



UNIVERSITÀ
di **VERONA**

Scuola di Dottorato
di **SCIENZE NATURALI E
INGEGNERISTICHE**

Corso di Dottorato in Nanoscienze e tecnologie
avanzate

Learning from magnetotactic bacteria: production of biomimetic magnetites and their potential use in clinics

Prof. Concepcion Jimenez Lopez, Department of microbiology, University of Granada, Spain

Much interest has gained the biomineralization process carried out by magnetotactic bacteria. These bacteria are ubiquitous in natural environments and share the ability to passively align along the magnetic field lines and actively swim along them. This ability is due to their magnetosome chain, each magnetosome consisting on a magnetic crystal enveloped by a lipid bilayer membrane to which very unique proteins are associated. Magnetotactic bacteria exquisitely control magnetosome formation, making the magnetosomes the ideal magnetic nanoparticle of potential use in many technological applications. The difficulty to scale up magnetosome production has triggered the research on the *in vitro* production of biomimetic (magnetosome-like) magnetite nanoparticles. In this context, magnetosome proteins are being used to mediate such *in vitro* magnetite precipitation experiments. The present course focuses on the knowledgement on the magnetosome proteins thought to have a role on the *in vivo* formation of magnetite crystals in the magnetosome, and the recombinant magnetosome proteins used *in vitro* to form biomimetic magnetite. It also summarizes the data provided in the literature on the biomimetic magnetite nanoparticles obtained from those *in vitro* experiments and describes their potential use in clinics.

Lessons will take place on 14th December in Aula Verde with the following timetable: 9.00-10.30, 11.00-12.30, 14.00-15.30, 16.00-17.30.