# Fernando Kasanetz

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## Current Posiction

- **Adjunct Researcher** 2018–
  *Physiology of Pain Lab, Systems Neuroscience Group (GNS)*
  Institut of Physiology and Biophysics "Bernardo Houssay" (IFIBIO Houssay)
  Faculty of Medical Sciences, University of Buenos Aires
  National Council of Scientific and Technical Research (CONICET)

## Education

**PhD in Biological Sciences** Buenos Aires, Argentina
University of Buenos Aires 03/2001–03/2006
Faculty of Exact and Natural Sciences

- PhD Tesis: "Cortical control of striatal activiy"
- Director: M Gustavo Murer
- Departament of Physiology and Biophysics, Faculty of Medical Sciences, University of Buenos Aires

**Bachellor (Licenciado) in Biological Sciences** Buenos Aires, Argentina
University of Buenos Aires 03/1995–12/2000
Faculty of Exact and Natural Sciences

## Personal Statement

**As the Principal Investigator of the Laboratory of Physiology of Pain at the Institute of Physiology and Biophysics Houssay (IFIBIO Houssay, CONICET) within the School of Medicine at the University of Buenos Aires, my research is dedicated to exploring the dynamic and adaptive changes that occur in neuronal circuits as they relate to the onset and progression of neurological and psychiatric disorders. Neuronal plasticity is at the core of these changes, allowing brain circuits to adapt their connectivity and function in response to a myriad of environmental stimuli. When this plasticity is altered, it can profoundly affect brain function, contributing to the pathophysiology of various mental health conditions such as drug addiction, chronic pain, and depression. Since establishing my independent research group in 2018, my primary focus has been to unravel the mechanisms by which chronic pain influences the brain's reward circuitry, potentially leading to both enhanced pain perception and the onset of mood disorders. My laboratory employs a multidisciplinary approach, leveraging advanced techniques that I mastered during my doctoral and postdoctoral training. These include electrophysiological methods to investigate synaptic physiology and plasticity in both brain slices and in vivo, state-of-the-art imaging techniques for monitoring calcium activity in neurons in vivo, and behavioral assays designed to study nociception and related mood disorders. Through this work, I aim to contribute to a deeper understanding of the neural underpinnings of chronic pain and its interplay with mood disorders, with the ultimate goal of identifying novel therapeutic targets for these debilitating conditions.**

## Prvious Experience

**Post-doctoral Fellow** — Berna, Suiza
Institute of Physiology, University of Bern — 10/2013 - 08/2017
- Supervisor: Thomas Nevian

**Post-doctoral Fellow** — Bordeaux, France
Physiopathologie de la plasticité neuronale, Neurocentre Magendie — 08/2009 - 03/2013
Université de Bordeaux - INSERM
- Supervisor:Pier-Vincenzo Piazza

**Post-doctoral Fellow** — Bordeaux, France
Physiopathologie de la plasticité neuronale, Neurocentre Magendie — 08/2006 - 07/2009
Université de Bordeaux - INSERM
- Supervisor:Olivier Manzoni

**Doctoral Fellow** — Buenos Aires, Argentina
Argentine National Council of Scientific and Technical Research - CONICET — 04/2002 - 03/2006
- Supervisor: M Gustavo Murer

**Doctoral Fellow** — Buenos Aires, Argentina
"Carrillo-Oñativia" Fellowship, Argentine Ministry of health — 04/2001 - 03/2002
- Supervisor: M Gustavo Murer

**Undergraduate Fellow** — Buenos Aires, Argentina
"Research Incentive" Fellowship, University of Buenos Aires — 04/2000 - 03/2001
- Supervisor: M Gustavo Murer

## Teaching

- **Teaching Assistant first class** — 03/2004 - 07/2006
  *Faculty of Medical Sciences, University of Buenos Aires*
  Department of Physiology and Biophysics (Neurophysiology section)
- **Teaching Assistant second class** — 03/2000 - 02/2004
  *Faculty of Medical Sciences, University of Buenos Aires*
  Department of Physiology and Biophysics (Neurophysiology section)

