



Alix TIRAN-CAPELLO

French – 31 years old – Driving license

Contact:

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Languages:

French Mother tongue

English Fluent, scientific communication

German Good command, general communication

ACADEMIC BACKGROUND

PhD in neurosciences - Aix-Marseille Université

Institut de Neurosciences de la Timone

2014-2018

France

Master in Biology - Ecole Normale Supérieure de Lyon.

With honours. Majors: neurobiology, cell biology, complex systems.

2011-2013

France

Licence 3 of Biology, Ecole Normale Supérieure de Lyon

Equivalent to a Bachelor's degree. Majors: cell biology, genetics.

2010-2011

France

WORK EXPERIENCE

Postdoctoral research fellow

Northwestern university – Supervisor: Dr. M.D. Bevan

Influence of the Substantia Nigra in Huntington's disease physiology

2019 - 2020

Chicago, IL,

USA

- Patch-clamp and in-vitro physiology in multiple configuration
- Immunohistochemistry, cellular imaging (confocal & epifluorescence)
- Optogenetics and viral vector delivery in mice
- Recording hardware maintenance and optimization
- Familiarization with deep learning toolbox Keras in R
- Implementation of new statistical methods for data analysis
- Short term research projects with quarterly reports

PhD student

Institut de Neurosciences de la Timone - Supervisor: Dr. C. Baunez

Role of the hyper-direct projections between the prefrontal cortex and the subthalamic nucleus in reward coding and research in rats

2014 - 2018

Marseille,

France

- Statistical analysis with Matlab and Prism of behavioral data
- Offline video data analysis with Bonsai software
- DBS with recordings of oscillatory brain activity, analysis in Matlab
- Optogenetic platform set-up, hardware purchase and scientific watch
- Drug self-administration in rats, locomotion and behavioral assays
- Long term experiment planning with everyday presence (~4 months)
- University Teachings: General lectures, practical training

Internships:

Abroad: **NIDA**, Baltimore, USA | **MPI Brain**, Frankfurt, Germany

In France: **CRICM**, Paris | **CRNL**, Lyon | **INT**, Marseille.

Between 2010
and 2014

TECHNICAL EXPERIENCE

- Optogenetics: in-vivo, in-vitro applications in rodents,
- Deep brain stimulation in rodents
- Patch-clamp: Cell attached, whole cell, and perforated configurations
- Electrophysiological recording on freely moving rats
- Construction of electrodes, LFP and multi-units analysis
- Operant behavior, drug self-administration in rodents
- Stereotaxic and intravenous surgery in rodents (CNRS certification)
- Project management in rodents (CNRS certification)
- Use of viral vectors in-vivo in rodents
- Immunohistochemistry, confocal and fluorescence imaging

COMPUTER SKILLS

- Programming skills:

| | | |
|------------------------|-------------------------|--------------------------|
| R (experienced) | Matlab (average) | Python (beginner) |
|------------------------|-------------------------|--------------------------|
- Data analysis:
 - Time series and behavioral data, semi-automated video analysis
 - Linear models: ANOVA & ANCOVA, GLM, mixed Models.
 - Deep learning with Keras: DNN, CNN
 - Machine Learning with Tidymodels: random forests, decision trees, SVM
 - Shiny Dashboards
- Common Bash and AWS administration
- Specific interface programming language: Spike2 (CED) and Med-PC (Med Associates)
- Windows, Mac OS, Linux, simple administration using Bash
- Word, Excel, PowerPoint, Adobe Illustrator, GraphPad Prism, basics for CAD

