



3.1.4 Involvement of Glycinergic and Glutamatergic Systems in Central Nervous System Pathologies Group

Publications: 4 | **Q1:**3

COMPOSITION

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STRATEGIC OBJECTIVES

- Role of glutamate and glycine transporters in physiological and pathological aspects of glutamatergic and glycinergic neurotransmission.
- Involvement of glutamate transporters in excitotoxicity, ischemia and traumatic brain injury
- Pathologies of glycinergic neurotransmission such as hyperekplexia and pain
- Role of the adult neurogenesis in neurorepair.

RESEARCH LINES

1. Physiological and pathological aspects of glutamate fluxes in brain as potential targets to prevent excitotoxicity, associated with brain disfunctions like ischemia, o traumatic brain injury, with special interest in intracellular traffic and characterization of interactomes of transporters and receptors of glutamatergic synapses.
2. Glycinergic neurotransmission. Identification and characterization of new GlyT2 mutations (SLC6A5 gene) associated to human hyperekplexia. Effects of the mutations on transporter structure, function, proteostasis and glycinergic neurotransmission. Role in presynaptic hyperekplexia of different genes related to GlyT2 trafficking, interactoma, posttranslational modifications. Rescue interventions.
3. Study of plastic adaptations affecting glycine transporters in physiological and pathological nociception. Regulation of GlyTs by receptors modulating nociceptive signaling (P2XR, P2YR, mACh, nACh, α2 adrenergic, 5-HT). Signaling pathways.
4. Physiological and pathological aspects of Neuronal reparation by adult neurogenesis:
 - a. Identification of novel regulatory mechanisms of adult neurogenesis by kinases.
 - b. Identification of novel regulatory mechanisms of adult neurogenesis by microRNAs and other non-coding RNAs.
5. GABAergic neurotransmission. Identification and characterization of new mutations in SLC6A1 gene (GABA transporter GAT-1) associated to epilepsy. Effects of the mutations on transporter structure, function in GABAergic neurotransmission. Pharmacological treatments with pharmacochaperones.



RESEARCH ACTIVITY

Doctoral Theses

- **Felipe Mendía R.** Regulación y modificación del transportador de glicina GlyT2[dissertation]. *Madrid: UAM: 2023(26/10/2023). Director: López Corcuera B.*

Final Degree Theses

- Vázquez Medel A. Caracterización de mutantes de GLYT2 asociados a hiperplexia humana[dissertation]. *Madrid: UAM: 2023(26/05/2023). Director: López Corcuera B*

Publications

- **del Puerto A, López-Fonseca C, Simón-García A, Martí-Prado B, Barrios-Muñoz AL, Pose-Utrilla J, López-Menéndez C, Alcover-Sánchez B, Cesca F, Schiavo G, Campanero MR, Farinas I, Iglesias T, Porlan E.** Kidins220 sets the threshold for survival of neural stem cells and progenitors to sustain adult neurogenesis. *Cell Death Dis.* 2023; 14(8): 500. Article. IF: 8.1; Q1
- **Piniella D, Canseco A, Vidal S, Xiol C, de Bustamante AD, Martí-Carrera I, Armstrong J, Bastolla U, Zafra F.** Experimental and bioinformatic insights into the effects of epileptogenic variants on the function and trafficking of the GABA transporter GAT-1. *Int J Mol Sci.* 2023; 24(2): 955. Article. IF: 4.9; Q1

- **Piniella D, Zafra F.** Functional crosstalk of the glycine transporter GlyT1 and NMDA receptors. *Neuropharmacology.* 2023; 232: 109514. Article. IF: 4.6; Q1
- **Sirerol-Piquer MS, Morante-Redolat JM, Porlan E.** Editorial: Unravelling neural stem cell biology: players and strategies. *Front Cell Dev Biol.* 2023; 11: 1206339. Editorial Material. IF: 4.6; Q2

Research projects

- **López Corcuera B.** El transportador neuronal de glicina glyt2 en dolor y en hiperplexia. Implicaciones patológicas en desarrollo (PID2020-119399RB-I00). Ministerio de Economía, Industria y Competitividad. 2021-2024. *Managment centre: UAM*
- **López Corcuera B.** El transportador neuronal de glicina GlyT2 en hiperplexia: una patología glicinérgica del desarrollo. Fundación Ramón Areces. 2021-2024. *Managment centre: Fundación Severo Ochoa*
- **Porlan Alonso E.** Nuevos reguladores farmacológicos de la neurogénesis adulta y la reprogramación directa (PID2019-104763RB-I00). Ministerio de Economía, Industria y Competitividad. 2020-2023. *Managment centre: UAM*