## Mentoring

**Leslie Spring Valdivia**
Research Director - Assistant Researcher from Conicet — 10/2024 -
Physiology of Pain Lab, IFIBIO Houssay, Faculty of Medical Sciences and CONICET

**María Jesús Trujillo**
PhD Thesis Director - Doctoral Fellowship from Conicet — 04/2021 - 03/2026
Faculty of Exact and Natural Sciences, University of Buenos Aires

**María Jesús Trujillo**
Bachelor Thesis Director - Bachelor in Biological Sciences — 04/2019 - 12/2020
Faculty of Exact and Natural Sciences, University of Buenos Aires

**Constanza Ilarraz**
PhD Thesis Director - Doctoral Fellowship from Conicet 04/2018 - 03/2024
Faculty of Pharmacy and Biochemistry, University of Buenos Aires

**Rebecca Johnson**
Master in Neuroscience Thesis Director 2012
Joint Master in Neuroscience, University of Strasbourg

**Olivier Lasalle**
Master Thesis Co-director 2008
Université Victor Segalen (Bordeaux II) Neurosciences et Neuropsychopharmacologie

## Contributions to science

### Postdoctoral Training in Dr. Thomas Nevian's Lab

During my postdoctoral training in Dr. Thomas Nevian's lab, I delved into the study of the brain mechanisms underlying pain perception and the maladaptive changes in brain circuits associated with chronic neuropathic pain (NP), a debilitating neurological condition of high clinical relevance. We employed in vivo electrophysiology and in vivo imaging of calcium transients using a chronically implanted GRIN lens and miniature microscope (Miniscope) to investigate how noxious stimuli are encoded in the Anterior Cingulate Cortex (ACC), a key cortical region involved in the affective processing of pain. Our findings revealed that population activity, not single-cell responses, allowed discriminating noxious from other sensory stimuli, ruling out the existence of nociception-specific neurons. Peripheral nerve injury-induced NP led to dysfunctional encoding of sensory events by exacerbation of responses to innocuous stimuli and impairment of pattern separation and stimulus classification, which were restored by analgesic treatment. These findings provided a novel interpretation for altered cortical sensory processing in NP and gave insights into the effects of systemic analgesic treatment in the cortex. This work was recently published:

- Acuña*, M., Kasanetz*, F., De Luna, P., Falkowska, M. & Nevian, T. Principles of nociceptive coding in the anterior cingulate cortex. *Proc Natl Acad Sci U S A.* **120** (2023). *equal contribution.
- Kasanetz, F. & Nevian, T. Increased burst coding in deep layers of the ventral anterior cingulate cortex during neuropathic pain. *Scientific Reports* **1**, 24240 (2021).

### Independent Research in Buenos Aires

More recently, since establishing my independent research group in Buenos Aires, we have continued investigating the role of the meso-cortico-limbic system in pain physiology and pathology through several projects. Initially, we focused on corticostriatal neurons of the ACC (ACC-CS), which may play a key role in transferring nociceptive information to the basal ganglia (BG) and the mesolimbic system. We explored the synaptic plasticity occurring in these neurons during NP and identified mechanisms that may mediate the enhanced transmission of aberrant cortical activity to the BG. Additionally, we are investigating the encoding of the affective and motivational aspects of pain in ACC-CS neurons using in vivo calcium imaging with Miniscopes. Moreover, we are dissecting the network and cellular mechanisms of dopaminergic modulation of pain processing in the insular cortex. The initial findings from these studies have been recently published:

- Trujillo, M. J., Ilarraz, C. & Kasanetz, F. Plasticity of Cortico-striatal Neurons of the Caudal Anterior Cingulate Cortex During Experimental Neuropathic Pain. *Neuroscience* **523** (2023).

