III WORKSHOP ON

Environmental NANOTECHNOLOGY

PROGRAM & BOOK OF ABSTRACTS

December 05th to 08th, 2018

Auditorium of University of Sorocaba

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Confererence Venue: University of Sorocaba – Rodovia Raposo Tavares km 92,5, Sorocaba – São Paulo State - Brazil

Conference Website: http://uniso.br/hs/III-workshop-nanotecnologia-ambiental/

Publication: III Workshop in Environmental Nanotechnolgy will invited speakers and authors to submit their manuscripts to a Special Issue "Environmental Nanotechnology) to be published in **Energy, Ecology and Environment** – Springer – after a peer review process - https://www.springer.com/energy/journal/40974.

How can Nanotechnology help Agriculture? The HYPATIA project

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According to the United Nations Food and Agriculture Organization, the world population growth is estimated to reach 9.1 billion of people in 2050, with a 30% increase compared to that in 2010. A tremendous global increase in food production will be necessary to meet these demands. How to keep it efficient and sustainable is one of the major challenges that Agriculture, and the whole food supply chain have to face in the foreseeable future. However, increasing crops yield relies on massive use of agrochemicals, both fertilizers and pesticides, leading to an even more unsustainable system. Nanotechnology can contribute to minimize this negative impact through the development of smart delivery systems and nanocarriers for controlled release of agrochemicals[1]. Nanodevices can protect active substances and help to solubilize them and penetrate into plant and target organism's tissues[2-4]. In this way, the effectiveness of the agrochemicals could be increased, and lower doses would be necessary, diminishing adverse effect on the environment and side effects on non-target organisms. Although applications of these techniques are being developed mainly for different kind of pesticides, fertilizers can greatly benefit from them too. In that sense, HYPATIA project aims to reduce the amount of chemical fertilizer applied to plants and soils, developing a more efficient product using hydroxyapatite nanoparticles. This nanomaterial mimics the crystalline apatite forming bones[5] and has been shown as an interesting option for P fertilization in soybean[6].

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Keynote references:

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2. Corredor, E. *et al*. *BMC Plant Biology* **9**, 45 (2009).
3. Pérez-de-Luque, A. *et al*. *Pest Manag. Sci.* **68**, 67-74 (2012).
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5. Delgado-López, J.M. *et al*. *Adv. Funct. Mat.* **24**, 1090-1099 (2014).
6. Liu, R. and Lal, R. *Sci. Rep.* **4**, 5686 (2014).