PUBLICATIONS

1. **Tiran-Cappello A**, Vielle C, Brocard C, Pelloux Y, Degoulet M, Baunez C. A glimpse at deep brain stimulation mechanisms using subthalamic nucleus optogenetic manipulations (in review)
2. Degoulet M, **Tiran-Cappello A**, Combrisson E, Baunez C, Pelloux Y (2021) Subthalamic low frequency oscillations predict vulnerability to cocaine addiction. PNAS. (Accepted)
3. Pelloux Y, Degoulet M, **Tiran-Cappello A**, Cohen C, Lardeux S, George O, Koob GF, **Ahmed SH**, Baunez C (2018) Subthalamic nucleus high frequency stimulation prevents and reverses escalated cocaine use. Mol Psychiatry:1.
4. Koike Bruna Del Vechio; Farias Kelly Soares; Billwiller Francesca; Almeida-Filho, Daniel; Libourel Paul-Antoine; **Tiran-Cappello Alix**, Blanco Wilfredo; Ribeiro Sidarta; Luppi Pierre-Herve; Queiroz Claudio Marcos. (2017) Electrophysiological evidence that the retrosplenial cortex displays a strong and specific activation phased with hippocampal theta during paradoxical (REM) sleep. J Neurosci:0026-17.
5. McDevitt RA, **Tiran-Cappello A**, Shen H, Balderas I, Britt JP, Marino RAM, Chung SL, Richie CT, Harvey BK, Bonci A (2014) Serotonergic versus Nonserotonergic Dorsal Raphe Projection Neurons: Differential Participation in Reward Circuitry. Cell Rep 8:1857–1869.

Oral communications

- 2017 EWCBR - Arcs 1800 (France) - Manipulations of the subthalamic nucleus regulate motivation for sweet rewards: a comparison with electric high frequency stimulation data.

Posters

- 2019 **A Tiran-Cappello**, MD Bevan, SFN – Chicago (USA) - Basal ganglia output in the Q175 model of Huntington's disease
- 2017 **A Tiran-Cappello**, Y Pelloux, C Montanari, M Degoulet, C Baunez. OptoDBS – Geneva (Switzerland) – Optogenetically manipulating the motivation for sweet food in the subthalamic nucleus: a comparison with electric high frequency stimulation data
- A Tiran-Cappello**, Y Pelloux, C Montanari, M Degoulet, C Baunez. NeuroFrance – Bordeaux - Control of food motivation in rats by targeting the subthalamic nucleus with optogenetics
- 2016 **A Tiran-Cappello**, Y Pelloux, C Montanari, M. Degoulet, C Baunez. Society for neurosciences - San Diego (USA) - Optogenetic modulation of the subthalamic nucleus impairs the motivation for food in rats
- A Tiran-Cappello**, Y Pelloux, C Montanari, C Baunez. Optogenetic workshop – Paris (France) - Optogenetic stimulation of the subthalamic nucleus impairs the motivation for food in rats.
- 2015 **A Tiran-Cappello**, Y Pelloux, C Montanari, C Baunez. EBPS/EBBS meeting - Verona (Italy) - Optogenetic stimulation of the subthalamic nucleus impairs the motivation for food in rats
- A Tiran-Cappello**, Y Pelloux, C Baunez. Société des neurosciences – Montpellier (France) - Consequences of optogenetic stimulation in the subthalamic nucleus on the motivation for food

TEACHING EXPERIENCE

2014 – 2017 *Aix-Marseille University* - tutorials (180h) and general lectures (15h) to undergraduate students in neurobiology.

Student supervision

- 2018 Kayson Fahkar – Oldenburg University, De. – DREADD modulation of hyperdirect pathway on reward research
- 2017 Walid Idi - Licence 3, Aix-Marseille Université, Fr. – Recording of STN activity during motivational tasks
- Johana Vialard & Hinde Hasnaoui - Licence 3, Aix-Marseille Université, Fr. - Rodent behavioral handling and experimentation
- 2015 Denis Paris - Licence 3, Aix-Marseille Université, Fr. - Initiation to optogenetics.
- Feryel-Sanaa Benguedih & Lyamine Djebbar - Secondary students, MAAD researcher apprentices; Marseille, Fr. - 'STN, motivation and cocaine consumption.'

CONTACTS

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Dr. Kourrich Saïd (UQAM, Montreal, Canada)

saidkourrich@gmail.com