## First Postdoctoral Training in Bordeaux

During my first postdoctoral training in Bordeaux, I focused on identifying the synaptic mechanisms associated with the transition to cocaine addiction. This transition, which involves a shift from controlled drug use to drug dependence and addiction, occurs in only a subset of drug users after prolonged periods of consumption. Extensive preclinical research has revealed numerous long-lasting neuronal changes induced by drug exposure. However, distinguishing which drug-induced neurobiological changes are specifically associated with the behavioral manifestation of addiction has proven extremely challenging. To address this issue, we utilized a rodent model that, following extended cocaine self-administration, allows for the discrimination between animals that maintain control over drug use and those undergoing the transition to addiction. Through patch-clamp recordings in brain slices from adult rats, we studied synaptic physiology and plasticity in the cortico-accumbal pathway and discovered that addiction-like behaviors are associated with a persistent impairment of synaptic plasticity in the nucleus accumbens. Moreover, the behavioral addictive phenotype coincides with maladaptations observed at mGluR2/3 receptors in the prefrontal cortex. These studies have led to several publications, including:

- Kasanetz F, Deroche-Gamonet V, Berson N, Balado E, Lafourcade M, Manzoni OJ, Piazza PV. Transition to addiction is associated with a persistent impairment in synaptic plasticity. *Science*. **25;328(5986):1709-12.** (2010).
- Kasanetz F, Lafourcade M, Deroche-Gamonet V, Revest JM, Berson N, Balado E, Fiancette J-F, Renault P, Piazza PV, Manzoni OJ. Prefrontal synaptic markers of cocaine addiction-like behavior in rats. *Molecular Psychiatry* **18(6):729-37. doi: 10.1038/mp.2012.59** (2013).

## Colaborations

During my postdoctoral stage in Bordeaux I had the opportunity to collaborate with local and international colleges on projects addressing different aspects of the cannabinoid modulation of synaptic transmission. This works resulted in several publications, including:

- Schneider M, Kasanetz F, Lynch DL, Friemel CM, Lassalle O, Hurst DP, Steindel F, Monory K, Schäfer C, Miederer I, Leweke FM, Schreckenberger M, Lutz B, Reggio PH, Manzoni OJ, Spanagel R. Enhanced functional activity of the cannabinoid receptor 1 drives adolescent behavior. *The Journal of Neuroscience*. **35(41):13975-88.** (2015).
- Vallee M, Vitiello S, Bellocchio L, Hébert-Chatelain E, Monlezun S, Martin-Garcia E, Kasanetz F, Baillie GL, Panin F, Cathala A, Roullot-Lacarrière V, Fabre S, Hurst DP, Lynch DL, Shore DM, Deroche-Gamonet V, Spampinato U, Revest JM, Maldonado R, Reggio PH, Ross RA, Marsicano G, Piazza PV. Pregnenolone can protect the brain from cannabis intoxication. *Science* **343(6166):94-8.** (2014).

## PhD thesis in the University of Buenos Aires

The general goal of my PhD research was to investigate how the activity of the cerebral cortex is integrated within the striatum. The striatum serves as the input structure of the cortico-basal ganglia loop, receiving extensive inputs from nearly the entire cerebral cortex in a topographically organized manner and sending information back to the cortex via other basal ganglia nuclei and the thalamus. Proper striatal function is critical for motor and habit learning, as well as for the execution of coordinated movements. To study how cortical inputs modulate the activity of striatal principal neurons (SPNs) in vivo, we performed intracellular recordings of SPNs simultaneously with ECoG or cortical multiunit activity in anesthetized rats. We then analyzed the temporal and spatial influence of cortical activity on SPN membrane potential. Our findings demonstrated that the duration of SPN depolarizations (UP states) is finely regulated by the activity patterns

of cortical neuron ensembles. As expected, we found that SPN UP states reflect the precise spatial organization of cortico-striatal connectivity, with SPNs closely following the activity of the cortical regions from which they receive the densest projections. However, this topographical segregation in controlling striatal activity is disrupted by cross-talk, allowing less directly related cortical areas to influence SPN UP states. This finding may represent a mechanism by which the basal ganglia integrate information from different modalities to produce adaptive responses. The results from this work have led to several publications, including: publications, including:

- Kasanetz F, Riquelme LA, Della-Maggiore V, O'Donnell P, Murer MG. Functional integration across a gradient of corticostriatal channels controls UP state transitions in the dorsal striatum. *Proc Natl Acad Sci U S A.* **105(23):8124-9.** (2008).
- Kasanetz F, Riquelme LA, O'Donnell P, Murer MG. Turning off cortical ensembles stops striatal Up states and elicits phase perturbations in cortical and striatal slow oscillations in rat in vivo. *Journal of Physiology (London)* **577(Pt 1):97-113.** (2006).
- Kasanetz F, Riquelme LA, Murer MG. Disruption of the two-state membrane potential of striatal neurones during cortical desynchronisation in anaesthetised rats. *Journal of Physiology (London)* **543(Pt 2):577-89.** (2002).

