Zebrafish EMBRYOTOXICITY
Assessment of **Fluorescent SiO_2 NPs**

Ana Vieira[1], Ivone Pinheiro[1], Sofia Azevedo[1], Laura Rodríguez-Lorenzo[1], Marília B. Dos Santos[1], Chiara Barattini[2,3], Alfredo Ventola[2], Daniele Gori[2], Maria Ada Malvindi[4], Enrico Binetti[4,5,6], Begoña Espiña[1]

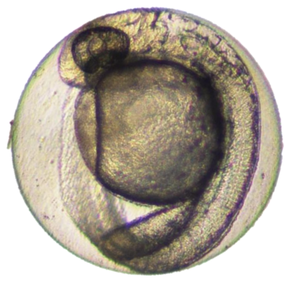
[1]Water Quality Group, International Iberian Nanotechnology Laboratory-INL, Av. Mestre José Veiga s/n 4715-330 Braga, Portugal. [2] AcZon S.r.l Via Lavino 265/D 40050, Monte San Pietro, Bologna, Italy. [3] Department of Biomolecular Sciences, University of Urbino Carlo Bo, 61029 Urbino, PU, Italy. [4] HiQ-Nano s.r.l., Via Barsanti, 73010, Arnesano, Lecce, Italy. [5] Institute for Microelectronics and Microsystems (IMM), CNR, Via Monteroni, Lecce, 73100, Italy. [6] Center for Biomolecular Nanotechnologies, Istituto Italiano di Tecnologia, Lecce, Italy.

Email: ana.vieira@inl.int

Due to **broad use of silica nanoparticles (SiO_2 NPs)** for multiple applications in different sectors worldwide [1,2] , it had become very important to assess it's ecotoxicity. For that, **three fluorescent SiO_2 NPs were analysed by zebrafish embryo Toxicity test,** using a modified version of **OECD TG 236**, which includes measurements of a list of sub-lethal endpoints (at 8, 32, 56 and 80 hours post fertilization – hpf) and quantification by fluorescence spectroscopy of NPs during exposure.

8 hpf

Yolk volume
Egg volume
Epiboly
SURVIVAL



32 hpf

Yolk /egg volume
Pupil / eye area
Head-trunk angle
Heart rate
Spontaneous mov.
SURVIVAL

56 hpf

Yolk volume
Eye area
Body length
Heart rate
Hatching
SURVIVAL

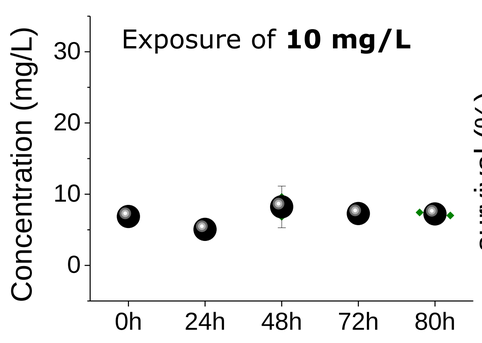
80 hpf

Free-swimming
Hatching
SURVIVAL

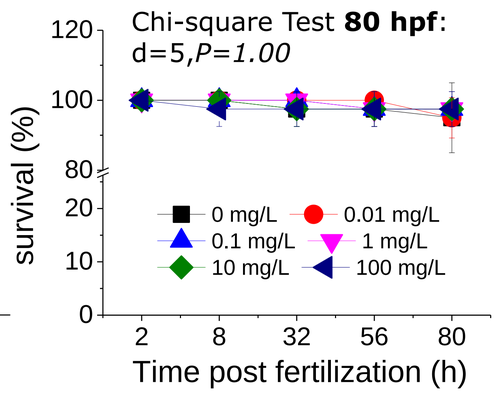
NFg530-NH_2
(Core-shell SiO_2 NPs)

20 nm
theoretical value

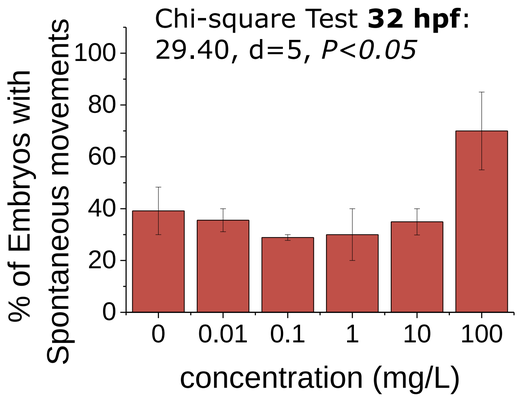
Real NPs concentration



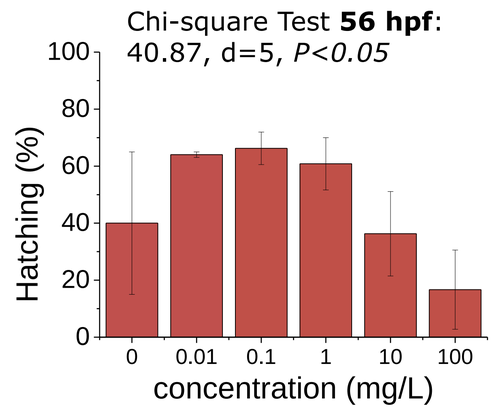
Survival rate



Spontaneous movements



Hatching



SiO_2 NPs tested induce
NO LETHAL TOXICITY
to the zebrafish embryos

When functionalized with –COOH, 50 nm Red Fluorescent SiO_2 NPs induced a sub-lethal effect related with neuro-motor coordination (namely, a decrease in spontaneous movements)

