

Department of Environmental Science and Engineering

## Environmental Toxicology

IMAR – Instituto do Mar / CMA

Instituto Nacional de Saúde  
Dr. Ricardo Jorge



**Pedro M. Costa**

Post-Doctoral Researcher

Degree in Biology (FCUL), M.Sc. in Marine Modelling (IST-UTL) and Ph.D. in Environmental Science (FCT-UNL). Over 40 SCI papers and more than 40 communications in the area of research.

## Objectives

Taking the Sado Estuary as the main case study, it is aimed at understanding how contamination, especially sediment-bound, affects aquatic organisms and cell lines (as biological models). I am particularly interested in complex mixtures of toxicants and in the toxicological mechanisms underlying effects and responses, especially those related to DNA damage, apoptosis and cyto/histopathological alterations.

I work also on issues related to bioconservation, ecology and global change, especially if involving molecular and microscopy techniques.

## Methodology

The approaches imply bioassays with aquatic organisms (especially fish and molluscs) and collection of organisms in situ. Cell-based assays (with human cell lines) have also been undertaken in order to establish a bridge between ecological status and human health.

The analytical methodology aims at multiple endpoints, involving thus techniques focused on diverse levels of biological organization, such as the Comet assay for single-cell detection of DNA strand breakage, histochemistry and histopathology, electron microscopy, genome and transcriptome profiling, ELISA, enzyme-based assays, etc.

## Expected Results

The findings have, so far, brought new insights on the mechanistics of toxicant interactions and disclosed other effects *in vitro* and *in vivo* rather than those predicted by standard biomarker approaches. New aspects on animal physiology and microanatomy have also been brought to light. See for instance:

- **COSTA, P.M.**, RODRIGO, A.P. & COSTA, M.H. (2014). Microstructural and histochemical advances on the digestive gland of the common cuttlefish, *Sepia officinalis* L. *Zoomorphology* 133, 59–69.
- GONÇALVES, C., MARTINS, M., DINIZ, M.S., COSTA, M.H., CAEIRO, S. & **COSTA, P.M.** (2014, in press). May sediment contamination be xenoestrogenic to benthic fish? A case study with *Solea senegalensis*. *Marine Environmental Research*. DOI:10.1016/j.marenvres.2014.04.012
- PINTO, M., **COSTA, P.M.**, LOURO, H., COSTA, M.H., LAVINHA, J., CAEIRO, S. & SILVA, M.J. (2014). Determining oxidative and non-oxidative genotoxic effects driven by estuarine sediment contaminants on a human hepatoma cell line. *Science of the Total Environment* 478, 25–35.

Funding:

Fundação para a Ciência e Tecnologia (Grant nº SFRH/BPD/72564/2010)

