Toxicity and fate of Gadonanotubes after intravenous administration in mice

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Gadonanotubes, superparamagnetic Gd^{3+}-ion clusters (1 + 5 nm) confined within ultrashort (20-80 nm) single-walled carbon nanotube capsules, have been shown to be high-performance T1-weighted contrast agents for magnetic resonance imaging (MRI).

At 1.5 T, 37 °C, and pH 6.5, the r1 relaxivity (ca. 180 mM^{-1} s^{-1} per Gd^{3+} ion) of gadonanotubes is 40 times greater than any current Gd3+ ion-based clinical agent.[1]

Gadonanotubes are also ultrasensitive pH-smart probes with their r1/pH response from pH 7.0-7.4 being an order of magnitude greater than for any other MR contrast agent.[1] However, the in vivo behavior of these clinical contrast agent candidate remain unknown.

Here, we shall report the preliminary results of efficacy, acute toxicity, biodistribution, and elimination of gadonanotubes in mice after intravenous administration.

[1] Keith B. Hartman. Nano Letters 2008 ; 8 (2) : 415-419