Molecular Neuropharmacology

Coordinator
Pol Rigau, Olga IR
opol@santpau.cat

Members
Ferrerira Chamorro, Pablo Aníbal UAB
Leanez Morilla, Sergi IR
Mendes Gomes, Joyce UAB
Penelas Pintos, Irene UAB
Redondo Arbós, Alejandro UAB
Riego Sánchez, Gabriela UAB

Main Lines of Research

- Chronic pain affects a high percentage of population and is difficult to treat even with the most potent analgesic compounds, which represents one of the main challenges in the current research of pain. Our main objective is to investigate new strategies for the treatment of chronic pain by using pharmacological, molecular and genetic approaches.
- The main lines of research are to:
  - Investigate new targets for the treatment of chronic pain. Identify new drugs capable to alleviate inflammatory, arthritic, and/or neuropathic pain and evaluate its mechanism of action in different animal pain models.
  - Establish new strategies for the treatment of diabetic neuropathy. Identify new approaches for treating neuropathy and oxidative stress, two of the main complications associated to diabetes, by evaluating the role played by the activation of transcription factor Nrf2/HO-1 signaling pathway in type I and II diabetic animals.
  - Study the emotional disorders associated to chronic pain. Investigate the role played by gaseous neurotransmitters in the modulation of the anxiety- and depressive-like behaviors associated to chronic inflammatory and neuropathic pain in animals.
  - Investigate the neuropharmacology of opioid and cannabinoid receptors. Establish new strategies to enhance the analgesic effects produced by opioids and cannabinoids during the treatment of chronic pain avoiding the development of side effects.

Challenges

Our scientific challenges are to:

- Identify new pharmacological compounds that effectively abolish chronic pain without side effects and which use can be transferred to clinical practice and/or patentable.
- Develop new effective approaches for the treatment of diabetic neuropathy, oxidative stress and obesity associated to the development of type 2 diabetes in transgenic mice.
- Establish the role played by gaseous neurotransmitters in the modulation of anxiety and depression associated with the development of chronic inflammatory and neuropathic pain
- Advance in the knowledge of the molecular mechanisms involved in the increased analgesic actions produced by opioids and cannabinoids combined with Nrf2/HO-1 signaling pathway activators during chronic pain.

Collaborations

Collaborations with other IIB Sant Pau Groups

- Metabolic Bases of Cardiovascular Risk (PI: Francisco Blanco)

External Collaborations

- Prof. Christie Ramos Andrade Leite-Panissi. University of São Paulo. Brazil.
- Prof. Luiz Guilherme de Siqueira Branco. University of São Paulo. Brazil.
- Prof. Roberto Motterlini. INSERM U955, University Paris-Est. France.
- Prof. Lydia Giménez-Llort. Universitat Autònoma de Barcelona. Spain
- Prof. Gianfranco Balboni. University of Calgari. Italy

Active Grants

- Olga Pol Rigau. Nuevas estrategias en el tratamiento de la neuropatía diabética PI14/00927. Instituto de Salud Carlos III. Duration: 2015-2018. 71,500.00 €.
- Olga Pol Rigau. Possible interaction CO-NO in the emotional and nociception modulation: role of locus coeruleus PVE 2014. Ciencia sin Fronteras. Duration: 2015-2018.

Note: Total amount granted to PI. It does not include indirect costs.

Awards

- The Molecular Neuropharmacology Group has been awarded with the Prize in basic area for its communication "The induction of the transcription factor Nrf2 inhibits hypersensitivity to pain and increases the analgesic action of morphine in animals with chronic inflammatory pain" in the XIV Congress National of the Spanish Society of Pain celebrated in Murcia, Spain. June 2017.

Scientific Production

***TIF: 10.159 **MIF: 5.0795**

McDonnell C., Leanez S., Pol O., The induction of the transcription factor Nrf2 enhances the antinociceptive effects of delta-opioid receptors in diabetic mice (2017) PLOS ONE, 12 (7).
IF: 2.766

McDonnell C., Leanez S., Pol O., The inhibitory effects of cobalt protoporphyrin IX and cannabinoid 2 receptor agonists in type 2 diabetic mice (2017) INT J MOL SCI, 18 (11).
IF: 3.687

Redondo A., Chamorro P.A.F., Riego G., Leanez S., Pol O., Treatment with sulforaphane produces antinociception and improves morphine effects during inflammatory pain in mice (2017) J PHARMACOL EXP THER, 363 (3), 293-302.
IF: 3.706

*Total Impact Factor **Mean Impact Factor