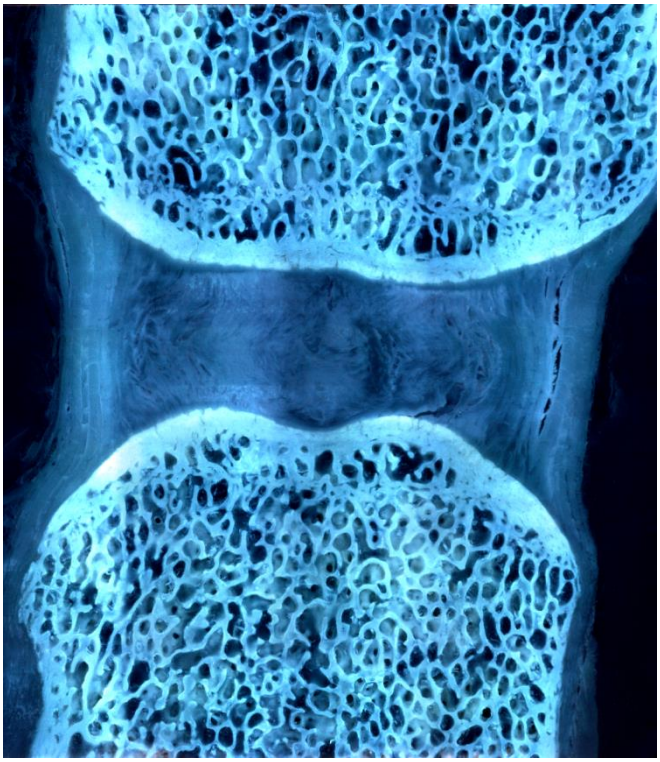

Figure 1.1. Representative images from the 3D serial milling dataset of a bovine tail intervertebral disc using fluorescent illumination (370nm). The lamellar layers of the disc are clearly visible, as is the detailed microstructure of the adjacent vertebral trabecular bone.

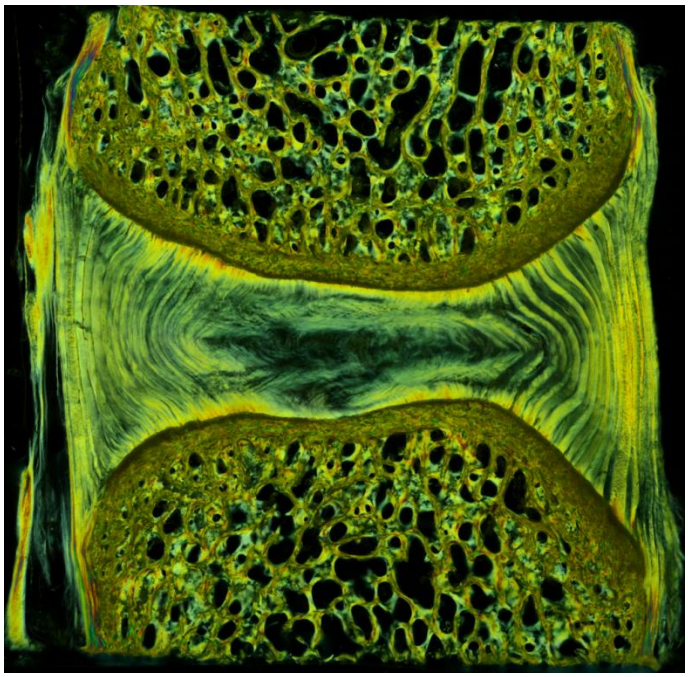

Figure 1.2. Example of a stitched reconstruction (700 images) of a sagittal cut through a bovine tail intervertebral disc. Transmitted polarised light is used. The lamellar layers of the disc are clearly visible. The resolution of the full image is approximately 2μm.

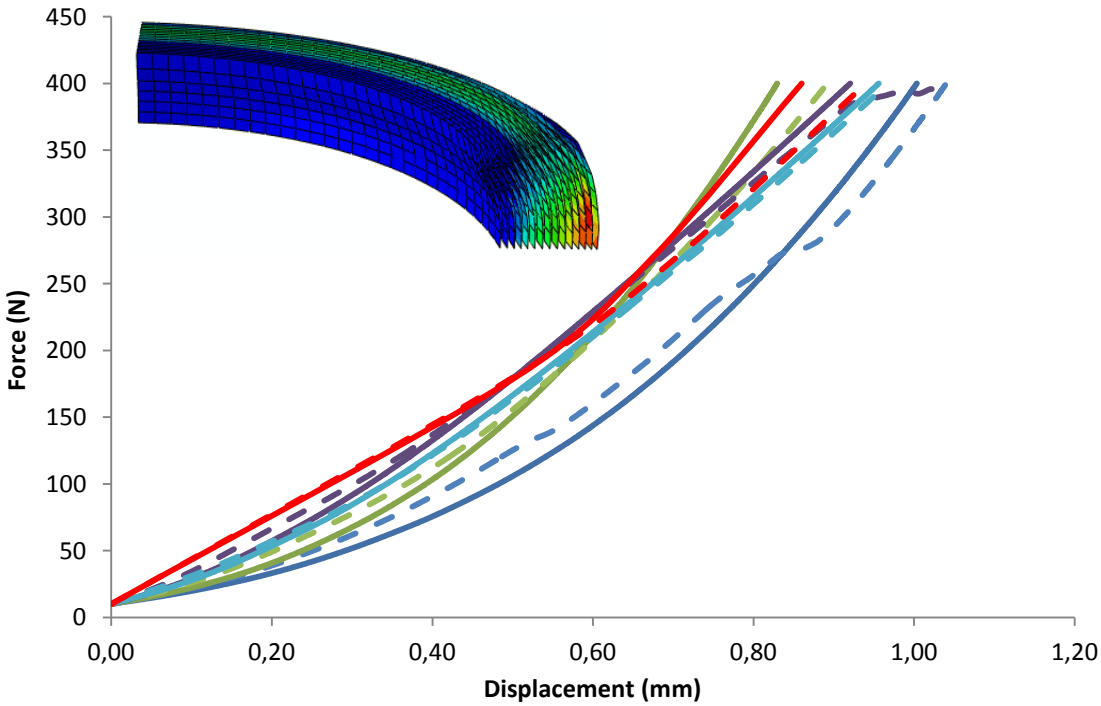

Figure 1.3. FE model comparison with disc compression experiment results (Solid lines represent compression tests performed on the intact disc, dotted lines represent tests performed after nucleotomy. The Finite Element Model predictions are in red, and the experiments (n=4) are in blue and green. Contours of collagen fibre von Mises stress are shown in the inset (Max stress in red is approximately 20-25MPa under 400N axial compression).