

X-RAY PHASE CONTRAST TOMOGRAPHY FOR THE INVESTIGATION OF ALS DISEASE

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The study focuses on the degenerations of peripheral and central nervous system at relevant disease phases in mice affected with SOD, an animal model for Amyotrophic Lateral Sclerosis (ALS), using X-ray phase-contrast tomography (XPCT). Compared to standard X-ray Tomography, XPCT is an advanced technique that allows three-dimensional reconstruction of bio-medical samples without any sectioning or aggressive preparation or use of contrast agents. XPCT is a powerful technique to analyze low absorbing objects and enables a multiscale imaging ranging from cellular-level up to the whole-organ. We analyzed mice spinal cords at different stages of ALS, providing deeper knowledge on the degeneration of motor neurons and vascularization in the central nervous system as well as their 3D spatial distribution. The analysis was therefore extended to the peripheral nervous system, both in the anterior and posterior spinal nerves, as the peripheral motor nerve damage precedes neuronal degeneration within the spinal cord. We will show, at different time points, the quantification of the variations in the vascular and neuronal networks of the spinal cord, already detectable in a pre-symptomatic stage of the disease. We correlated these results with those obtained in the peripheral nervous system, where, thanks to the high spatial resolution, we quantify the orientation of spinal nerve fibers. This preclinical study will be able to lay the groundwork for future clinical applications

Biography

G Begani Provinciali has completed her Master's degree in January 2018 and she is employed as a Research Fellow at the Institute of Nanotechnology (CNR, Rome Unit). She has published one paper in reputed journals and she is Co-author of a book chapter in press.

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