

COINS Seminar #60

[Date] October/7/2021 (Thu.) 16:00-17:30 (The web meeting room will be open at 15:45) in Japan Standard Time.

[Venue] ZOOM webinar *web conferencing software. we will let you know URL by the day before.

[Registration] URL: <https://coins.kawasaki-net.ne.jp/form/seminar60/index.html>

Title :

Targeting neurons: more brain than brawn to solve obesity

Abstract :

The alarming global increase of obesity and related complications suggests an urgent need for new therapeutic strategies. Strong evidence shows that obesity and diabetes are regulated by hypothalamic neurons, creating a new paradigm in the management of these diseases by targeting neurons. Up to now, neuron-related diseases are not adequately treated due to the lack of approaches to effectively reach specific cell populations. A major obstacle to improve clinical outcomes of central therapies relies on the inability to deliver therapeutically relevant doses of the drug/cargo to diseased cells or regions. Other factors such as blood brain barrier crossing, off target effects, toxicity and chemical instability also limit the treatment of these pathologies. Nanomedicine-based approaches provide promising opportunities for overcoming these limitations.

Speaker : Rosalia Rodriguez-Rodriguez, PhD

Affiliation : Universitat Internacional de Catalunya
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Position : Associate Professor,
Head of the Biomedical Sciences Degree

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<https://www.uic.es/neurolipid-group>

<https://www.uic.es/en/teacher/rrodriguez>



<CV>

Rosalia Rodriguez-Rodriguez is Associate Professor in Pharmacology at the Universitat Internacional de Catalunya in Barcelona. She currently leads the research line "Hypothalamic regulation of obesity" in the Neurolipid Group and is the Head of the Biomedical Sciences Degree. Her research interests are the neuronal control of obesity and associated complications such as diabetes and vascular diseases and the development of new therapies to target neurons.

She obtained the PhD in Pharmacology by the University of Sevilla (Spain) in 2006, investigating the beneficial effects of olive oil triterpenoids in hypertension and atherosclerosis. Part of the research was performed with Prof. Ulf Simonsen in Aarhus University (Denmark) and Prof. Lina Badimón (ICCC Barcelona). In 2007, she joined the group of Dr. Kim Dora (University of Bath and Oxford University, UK) as a post-doc to explore the mechanisms that regulate myogenic tone in microvessels. In 2010-2014 worked as assistant professor in Pharmacology Department (University of Sevilla) to characterize vascular and adipose tissue alterations in obesity and diet-based approaches.

Since 2014 she works in UIC Barcelona, when she studies neural lipid metabolism and its importance in obesity, with particular interest on carnitine palmitoyltransferases (CPT1) and endocannabinoid hydrolases as therapeutic targets.

She is now PI of a bilateral project with Dr Quader in Japan to target CPT1 with nanomedicines and PI of a National project to study neuronal obesity. She also collaborates in projects related to development of organ-on-a-chip to study obesity and vascular diseases. She is Associate Editor of the section "Obesity" in Frontiers.

Selected publications:

Paraiso WKD, Garcia-Chica J, Ariza X, Zagmutt S, Fukushima S, Garcia J, Mochida Y, Serra D, Herrero L, Kinoh H, Casals N, Kataoka K, **Rodríguez-Rodríguez R**, Quader S. Poly-ion complex micelles effectively deliver CoA-conjugated CPT1A inhibitors to modulate lipid metabolism in brain cells. *Biomater Sci.* 2021 Aug 16.

Miralpeix, C.; Reguera, A.; Fosch, A.; Casas, M.; Lillo, J.; Navarro, G.; Franco, R.; Casas, J.; Alexander, S.P.H.; Casals, N; **Rodríguez-Rodríguez, R.** Carnitine palmitoyltransferase 1C negatively regulates the endocannabinoid hydrolase ABHD6 in mice, depending on nutritional status. *British Journal of Pharmacology* 2021, 178(7):1507-1523.

Garcia-Chica, J.; Paraiso, W.; Tanabe, S.; Serra, D.; Herrero, L.; Casals, N; Garcia, J.; Ariza, X.; Quader, S.; **Rodríguez-Rodríguez, R.** An overview of nanomedicines for neuron targeting. *Nanomedicine* 2020, 15(16): 1617-1636.

Miralpeix, C.; Fosch, A.; Casas, J.; Baena, M.; Herrero, L.; Serra, D.; **Rodríguez-Rodríguez, R.**; Casals, N. Hypothalamic endocannabinoids inversely correlate with the development of diet-induced obesity in male and female mice. *Journal of lipid research* 2019, 60(7): 1260-1269.

Rodríguez-Rodríguez, R.; Miralpeix, C.; Fosch, A.; Pozo Ariza, M; Calderón Domínguez, M.; Perpinyà, X.; Vellvehi, M.; López, M.; Herrero, L.; Serra, D.; Casals, N. CPT1C in the ventromedial nucleus of the hypothalamus is necessary for brown fat thermogenesis activation in obesity. *Molecular Metabolism* 2019, 19:75-85.

<Key words>

Obesity; Diabetes; Hypothalamus; Lipid metabolism; Diet; CPT1; Neuron