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which it can be utilised within the context of anatomical research and teaching. In addition, health and safety issues arising during cadaveric preservation must be considered; at present embalming necessitates the use of chemicals which may potentially present a danger to the health of both staff and students.

The Thiel method of embalming produces cadavers with more life-like qualities, however there is a distinct lack of information as to how and why the method works. Additionally, the method still utilises chemical components which are considered hazardous to human health and which may be subject to future changes in legislation governing their use.

The aim of this study is to understand the effects of formalin and boric acid on cadaveric tissue, within the context of Thiel's embalming method, using histological and biomechanical investigations. Preliminary studies, using mouse skeletal muscle samples, have shown differences between traditional formalin-fixed tissues and Thiel-fixed tissues. The traditional formalin fixed specimens displayed a regular appearance, with cell integrity and alignment remaining substantially intact, nuclei were present and visible, and there was no apparent distortion in the size or shape of the cells. In comparison the Thiel fixed samples showed an elongated, oval cell shape, with no visible nuclei present and an apparent increase in cell volume, however cell alignment and membrane integrity appears to remain relatively intact, with no apparent signs of membrane disruption. This would indicate that the components of the Thiel solution are significantly altering the tissue structure at a cellular level, or are not preventing post-mortem changes. Further investigations using mouse skeletal muscle samples preserved by Thiel solution without the formalin component show significant differences from those preserved using standard Thiel solution. These differences include changes to the muscle cell shape, a reduction in cell alignment and, in some instances, an increase in extracellular spaces. This suggests that formalin has a notable influence on the tissue structure within the context of the Thiel solution. Similar results are observed when boric acid is removed from the standard Thiel solution.

Results from this study will allow an improved understanding of why the Thiel method produces more life-like cadavers, as well as enhancing the possibility of finding suitable replacements for these chemicals.

#### The story of Dutch body donors

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The number of body donor registrations in the Netherlands has witnessed a steep increase for several years. To explore this upward trend and motives for donation, a survey was conducted (n = 759) among registered body donors in the database of the Department of Anatomy at the University Medical Center of

Groningen (UMCG). In addition, qualitative in-depth interviews were held with twenty of the body donors from the survey. The results of the research show the stories behind body donation: the motives of body donors, their social background and personality characteristics, and their attitude towards life and death. These insights are not only relevant for body donor programmes elsewhere struggling with a scarcity of body donors, but also for more sensitive and humane guidelines.

#### Correlation between 3D imaging methods in studying bone architecture: SEM, microCT and confocal LM

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Computerised x-ray microtomography ( $\mu$ CT) is increasingly used in the 3D study of bone microarchitecture and in quantifying bone volume fractions. However, the volumetric resolution in laboratory apparatus for small rodent studies is at best several microns linear and recognisable detail characterising forming, resting and resorbing surfaces is completely missing. Backscattered electron mode scanning electron microscopy (BSE SEM) of both macerated 3D samples and polished surfaces of blocks of PMMA embedded tissue provides this information but samples have to be cut and processed. The same PMMA material is good for confocal fluorescence microscopy (CSLM) for both tissue morphology and the study of tetracycline and calcein mineralising front labels to 50–200 microns deep to the block surface. With the recent acquisition of SEM with variable chamber pressure to permit examination of uncoated specimens, we are able to conduct CSLM after SEM for correlation studies. Here, we report new approaches to correlation between all these imaging methods in the study of 70% ethanol fixed normal femurs from  $\sim$  330 g male Lewis rats from another study. Microtomography used a Scanco  $\mu$ CT 40 system using 45 or 55 kV and 8  $\mu$ m linear voxel size. The distal femur was bisected longitudinally with a water cooled diamond saw, one half was macerated in alkaline pronase and the other embedded in PMMA prior to 20 kV 3D BSE imaging. Embedded block faces were imaged uncoated in the SEM and by confocal microscopy. Volumetric data analysis used ImageJ. Drishti software (Australian National University) was used to reconstruct views corresponding to the SEM images with particularly good matches between SEM and  $\mu$ CT for the macerated trabecular bone. Extensive regions of thin trabeculae were frequently missing in the  $\mu$ CT reconstruction. This is clearly a partial volume problem but it draws attention to the fact that an extensive network of fine trabeculae are lost to  $\mu$ CT visualisation and analysis on a routine basis. These fine rods are frequently  $\sim$  7 and down to  $<$  2  $\mu$ m in gauge, well below the detection limit for  $\mu$ CT. Their existence overturns results and theories about interconnectedness.

#### Characterisation of the ossified avian tendon

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