

Descamps, E., J. Buytaert, D. Adriaens & J. Dirckx (2010) - High-resolution and non-invasive 3D-visualisation of soft tissues in vertebrates – the use of OPFOS. Annual Meeting of the Society of Integrative and Comparative Biology (Seattle, USA). (poster presentation)

ABSTRACT:

Three-dimensional visualisation tools have been applied in biological sciences for decades, generally relying on destructive histological protocols. It is only with micro-CT-scanning becoming readily accessible that non-invasive 3D-visualisation has become popular in biology. At its best, resolution achieved in micro-CT nowadays approaches that of standard histological techniques. Apart from bone, even soft tissues can be made visible through micro-CT-scanning, however, discriminating between structures of the same tissue as well as between different tissue types remains a challenge. An alternative approach, which seems yet to be explored to its full potential, is Orthogonal-Plane Fluorescence Optical Sectioning microscopy (OPFOS). This method is for instance used for studying the suspensory tissues and bones of the middle ear, but has not yet found its way in many other fields of biology. To test the potential of this method for discrimination between different types of tissues, as well as different structures of the same tissue type, we applied this technique to stage 46 tadpoles of *Xenopus laevis*. Three-dimensional reconstructions were generated using Amira, and compared to reconstructions made using serial histological sections. In this poster, an overview is given of the pros and cons of both techniques, with a discussion on their applicability for a wider scope of biological research.