Synthesis and characterization of organic compounds, determination of ADME parameters, in vivo pharmacokinetics, analysis of complex matrices and foods

UNIVERSITÀ DI SIENA
1240

RESEARCHER

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DEPARTMENT:
Biotechnology, Chemistry and Pharmacy

Research activity

Broad spectrum antivirals: The group identified active compounds against emerging viruses (i.e. Zika, Dengue, SARS-COV-2) in collaboration with national and international research groups (European Union's Horizon 2020 Research and Innovation Programme ZikaAlliance, Tuscany Region Grant Ricerca Salute 2018 TUSCAVIR.NET, PRIN 2017 ORIGINALE CHEMIE, POCARNO 2023).

Analysis of novel foods and circular economy: Study the upcycling by-products in insects. Analysis of the influence insect-derived components in the prevention of cardiovascular diseases. This project, is aimed at identify and produce novel components of edible insects endowed with beneficial properties for the prevention of cardiovascular risk factors such as hypercholesterolemia and hypertension. The project is carried out in collaboration with the Italian Council for Agricultural Research and Economics - Research Centre for Plant Protection and Certification (CREA-DC).

Technologies and services

Analysis of Absorption, Distribution, Metabolism, and Excretion (ADME) properties of small molecules, fundamental for understanding the safety and the efficacy of a drug candidate. In detail:

- Thermodynamic and Kinetic solubility;
- Passive and active permeability, efflux;
- Stability in different solvents and medium, metabolic stability and first phase metabolites determination.

Pharmacokinetics (PK) in mice and biodistribution (Phase A ministerial authorization already obtained, phase B auth. available in less than 3 months)

Determination of PK parameters (i.e $t_{1/2}$, AUC, Cmax, Clearance)

Biodistribution in target organs

Different administration routes are available (i.p, per òs, intravenous)

Acute and repeated toxicity in insects

We can determine the LD_{50} for experimental compounds in our *Tenebrio molitor* model (no authorization required).

Analysis of contaminants in foods and drugs

HPLC-MS, LC-MS/MS, GC-MS

Applications and collaborations

Analysis of ADME properties (Alfa Sigma, Università degli Studi di Siena, UNIPI, UNIGE, UNIPG)

Determination of acute and repeated toxicity in insects (UNIPI, CREA-DC)

Determination of *in vivo* PK (Alfa Sigma, UNISI, UNIPI, UNIGE)

Analysis of contaminants in foods and drugs (CEVA, Anima Aurea)

For more information

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