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## BIOGRAPHICAL SKETCH

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NAME CIRUELA, Francisco	POSITION TITLE		
eRA COMMONS USER NAME (credential, e.g., agency login) fciruela	Professor of Pharmacology (16/6/2017- Ongoing)		
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	YEAR(s)	FIELD OF STUDY
University of Barcelona	BSci	1990	Biological Sciences
University of Barcelona	Ph.D.	1995	Biological Sciences

### A. Personal Statement.

My research at the University of Barcelona is focused on the study of **G protein-coupled receptors** (GPCRs) biology and pharmacology ([www.ub.edu/neuropharmacpain](http://www.ub.edu/neuropharmacpain)). Indeed, recent research has focused on elucidating the role of posttranslational modifications and protein-protein interactions (i.e. oligomerization) in the cell surface targeting and function of GPCRs. Hence, the development of either single or combined (i.e. multimodal) therapies able to finely modulate in space and time neurotransmitter receptors involved in such modifications/interactions would overcome classical therapeutic approaches, in which these complex connections were not initially considered. In this regard, we are using genomic, proteomic and optopharmacological techniques to refine the pharmacotherapy of certain neurological diseases (i.e. Parkinson's disease, Alzheimer disease and Schizophrenia) and pain.

### B. Positions and Honors.

#### Positions and Employment

1997-1999	EMBO Fellow, MRC, University of Oxford
1999-2000	Welcome Trust Fellow, Pharmacology School, University of Oxford
2002-2003	Assistant Professor, Biochemistry, Chemistry School, University of Barcelona
2003-2007	"Ramón y Cajal" Resarcher, Biochemistry, Biology School, University of Barcelona
7/2007-10/2007	Short stay fellowship (3 months) with Prof. Jean-Pierre Vilardaga at the The Simches Research Center, Harvard Medical School, USA.
9/2012- 8/2015	Special Visiting Researcher, Neurosciences Post-graduate Program. Universidade Federal de Santa Catarina, Brazil.
1/2013- 1/2016	Guest Professor, Department of of Biochemistry and Microbiology, Faculty of Sciences, University of Ghent, Belgium.
1/2016-Ongoing	Coordinator of the Neuroscience Program at Institut d'Investigació Biomèdica de Bellvitge (IDIBELL), L'Hospitalet de Llobregat, Spain.
1/2017-Ongoing	Rector's Delegate for Strategic Research Actions and Senior Officer of the UB at the League of European Research Universities (LERU)

#### Awards

2008	Award in Pharmacology 2008 sponsored by the Spanish Society of Pharmacology and Almirall Laboratories ( <a href="http://www2.ub.edu/comunicacions/cgi/principal.pl?fitxer=noticies/noticia004709.htm">http://www2.ub.edu/comunicacions/cgi/principal.pl?fitxer=noticies/noticia004709.htm</a> ).
2010	"ICREA Acadèmia-2010". Award from the Catalan Institution for Research and Advanced Studies, a foundation supported by the Catalan Government.
2017	Grünenthal Foundation Award 2017 in Pain Research (Premio Fundación Grünenthal a la investigación en dolor 2017).

**C. Selected peer-reviewed publications (in chronological order).**

(Selected from 193 articles indexed in PubMed; h-index:49)

