

Molecular Neuropharmacology

Group leader

Pol Rigau, Olga (IR)

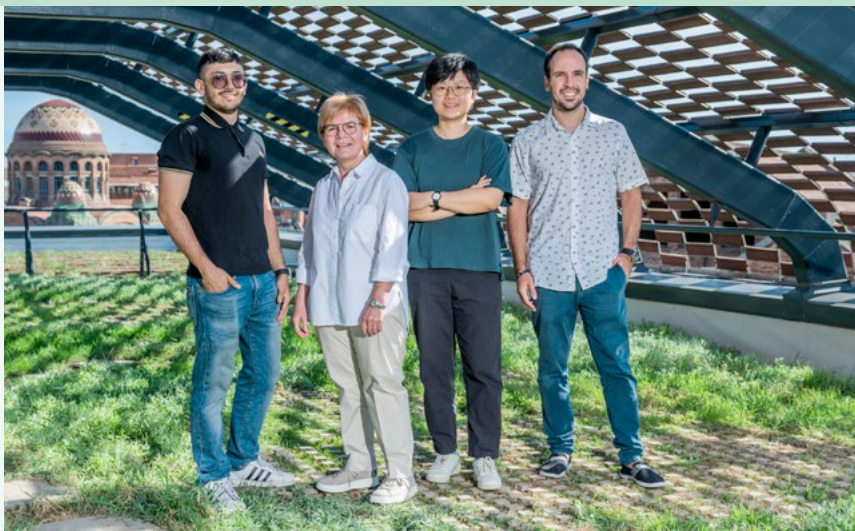
Researchers

Bai, Xue (UAB)

Martínez Martel, Ignacio (UAB)

Negrini Ferrari, Sylmara Esther (UAB)

Pereira Coutinho, Joana (UAB)



DESCRIPTION

Chronic pain is an important clinical problem due to the low efficacy of conventional treatments and their numerous side effects. Chronic pain is also accompanied by emotional disorders such as depression, anxiety, and memory loss, which negatively influence the perception of pain, creating a vicious circle that contributes to the deterioration of the patients' quality of life. Our primary objective is to develop new treatments that effectively relieve chronic pain and the associated comorbidities by using pharmacological, molecular, and genetic techniques.

MAIN LINES OF RESEARCH

- ReseaNew strategies for the treatment of chronic pain. Identification of new compounds that effectively inhibit postoperative, inflammatory, osteoarthritic, and/or neuropathic pain induced by nerve injury or chemotherapy and their underlying mechanisms of action. (Pol Rigau, Olga).
- New therapies for the emotional disorders associated with chronic pain. Investigation of the role played by new drugs in the modulation of anxiety- and depressive-like behaviours and/or cognitive deficits accompanying persistent pain. (Pol Rigau, Olga).
- Neuropharmacology of opioids and cannabinoids. Development of new strategies to potentiate the pain-relieving effects of

- opioids, cannabinoids and other conventional analgesics during chronic pain, minimising the adverse effects of these drugs. (Pol Rigau, Olga).
- Sex-related differences in chronic pain and mood disorders. Evaluation of the impact of sex on pain sensitivity and tolerance, and on the effectiveness of treatments used for chronic pain and related mental illnesses. (Pol Rigau, Olga).
- New stratagems for the treatment of fibromyalgia. Identification of new approaches to treat two main symptoms of fibromyalgia, sensory and emotional deficits, and study the main mechanisms implicated. (Pol Rigau, Olga).

SCIENTIFIC CHALLENGES

- Identify new pharmacological compounds that effectively abolish chronic pain with few side effects and whose use can be transferred to clinical practice and/or be patentable.
- Evaluate the antidepressant, anxiolytic and pain-relieving effects of novel nanoparticles capable to liberate one or more gases and study their actions on the functional disability and memory loss linked with chronic pain.
- Identify new antioxidants as potential therapeutic targets and study their effects on pro-inflammatory signals and plasticity changes induced by nerve injury, chemotherapeutic agents, or metabolic disorders.
- Evaluate the neuroprotective, anti-inflammatory and antioxidant mechanisms involved in the modulation of inflammatory pain induced by the heme oxygenase 1 enzyme and its interaction with the endogenous cannabinoid and opioid systems.
- Analyse the impact of sex on pain sensitivity and the efficacy of molecular hydrogen in inhibiting the allodynia and anxiodepressive-like behaviours accompanying chemotherapy-induced neuropathic pain.
- Develop new strategies to enhance the effectiveness of conventional analgesics for avoiding their side effects during chronic pain.
- Find new pharmacological targets for treating pain and emotional behaviours associated with fibromyalgia, and study their mechanism of action.

ACTIVE & AWARDED GRANTS

- Pol Rigau, Olga. Nuevas dianas moleculares para el tratamiento del dolor crónico. PI21/00592. Instituto de Salud Carlos III (ISCIII). Duration: 2022-2026. 166.980,00 €

SCIENTIFIC PRODUCTION

- Martínez I, Bai X, Kordikowski R, Leite C, Pol O. The Combination of Molecular Hydrogen and Heme Oxygenase 1 Effectively Inhibits Neuropathy Caused by Paclitaxel in Mice. *Antioxidants*. 2024; 13(7):856. DOI:10.3390/antiox13070856. PMID:39061924. IF:6,000 (Q1/2D). Document type: Article.