

NANOSCIENCE AND NANOTECHNOLOGY PROGRAM

Juan Pedro Luna-Arias, PhD



Research Interests:

- * Molecular mechanisms involved in gene expression in the protozoan parasite *Entamoeba histolytica*, the pathogen fungus *Candida albicans*, and Breast Cancer cell lines.
- * Identification of molecular biomarkers for diagnosis and prognosis of Breast Cancer.
- * Biology of Cancer.
- * Mechanisms involved in the biosynthesis and degradation of the fungal cell wall.
- * Development of nanoparticles to be used as drug delivery systems.

Current research:

1. Identification of molecules of the transcription initiation complex in *Entamoeba histolytica*: TBP-associated factors (TAFs).
2. Determination of the functional role of TBPL1 in breast cancer.
3. Determination of the functional role of TAF1 in the heat shock response in human cells.
4. Identification of molecular biomarkers for diagnosis and prognosis of breast cancer by quantitative proteomics.
5. Development of diagnostic methods using nanotechnology. Currently, we are working on hydroxyapatite, colloidal gold, superparamagnetic iron oxide, and indium phosphide quantum dot nanoparticles.
6. Production of recombinant proteins of biological interest in prokaryote and eukaryote expression systems.
7. Characterization of the proteome of breast cancer cell lines from different stages and with different molecular classification: Proteome and bioenergetics of mitochondria.
8. Isolation of null mutants of exoglucanases and endoglucanases in *Candida albicans*.

Dr. Juan Pedro Luna-Arias is a Full Professor in the Department of Cell Biology at the Center for Research and Advanced Studies of the National Polytechnic Institute (Cinvestav-IPN). He earned a Bachelor's degree in Pharmacological and Biological Chemistry in the University of Guanajuato, Mexico in 1984, an MSc degree in Experimental Biology at the University of Guanajuato, Mexico in 1988, and a Ph.D. degree in Sciences (Biochemistry and Molecular Biology) at the University of Extremadura in Badajoz, Spain in 1993. He joined the Multidisciplinary Program in Molecular Biomedicine in 1994, and he moved to the Department of Cell Biology in 2003. Dr. Luna-Arias is also a member of the Faculty of the Ph.D. program in Nanoscience and Nanotechnology since its starting. He has published 58 research articles, co-edited one book in two volumes, and 12 book chapters. He has graduated 45 students, 14 Ph.D., 17 MSc, and 14 BSc. Currently, he is an adviser of 7 Ph.D., 1 MSc, and 11 BSc students. He has participated in more than 250 lectures in postgraduate programs in several national institutions, including Cinvestav-IPN, the National School of Biological Sciences of the National Polytechnic Institute (ENCB-IPN), National School of Medicine and Homeopathy of the National Polytechnic Institute (ENMH-IPN), Autonomous University of Mexico City (UACM), Iztacala Faculty of Superior Studies of the National Autonomous University of Mexico (FES-Iztacala-UNAM), University of Guanajuato, Juarez Autonomous University of Tabasco, among others. He has been reviewer or research articles for several international journals, including the Journal of Alzheimer's Disease, Journal of Proteomics, Journal of Proteome Research, and Acta Neuropathologica. He has been associated editor of the Journal of Alzheimer's Disease. He is a member of the Human Proteome Organization (HUPO) and the American Society for Biochemistry and Molecular Biology (ASBMB). He was Dean of Students at the Department of Cell Biology at Cinvestav-IPN (2012-2019). He is a member of the National Research System of Mexico (Level 2).