, which in turn is formed by multiple frequencies (wavenumbers). By selecting the frequency of an absorbance band associated to a specific component of interest (e.g. water, collagen), it is possible to obtain a single-wavenumber image that shows the intensity and distribution of the component throughout the sample. Multiple single-wavenumber images can be obtained from one hyperspectral image by selecting different bands of interest, characterizing this imaging approach as an information-rich resource to evaluate sample composition. Samples were obtained from a local abattoir; thus, no ethical permission was required. Scale bar: 500 µm.

Experimental set up of NIR spectroscopic assessment of tissue-engineered constructs



Supplementary Figure 2: Schematic of the experimental setup for the collection of spectra from tissue-engineered constructs. The fibre optic probe, z-axis stage and the probe stand are surface sterilized by 70% ethanol before putting them inside the biosafety cabinet (a). The NIR spectrometer and the laptop computer are placed outside the biosafety cabinet in a non-sterile environment. The fibre optic probe is connected to the spectrometer via SMA connectors on both the NIR source and detector side (b). Samples were obtained from a local abattoir; thus, no ethical permission was required.