

## IN VIVO BIOCOMPATIBILITY ASSESSMENT OF FUNCTIONALIZED CARBON NANO-ONIONS (f-CNOs) IN ZEBRAFISH

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Functionalized carbon nano-onions (f-CNOs) have many attractive properties for biomedical applications such as high cellular uptake, low cytotoxicity and weak inflammatory potential [1]. To address the ecological effects of f-CNOs, we employ zebrafish (*Danio rerio*), as vertebrate model, to examine such effects on embryonic development. The toxicity parameters evaluated include survival rate, hatching rate, heartbeats, frequency of movements and possible presence of different types of malformations. Moreover, the biodistribution in zebrafish larvae of boron dipyrromethene (BODIPY) functionalized CNOs, suitable for high resolution imaging [2], is studied by means of inverted selective plane illumination microscopy (iSPIM) [3]. This technique has been shown as an improved imaging tool for 3D imaging of thick samples, such as zebrafish embryos. Our results contribute to the current understanding in the biosafety of carbon nanomaterials.

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[2] J. Bartelmess, E. De Luca, A. Signorelli, M. Baldrighi, M. Becce, R. Brescia, V. Nardone, E. Parisini, L. Echegoyen, P.P. Pompa, S. Giordani "Boron dipyrromethene (BODIPY) functionalized carbon nano-onions for high resolution cellular imaging", *Nanoscale*, 6, 13761-13769 (2014).

[3] Z. Lavagnino, G. Sancataldo, M. d'Amora, P. Follert, D. De Pietri Tonelli, A. Diaspro, F. Cella Znacchi "4D (x-y-z-t) imaging of thick biological samples by means of Two-Photon inverted Selective Plane Illumination Microscopy (2PE-iSPIM) ", *Scientific reports*, 6, 23923 (2016).