## Publications

The complete list of publications can be found in MyBibliography

## Oral Presentations at Symposia

1. **Network dynamics of nociceptive and aversive processing in the ACC during the transition to chronic pain.** Presented at Neural Circuits of Pain, Satellite symposium of the 10th European Pain Federation Meeting. Heidelberg, Germany, September 3-5, 2017.
2. **Network dynamics of nociceptive and aversive processing in the ACC during the transition to chronic pain.** Presented at BENESCO (Bern Network Epilepsy Sleep Consciousness) 5th Winter Research Meeting. Wengen, Switzerland, March 9-11, 2017.
3. **Network dynamics of nociceptive processing in the anterior cingulate cortex.** Presented at EPFL Brain Mind Institute Symposium: "Connectivity and Plasticity of Neural Circuits"; Lausanne, Switzerland, December 12-13, 2016.
4. **Network dynamics of nociceptive processing in the anterior cingulate cortex.** Presented at Giessbach Meeting: Cellular and Molecular Neurobiology of Mental Disease, May 19-21, 2016.
5. **Transition to addiction is associated with a persistent impairment in synaptic plasticity.** Presented at the symposium of the European Research Area Network-Neuroscience (ERA-Net NEURON), at the VIII FENS FORUM of Neuroscience. Barcelona, July 18, 2012.
6. **Synaptic plasticity associated with the transition to addiction.** Presented at "Synapse Day," Bordeaux Neuroscience Institute, April 4, 2011.
7. **Synaptic plasticity and transition to addiction.** Presented at "Stress, Addiction, and Eating Disorders," Neurocentre Magendie, Bordeaux Neuroscience Institute, February 5, 2009.
8. **Synaptic correlates of cocaine addiction.** Presented at "La Journée Scientifique," Bordeaux Neuroscience Institute, March 14, 2008.

## Congress presentations

1. Trujillo MJ, Vasallu F, López M, Muller Igaz L,Kasanetz F. Multi-domain behavioral analysis in a mouse model of persistent neuropathic pain. XXXVIII Meeting of the Argentine Society for Neuroscience Research (SAN), San Luis, Argentina (2023).

2. Trujillo MJ, Unger J, López Díaz A, Kasanetz F. Towards a comprehension of dopaminergic modulation of pain: physiological, morphological and neurochemical characterization of dopamine-sensitive neurons of the Anterior Insular Cortex. XXXVIII Meeting of the Argentine Society for Neuroscience Research (SAN), San Luis, Argentina (2023).

3. Ilarraz C, Trujillo MJ, Acuña M, Presta A, Nevian T, Kasanetz F. Instrumental role of cortico-striatal neurons of the Anterior Cingulate Cortex in the manifestation of pain-related unpleasantness. XXXVIII Meeting of the Argentine Society for Neuroscience Research (SAN), San Luis, Argentina (2023).

4. Trujillo MJ, Kasanetz F. Characterization of the dopaminergic system in the anterior insular cortex of mice. XXXVII Meeting of the Argentine Society for Neuroscience Research (SAN), Buenos Aires, Argentina (2022).

5. Ilarraz C, Acuña M, Nevian T, Kasanetz F. "Encoding of the unpleasantness of pain in cortico-striatal neurons of the Anterior Cingulate Cortex" en XIII FENS Forum, Paris, France (2022).

6. Trujillo MJ, Ilarraz C, Kasanetz F. Synaptic and cellular plasticity of cortico-striatal neurons of the Anterior Cingulate Cortex associated to neuropathic pain. Meeting of the Argentine Society for Neuroscience Research (SAN), virtual modality; Argentina (2020).