**Most relevant to the current application**

1. Ferré, S., Karcz-Kubicha, M., Hope, B.T., Popoli, P., Burgueño, J., Casadó, V., Fuxe, K., Lluís, C., Goldberg, S.R., Franco R. & **Ciruela, F.** (2002). Synergistic interaction between adenosine A<sub>2A</sub> and glutamate mGlu<sub>5</sub> receptors: Implications for striatal neuronal function. *Proceedings of the National Academy of Sciences of USA*, 99 (18), 11940-11945.
2. **Ciruela, F.**, Casadó, V., Rodrigues, R.J., Luján, R., Burgueño, J., Canals, C., Borycz, J., Rebola, N., Goldberg, S.R., Mallol, J., Cortés, A., Canela, E.I., López-Giménez, J.F., Milligan, G., Lluís, C., Cunha, R.A., Ferré, S. & Franco, R. (2006). Presynaptic control of striatal glutamatergic neurotransmission by adenosine A<sub>1</sub>-A<sub>2A</sub> receptor heteromers. *Journal of Neuroscience* 26 (7), 2080-2087.
3. Carriba, P., Navarro, G., **Ciruela, F.**, Ferré, S., Casadó, V., Agnati, L.F., Cortés, A., Mallol, J., Fuxe, K., Canela, E.I., Lluís, C. & Franco, R. (2008). Detection of Heteromerization of More than Two Receptors by Sequential BRET-FRET. *Nature Methods* 5(8), 727-733.
4. García-Negredo, G., Soto, D., Llorente, J., Morató, X., Galenkamp, K.M.O., Gómez-Soler, M., Fernández-Dueñas, V., Adelman, J.P., Shigemoto, R., Fukozawa, Y., Luján, R. & **Ciruela, F.** (2014). Co-assembly and coupling of mGlu<sub>5</sub> receptors and SK2 channels. *Journal of Neuroscience* 34 (44), 14793–14802.
5. Soto-Cerrato, V., Manuel, P., Hernando, E., Calabuig, S., Martínez, A., Fernández-Dueñas, V., Sahlholm, K., Knöpfel, T., García-Valverde, M., Rodilla, A., Korrodi-Gregorio, L., Jantus, E., Farras, R., **Ciruela, F.**, Pérez-Tomás, R. & Quesada, R. (2015). Facilitated anion transport by synthetic small molecules induces hyperpolarization of the cell membrane that triggers differentiation and cell death in cancer stem cells. *Journal of American Chemical Society* 137(50),15892-15898.
6. Gómez-Santacana, X., Pittolo, S., Rovira, X., Dalton, J., López-Cano, M., Zussy, C., Faucherre, A., Jopling, C., Pin, J.P., **Ciruela, F.**, Goudet, C., Giraldo, J., Gorostiza, P. & Llebaria, A. (2017). Illuminating phenylazopyridines to photoswitch metabotropic glutamate receptors: from the flask to the animals. *ACS Central Science* 3 (1), 81–91.
7. Sokolina, K., Kittanakom, S., Snider, J., Kotlyar, M., Maurice, P., Gandía, J., Benleulmi-Chaachoua, A., Tadagaki, K., Wong, V., Maly, R.H., Deineko, V., Aoki, H., Amin, S., Riley, L., Yao, Z., Morató, X., Rahmati, S., Kobayashi, H., Menéndez, J., Auerbach, D., Angers, S., Pržulj, N., Bouvier, M., Babu, M., **Ciruela, F.**, Jockers, R., Jurisica, I. & Stagljar, I. (2017). Systematic interactome mapping of protein-protein interactions for clinically-relevant human GPCRs. *Molecular Systems Biology* 13 (3), 918.
8. Font, J., López-Cano, M., Notartomaso, S., Scarselli, P., Di Prieto, P., Bresolí-Obach, R., Battaglia, G., Malhaire, F., Rovira, X., Catena, J., Giraldo, J., Pin, J.P., Fernández-Dueñas, V., Goudet, C., Nonell, S., Nicoletti, F., Llebaria, A., **Ciruela, F.** (2017). Optical control of pain *in vivo* with a photoactive mGlu<sub>5</sub> receptor negative allosteric modulator. *eLife* 6, e23545.
9. Sahlholm, K., Gómez-Soler, M., Valle-León, M., López-Cano, M., Taura, J., Watanabe, M., **Ciruela, F.\*** & Fernández-Dueñas, V.\* (2018). Antipsychotic efficacy of dopamine D<sub>2</sub> receptor biased ligands is dependent on adenosine A<sub>2A</sub> receptor expression. *Molecular Neurobiology* 55 (6), 4952–4958.  
\*Corresponding authors
10. Taura, J., Nolen E.G., Cabré, G., Hernando, J., Squarzialupi, L., López-Cano, M., Jacobson, K.A., Fernández-Dueñas, V. & **Ciruela, F.** (2018). Remote control of movement disorders using a photoactivable adenosine A<sub>2A</sub> receptor antagonist. *Journal of Controlled Release* 283, 135-142.

**D. Research Support****Ongoing Research Support**Grant: SAF2017-87349-R Ciruela (PI) 2018/2020

Ministerio de Economía y Competitividad-Spanish Government.

Project title: “Lighthing up dopamine, adenosine and GPR37 receptors in neurological and neuropsychiatric diseases”

Grant: SBO-140028 Ciruela (PI & partner of the consortium) 2015/2018

IWT, Flemish Agency for Innovation by Science and Technology.

Project title: “Unravelling the pharmaceutical potential of receptor heterodimers for therapeutic interventions in CNS disorders”