

Imaging Gold-Loaded Tumor Cells Implanted into the Rat Spinal Cord using Computed Tomography

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Therapeutic approaches using implantation of cells to stall or cure the disease in multiple sclerosis, Parkinson's disease or acute neurotrauma are still in the developmental stage. One of the major concerns is that implanted cells can form tumors in distant organs. We are in the process of developing a synchrotron-based imaging protocol that we hope will allow us to trace implanted cells in a live host organism.

Material and Methods: Our experiments were conducted at the SYRMEP beamline of the Elettra synchrotron (Italy). Phase contrast images were produced using a monochromatic x-ray beam in CT modes as well as a micro CT unit. C6 glioma cell cultures were exposed to colloidal gold in the growth medium and implanted in spinal cords of adult male Wistar rats. Animals were sacrificed at various time points after implantation and tissues stored in formalin until used.

Results: Gold-loaded cells were seen in the spinal cords after implantation and following tumor development. 3D reconstructions of the tumor cells revealed cell clusters penetrating the surrounding bone as well as larger intact tumors.

Conclusion: Synchrotron-based imaging proved a valuable tool for the detection of gold-marked cells in our animal model.

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