7. Ilarraz C, Acuña M, Nevian T, Kasanetz F. Nociceptive responses of cortico-striatal neurons of the Anterior Cingulate Cortex in an animal model of chronic pain. XXXV Meeting of the Argentine Society for Neuroscience Research (SAN), virtual modality; Argentina (2020).

8. Trujillo MJ, Ilarraz C, Kasanetz F. Functional plasticity of cortico-striatal neurons of the Anterior Cingulate Cortex during the transition to chronic pain. XXXIII Meeting of the Argentine Society for Neuroscience Research (SAN), Cordoba, Argentina (2019).

9. Kasanetz F, Nevian T. Network dynamics of nociceptive and aversive processing in the anterior cingulate cortex. XXXIII Meeting of the Argentine Society for Neuroscience Research (SAN), Cordoba, Argentina (2018).

10. Ilarraz C, Trujillo MJ, Kasanetz F. Mood disorders in animal models of neuropathic pain. XXXIII Meeting of the Argentine Society for Neuroscience Research (SAN), Cordoba, Argentina (2018).

11. Acuña M, Kasanetz F, Nevian T. Network dynamics of pain processing in the anterior cingulate cortex. XI FENS Forum, Berlin, Germany (2018).

12. Kasanetz F, Santello M, Nevian T. Network dynamics of nociceptive processing in the anterior cingulate cortex. The Society for Neuroscience 46th Annual Meeting, San Diego, United States (2016).

13. Kasanetz F, Lafourcade M, Deroche-Gamonet V, Revest JM, Berson N, Balado E, Fiancette J-F, Renault P, Piazza PV, Manzoni OJ. Prefrontal synaptic markers of cocaine addiction-like behavior in rats. The Society for Neuroscience 42nd Annual Meeting, New Orleans, United States (2012).

14. Kasanetz F, Piazza PV, Manzoni O. Interactions between mGluRs and NMDA receptors underlie LTD in the nucleus accumbens. VII FENS Forum, Amsterdam, Netherlands (2010).

15. Derroche-Gamonet V, Kasanetz F, Berson N, Balado E, Lafourcade M, Manzoni O, Piazza PV. Transition to addiction is associated with a persistent impairement in synaptic plasticity. VII FENS Forum, Amsterdam, Netherlands (2010).

16. Lassalle O, Sepers M, Kasanetz F, Marsicano G, Manzoni O, Kieffer BL. Functional interactions between mu opioid and cannabinoid CB1 receptors in the nucleus accumbens. VII FENS Forum, Amsterdam, Netherlands (2010).

17. Kasanetz F, Robert N, Lafourcade M, Piazza PV, Deroche-Gamonet V, Manzoni OJ. Functional signature of cocaine addiction in the nucleus accumbens of adult rats. Societé Française des Neurosciences, 9e Colloque, Bordeaux, France (2009).

18. Kasanetz F, Robert N, Lafourcade M, Piazza PV, Deroche-Gamonet V, Manzoni OJ. Functional signature of cocaine addiction in the nucleus accumbens of adult rats. The Society for Neuroscience 38 Annual Meeting, Washington DC, United States (2008).

19. Kasanetz F, Robert N, Lafourcade M, Piazza PV, Deroche-Gamonet V, Manzoni OJ. Synaptic and cellular correlates of cocaine addiction in the nucleus accumbens of adult rats. VI FENS Forum, Geneve, Switzerland (2008).

20. Kasanetz F, Belluscio M, Riquelme LA, Murer MG. Influence of ongoing activity on striatal medium spiny neurons response to cortical stimulation. The Society for Neuroscience 34st Annual Meeting, San Diego, United States (2004).

21. Kasanetz F, Riquelme LA, O'Donnell P, Murer MG. Spatial Integration of cortical activity by striatal medium spiny neurons. IBAGS VIII, 8th International Triennial Meeting, Crieff, Scotland (2004).

22. Kasanetz F, Peskin V, Riquelme LA y Murer MG. Increased excitability of striatal neurons during cortical desinchronization in hemiparkinsonian rats. IV Workshop in Neuroscience, Vaquerias, Cordoba, Argentina (2002).