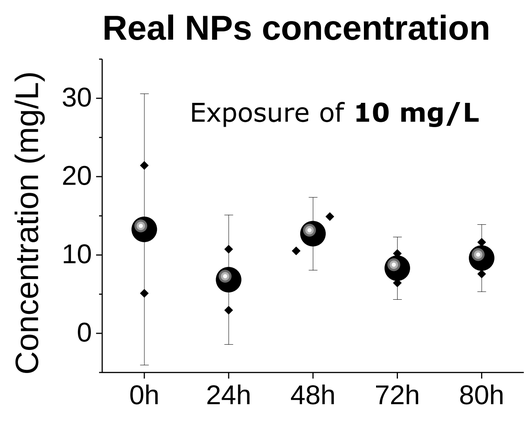
Fluorescent Core-shell SiO_2 NPs also triggered neuro-motor coordination alterations, particularly in spontaneous movements and hatching rate

50 nm Red Fluorescent SiO_2 NPs

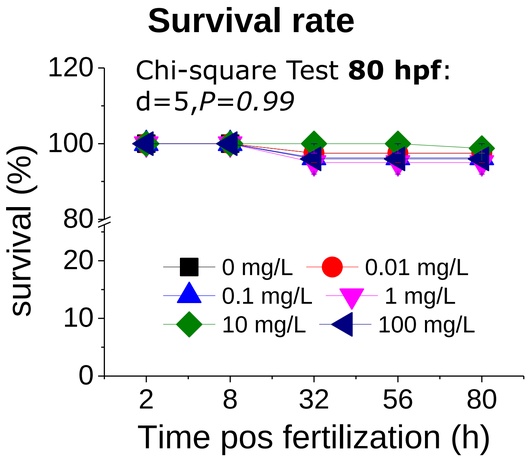
SiO_2

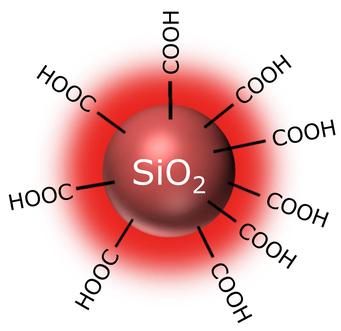
93.3 ± 7.4 nm
characterized by
Nanoparticle Tracking Analysis (NTA)
in fresh water

Real NPs concentration



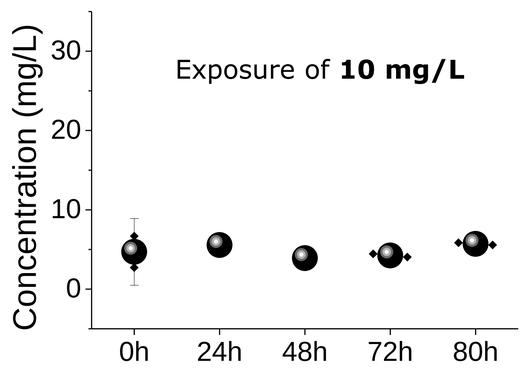
Survival rate



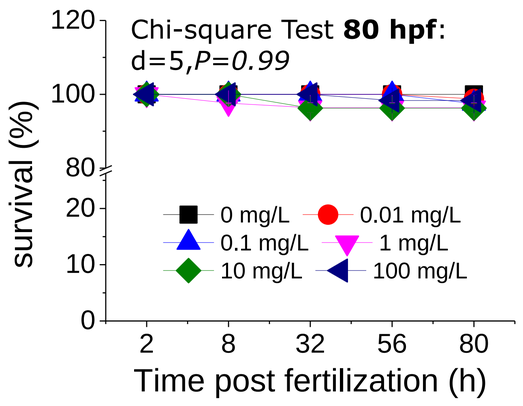


84.6 ± 7.4 nm
characterized NTA in fresh water

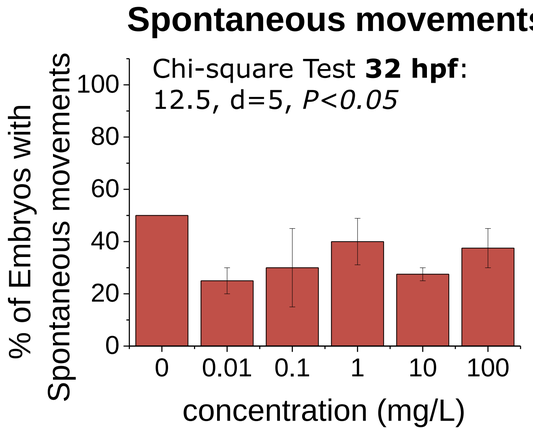
Real NPs concentration



Survival rate



Spontaneous movements



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