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Biotoxicity of free and chitosan-coated iron nanoparticles in *Drosophila melanogaster*

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Drosophila is a model organism for many research areas in Sciences. In toxicology, *Drosophila* has proved to be a suitable organism to test toxic effects of different chemical elements due to its short life cycle and abundant offspring. In this experiment, the effects of iron nanoparticles and iron nanoparticles covered with chitosan in the offspring number of *Drosophila melanogaster* were compared. Iron nanoparticles (10 nm) were synthesized by a coprecipitation method previously optimized, and characterized by means of FTIR-HATR spectroscopy, SEM-EDX and TEM microscopy. Four concentrations of nanoparticles (100, 250, 500 and 1000 mg/L) were fed to *Drosophila* by their application in culture media. After 2-3 weeks, the offspring was counted manually, and its iron content was measured by Flame Atomic Absorption Spectrophotometry (FAAS). It was found that iron nanoparticles in the highest concentration increased the amount of offspring in nearly 90%, while the offspring exposed to the same concentration of chitosan-covered nanoparticles increased only by 40%. On the other hand, chitosan-covered nanoparticles decreased the amount of iron absorbed by the flies, suggesting that this covering could limit the nanoparticle toxicity, thus improving its properties for its use in nanopharmacology. These results originate new research opportunities regarding the toxic effects of nanoparticles in the germinal line of flies and their association with fertility. For instance, Comet Assay could be used to determine the genotoxicity of iron nanoparticles in somatic and germinal line cells in order to establish the possible use of this kind of nanoparticles as a suitable drug-delivery-nanovehicle.

Biography

María Fernanda Pilaquinga has a Master degree in Chemical Science and Technology from the University of Balearic Islands-Spain. She has participated in Computational Chemistry and Nanochemistry research projects carried out in Ecuador and Spain. Currently, she is adjunct lecturer at the School of Chemical Sciences, Pontifical Catholic University of Ecuador.

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