23. Kasanetz F, Gelman D, Noain D, Rubinstein M, Riquelme LA and Murer MG. In vivo intracellular recording of striatal neurons in mice lacking D2 receptors. IV Workshop in Neuroscience, Vaquerias, Coirdoba, Argenina (2002).

24. Kasanetz F, Tseng K-Y, Riquelme LA, Murer MG. Disruption of the bistable membrane potential of striatal spiny neurons during cortical desynchronization. The Society for Neuroscience 31st Annual Meeting, San Diego, United States (2001).

25. Kasanetz F, Tseng KY, Riquelme LA, Murer MG. The global cortical activity pattern drives the striatal neuron membrane potential. III Workshop in Neuroscience, Vaquerias, Cordoba, Argentina (2001).

26. Tseng KY, Riquelme LA, Kasanetz F, Kargieman L, Murer MG. Nigrostriatal lesion alters the two-state spontaneous membrane potential fluctuations of neostriatal spiny neurons. IBAGS VII, Seventh International Triennial Meeting, Copthorne Resort, Waitangi, Bay of islands, New Zeland (2001).

27. Tseng KY, Riquelme LA, Kasanetz F, Kargieman L, Pazo JH, Murer MG. Influence of the nigrostriatal system on the spontaneous membrane potential fluctuations of neostriatal spiny neurons. XXXII Meeting of the Argentine Society of Experimental Pharmacology (SAFE), Mendoza, Argentina (2000).

28. Tseng KY, Riquelme LA, Kasanetz F, Pazo JH, Murer MG. The low frequency oscillatory firing of substantia nigra pars reticulata units from hemiparkinsonian rats is modulated by striatal D1 dopamine receptors. XXXII Meeting of the Argentine Society of Experimental Pharmacology (SAFE), Mendoza, Argentina (2000).

29. Kasanetz F, Tseng KY, Kargieman L, Riquelme LA, Murer MG. Spreading of slow cortical rhythms to the basal ganglia in experimental parkinsonism: role of NMDA receptors. XXXII Meeting of the Argentine Society of Experimental Pharmacology (SAFE), Mendoza, Argentina (2000).

30. Kasanetz F, Tseng KY, Riquelme LA, Raisman-Vozari R, Gershanik O, Murer MG. Expression and effects of brain derived neurotrophic factor in an animal model of Parkinson's disease. II Workshop in Neuroscience, Vaquerias, Cordoba, Argentina (2000).

## Book Chapters

1. Kasanetz F, Acuña M, Nevian T. Anterior cingulate cortex, pain perception andpathological neuronal plasticity during chronic pain. In *The Neurobiology, Physiology*, and Behavior of Pain. Edited by Rajkumar Rajendram, Victor R. Preedy, Vinood B Patel and Colin Martin. Elsevier. https://doi.org/10.1016/B978-0-12-820589-1.00018-X (2021).

2. Kasanetz F, Mato S, Sepers M, Manzoni OJ. Addiction and synaptic plasticity in the nucleus accumbens. In The Nucleus Accumbens: Neurotransmitters and Related Behaviours. Edited by Hélène N. David. Research Signpost, Kerala, India. (2008).

3. Zold CL, Belluscio M, Kasanetz F, Pomata PE, Riquelme LA, Gonon F, Murer MG. Converging into a Unified Model of Parkinson's Disease Pathophysiology. In Cortico-Subcortical Dynamics in Parkinson's Disease. Edited by Kuei-Yuan Tseng. Humana Press (2006).

4. Kasanetz F and Murer MG. Integration of cortical activity by striatal medium spiny neurons. The Basal Ganglia VIII. In Advances in Behavioral Biology v56. Edited by Bolam JP, Ingham CA and Magill, PJ. Springer Science and Media Inc (2005)

## Funding for Research and Development

**International Bran Research Organization (IBRO): Return Home Fellowship 2016.**

- 2017 - 2019
  Role: Principal Investigator
  Neuronal plasticity associated to chronic pain.
  Euros 20.000

  The objective of the project is to study the functional changes in striatal neurons that mediate increased pain sensitivity and the onset of psychiatric disorders during chronic pain.

