

# NANOSCIENCE AND NANOTECHNOLOGY PROGRAM

## Pérez-Guevara Fermín, PhD

### Research Interests

Apply of transport phenomena, analysis and modeling of bioprocesses to

- VOC's biofiltration
- Production & biodegradation of Microbial polymers as biodegradable materials
- Extracellular production of biodegradable nanoparticles.
- cry protein production by *B. thuringiensis*

Dr. Pérez-Guevara is full Professor in the Department of Biotechnology and bioengineering. He completed his MSc (process Eng.) at UNAM's Chemistry Fac. and PhD at the National Superior School of Chemical Engineers, Toulouse, France. He did post-doctoral stage supervising the installation and star-up of Environmental Technology Lab at Multidisciplinary Research Unit. Faculty Acatlán. UNAM. During this time he has maintain his research centered on transport phenomena, analysis and modeling of bioprocesses. From 1996, he's at B&B, Cinvestav, Mexico City. Dr. Pérez-Guevara is author of more than 20 publications that received approx. 300 citations. Dr. Pérez-Guevara has received independent grants to apply analysis techniques to diverse environmental bioprocesses as VOC's biofiltration, bio-insecticides and microbial polymers as biodegradable materials: (a) production & biodegradation of materials and composites based on P(HB-HV) and PHA by native and transformed *Cupriavidus necator* and (b) extracellular production of biodegradable nanoparticles.

### Selected Honours and Awards

- Silver Medal Gabino Barrera at MSC , UNAM
- National excellence recognition (SNI level 1)
- Science Frontiers Project. Conacyt 2016

### Selected Funding

- Conacyt,

## Research Project: yeast's vesicles as nanoreactors for new materials production

My lab use modeling based in transport phenomena analysis, to develop processes and transformed microbes for the production of new functional biodegradable polymers, including in form of nanoparticles. For that purpose physiological and energy requirements are considered as key factor for the scale up of lab-scale (flaks) studies to production units. In the case of *Cupriavidus necator* bacteria (formerly *Ralstonia eutropha*) we demonstrated that incorporation of medium-chain monomers is possible controlling fermentations conditions (Mex pat. 310716) by the native and transformant strains expressing *Pseudomonas putida* gens. Actually we promote the production of biodegradable polymeric nanoparticles by the immobilization of diverse synthase gene in the post-Golgi vesicles of *Saccharomyces cerevisiae* yeast and we are working in their purification and isolation with the aim yo use them as nanoreactors, in function of the immobilized enzyme.