• Cellular and Molecular Neurology: strategies of neuroprotection in the neurodegenerative diseases and in the neurotoxicity induced by drugs and environmental chemicals. This research line aims at investigating the molecular mechanisms involved in neurodegeneration and in neurotoxicity as well as evaluating compounds that are able to interfere in these processes as a strategy of neuroprotection and treatment. For these purposes experimental models of neuropathies induced by chemicals, particularly peripheral neuropathy, and experimental models of Parkinson’s, Alzheimer’s and Huntington diseases are used.
Contact: (+55 16 3315-4159)
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Researcher: Prof. Antonio Cardozo dos Santos

• Biochemical Toxicology: Evaluation of mitochondrial and cellular changes induced by xenobiotics as a model to unveil their toxic mechanisms of action. The research focus the study of cellular and molecular mechanisms by which exogenous substances, including medicinal drugs, natural substances and industrial and environmental pollutants interfere with mitochondrial metabolism and its possible implications in several diseases; as well as the use of these changes as biomarkers of effect from exposure to toxic substances.
Contact: (+55 16 3315-0544)
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Researcher: Prof. Daniel Junqueira Dorta

• Ecogenotoxicological evaluation of environmental chemicals: Evaluation of the genotoxic, mutagenic and teratogenic potential of chemicals that could be released into the environment, using different endpoint in Salmonella thyphimurium, human cell culture and early stages of Zebrafish. These assays are complemented with ecotoxicological studies using aquatic organisms and determination of compounds in environmental samples, aiming the Risk Assessment. Additionally, we are developing 3D cultures of skin and hepatic cells, in order to obtain more reliable results considering the human health.
Contact: (+55 16 3315-4878)
Email: dpalma@usp.br
Researcher: Profa. Danielle Palma de Oliveira
• **Biochemical, Molecular and Functional Characterization of Animals Toxins.** Purification of biologically active compounds present in venoms from scorpions and snakes and toad poison by chromatographic methods. Biochemical and molecular characterization of toxins by determination of the molecular weight, isoelectric point, amino acid composition, amino terminal sequencing and enzymatic assays (proteases, hyaluronidases, and L-amino acid oxidases). Assessment of their actions on ion channels, the complement system, inflammation and other biological systems for the identification of compounds that could be used as models for the development of new drugs or as pharmacological tools.

Contact: (+55 16 3315-4275)
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Researcher: **Profa. Eliane Candiani Arantes Braga**

• **Toxicology of Metals and Metalloids.** Exposure to toxic elements in experimental models (rats and mouse). Biomarkers of oxidative stress. “Omics” tools in Toxicology.

Contact: (+55 16 3315-4701)
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Researcher: **Prof. Fernando Barbosa Junior**

• **Evaluation of antigenotoxic and antimutagenic effects of dietary bioactive compounds.** The aim of the research group is to identify dietary bioactive compounds, mainly antioxidants, with antigenotoxic and antimutagenic potential in experimental models in vivo and in vitro. It has also been investigated the mechanisms involved in the protection effects of dietary bioactive compounds against genomic instability induced by chemical compounds.

Contact: (+55 16 3315-4294)
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Researcher: **Profa. Lusânia Maria Greggi Antunes**

• **Nutrigenomics.** The aim of this research group is to apply the “omics” technologies to elucidate the effects of dietary bioactive compounds on methylation of DNA and expression of genes related to maintenance of health.

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Researcher: **Profa. Lusânia Maria Greggi Antunes**
• Investigation of the secondary metabolism. Several actions for the development of bioactive natural products have been taken at national and state level, in majority ones that led to the identification of substances with therapeutic potential. A prerequisite for clinical use is the chemical characterization of active targets and also the elucidation of possible metabolites. In this context, our research aims the establishment of a working platform that envisions supporting pre-clinical studies applying biomimetic organometallic catalysis and in vitro metabolism. For this purpose an extensive support of Mass Spectrometry is used looking to contribute for the analysis of the Brazilian Biodiversity.

Contact: (+55 16 3315-4707)
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Researcher: Prof. Norberto Peporine Lopes

• Animal venoms and anti-venoms of plant origin: isolation and biochemical, functional and structural characterization of the major toxic components of animal venoms. To investigate the biochemical (molecular weight, amino acid composition, amino-terminal sequencing, isoelectric point, etc.), biological (activities on hemostasis, antitumor, myotoxic, phospholipase, hemorrhagic, edema, and L-amino acid oxidase assays, among others), and structural characteristics (determination of primary, secondary and tertiary structures) of the isolated components of these venom. To investigate anti-venoms in medicinal plants, and study their neutralizing mechanism of action, aiming at long term, to obtain new drugs of plant origin.

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