**Bilateral Cooperation Program 2016 – Ministry of Science and Technology - CONICET, Argentina and Swiss National Science Foundation.**

- 2017 - 2020
  Role: Principal Investigator

Cortico-striatal neuronal plasticity and processing of pain affect during the transition to chronic pain
AR$ 150.000 (+ travel expenses)

This funding provides support to establish a collaboration with a Swiss laboratory. A significant portion of the budget is allocated to covering the mobility of PhD students and postdocs for short visits to the Swiss lab. The research project aims to study how corticostriatal neurons from the Anterior Cingulate Cortex and the principal neurons of the striatum process nociceptive information during the transition to chronic pain.

**PRH-2016-004 - PICT-2018-0003 - National Agency for the Promotion of Research, Technological Development, and Innovation.**

- 2022 - 2024
  Role: Principal Investigator
  Functional reorganization of the anterior cingulate cortex associated with chronic neuropathic pain.
  AR$ 2.000.000

  The aim of this project is to investigate the impact of neuropathic pain on the function of cortico-striatal neurons in the anterior cingulate cortex. To explore this, we will study how these neurons process nociceptive information during the transition to chronic pain and dissect synaptic and cellular plasticity under these circumstances.

**PICT-2018-0835 - Recently formed group.. National Agency for the Promotion of Research, Technological Development, and Innovation.**

- 2020 - 2022
  Role: Principal Investigator
  Cortico-striatal neuronal plasticity associated with pain chronicity.
  AR$ 570.000

  Building on the hypothesis of the previous project, the aim here is to study how neuropathic pain impacts the functional organization of striatal neurons. Changes in the activity of different striatal neurons and synaptic modifications in the cortico-striatal transmission originating from the anterior cingulate cortex will be investigated.

**Multiyear Research Plan (PIP) 2020 – National Council of Scientific and Technical Research (CONICET)**

- 2021 - 2023
  Role: co-Principal Investigator (co-PI: Dr. Diego Pafundo
  Contribution of distal inputs from the ventral hippocampus to the excitatory/inhibitory balance of the mPFC circuit in the pathophysiology of schizophrenia.
  AR$ 850.000

**Swiss Programme for International Research Projects by Scientific Investigation Teams (SPIRIT - SNSF)**

- 2024 - 2028
  Role: Collaborator (PI: Dr Camila Zold (ARG) and Dr Manuel Mameli (SWI)
  Neural substrates underlying threats repercussions on decision-making
  CHF 481.000

## Participation in Technological Development Activities

1. Participation in the collection of evidence required for filing a patent application for a drug that modulates the toxic effects of THC. Drug: AEF0117 - AelisFarma, France (2011 - 2013).

## Participation in Thematic Networks and Scientific Societies

1. Member of the Argentine Society for Neuroscience Research (SAN) (2018–present)
2. Member of the Society for Neuroscience (SFN), USA (2004–present)
3. Member of the International Association for the Study of Pain (IASP) (2019–present)
4. Member of the Federation of European Neuroscience Societies (FENS) (2007–2013)
5. Member of the Pain Research Interest Group (GIEID) of the Argentine Association for the Study of Pain (AAED) (2018–present)
6. Member of the Translational Pain Research Network (RITS-Dolor, CONICET) (2020–present)

## Awards and Honors

1. **Excellent Paper in Neuroscience Award (2011).** Granted by the European Research Area Network-Neuroscience (ERA-Net NEURON) for the paper: Transition to addiction is associated with a persistent impairment in synaptic plasticity. Science, 328(5986):1709-12.
2. **Postdoctoral Fellowship, AXA Research Fund (2011 - 2013).**
3. **Postdoctoral Fellowship, Conseil Régional Aquitaine, France (2009 - 2011).**
4. **PTravel Grant for the 8th International Triennial Meeting of IBAGS (2005).**
5. **Travel Grant for the 53rd Meeting of Nobel Laureates in Lindau, Germany (2003).**
6. **Travel Grant for the International Conference and Workshop: Cooperative Dynamics of Neural Systems, Gran Hotel Pucón, Pucón, Chile (2002).**