



Francesco Ceccarelli

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Date of birth:

Nationality:

Phone number:

Email address:

Address:

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WORK EXPERIENCE

 **DEPARTMENT OF PHYSIOLOGY AND PHARMACOLOGY VITTORIO ERSPAMER, LA SAPIENZA UNIVERSITY OF ROME – ROME, ITALY**

PHD IN BEHAVIORAL NEUROSCIENCE – 31/10/2018 – 31/01/2022

Thesis: Mixed and flexible temporal dynamic in macaque prefrontal cortex during strategy and associative tasks: contribution of putative pyramidal cells and interneurons

Supervisor: Prof. Aldo Genovesio

- Cortical extracellular recording in macaques
- Training and design of behavioral tasks of social interaction, associative learning, and home cage training for macaques.
- Management of stabled macaques
- Single cell and population analysis

 – ROME, ITALY

INTERNSHIP BEHAVIOURAL NEUROPHYSIOLOGY – 26/03/2017 – 30/10/2018

Behavioral Neurophysiology Lab, Department of Physiology and Pharmacology “Vittorio Erspamer”, University of Rome “Sapienza”, Supervisor Prof. Aldo Genovesio

During the period of my internship, I perform behavioural and electrophysiology experiments with human and non-human primates. I acquired the following skills and experiences for research:

- Programming skills with MATLAB for data analysis, the organisation of data, data mining, statistical analysis and data plotting.
- Programming skills with C language to develop, design and execution of neurophysiological and behavioural tasks with CORTEX.
- I develop a learning task (with Cortex) to study the different cognitive strategies in the individual and social learning. I enrolled the participants, collected and analysed the data.
- I contributed to building a new experimental set up composed by a touchscreen monitor, a reward system and Monkey Logic a MATLAB-based software tool used for the design and execution of psychophysical tasks.

 **DEPARTMENT OF PHYSIOLOGY AND PHARMACOLOGY VITTORIO ERSPAMER, LA SAPIENZA UNIVERSITY OF ROME – ROME, ITALY**

RESEARCH FELLOW (ASSEGNISTA DI RICERCA) – 01/08/2022 – 31/07/2024

Supervisor: Prof. Aldo Genovesio

Research Project HUMO ERC 2016 (2014) Grant Agreement 648734 titled “What is everybody doing? Social prediction, categorization, and monitoring in the Prefrontal Cortex of the Macaque adopting a new human monkey (H M) interactive paradigm”

EDUCATION AND TRAINING

12/05/2019 – 16/05/2019 Gottinga, Germany

RESEARCHER QUALIFIED TO WORK WITH NON-HUMAN PRIMATES FELASA: Laboratory Animal Course on Primates Accredited Course 057/17 German Primate Center

Primate Handling and Training

24/03/2014 – 30/09/2015 Rome, Italy

INTERNSHIP PSYCHOBIOLOGY AND PSYCHOPHARMACOLOGY

Laboratory of 'Developmental Psychobiology' Department of Psychology, University of Rome "Sapienza", Supervisor Prof.ssa Simona Cabib.

I have worked on animal models to develop my master's thesis. I acquired the following research skills:

- Gathering behavioural data with video tracking software EthoVision.
- Statistical analysis with SPSS and R software.

And I used the following Staining Techniques and Behavioral Tests:

- Porsolt Test (Forced Swim Test)
- Morris Water T-Maze
- Immunohistochemistry

30/09/2012 – 02/03/2017 Rome, Italy

MASTER'S DEGREE IN "COGNITIVE NEUROSCIENCE AND PSYCHOLOGICAL REHABILITATION"

Faculty of Medicine and Psychology "La Sapienza" of Rome.

Thesis: "A chronic stress condition produces a reversal learning deficit in mice characterised by genetic impulsivity",

Supervisor Prof.ssa Simona Cabib, Sapienza University.

Final Grade: 110/110

Level in EQF EQF level 7

30/09/2008 – 17/09/2012 Rome, Italy

BACHELOR'S DEGREE IN "SCIENZE E TECNICHE PSICOLOGICHE PER L'ANALISI DEI PROCESSI COGNITIVI NORMALI E PATOLOGICI"

Faculty of Medicine and Psychology "La Sapienza" of Rome.

Thesis: "Genetic polymorphisms and Cognition", Supervisor Prof.ssa Maria Teresa Fiorenza, Sapienza University.

Final Grade: 103/110

Level in EQF EQF level 6

2021 – 2021 Rome

SEMINARS ON LABORATORY ANIMAL WELFARE AND SCIENCE Sapienza University of Rome

2022 – 2022 Rome, Italy

TRAINING COURSE (D.M 5 AGOSTO 2021) ACCREDITED BY THE ITALIAN MINISTRY OF HEALTH

0024495-12/10/2022-DGSAF-MDS-P, PRECLINICAL TESTING AND ANIMAL WELFARE Sapienza University of Rome

- 1- National legislation
- 2- Ethics, animal welfare and the Three Rs (level 1)
- 3- Basic and appropriate biology – Mice; Non-human primates
- 4- Animal care, health and management – Mice; Rats; Non-human primates
- 5 -Recognition of pain, suffering and distress - Mice; Rats; Non-human primates
- 6- Humane methods of killing
- 7- Procedure minimamente invasive senza anestesia – Topi; Non-human primates
- 8 - Anaesthesia for minor procedures

LANGUAGE SKILLS

Mother tongue(s): **ITALIAN**

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
ENGLISH	C1	C1	C1	C1	C1

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

● RESEARCH-RELATED SKILLS

Experimental-related skills

- Software for Neurophysiology Monkey Logic and Cortex
- Training and extracellular recording with non-human primates
- Spike sorting
- Design and implementation of cognitive tasks (social, associative learning, home cage) for animal models

Data analysis-related skills

- Matlab languages (excellent knowledge)
- Python languages (basic knowledge)
- C/C++ languages (basic knowledge)
- SPSS (good knowledge) and R (basic knowledge)
- Machine learning decoding algorithms
- Classification of cell types via cell waveform analysis
- bootstrap statistic
- Analysis of Variance (ANOVA)
- Data visualization
- Data organization and curation for electrophysiology

General skills

- Office package (excellent knowledge)
- Adobe Illustrator (good knowledge)
- Window system (excellent knowledge)
- Ubuntu/Linux system (basic knowledge)
- ChatGPT

● PUBLICATIONS

2021

[**Macaque monkeys learn and perform a non-match-to-goal task using an automated home cage training procedure**](#)

Stefano Sacchetti , Francesco Ceccarelli , Lorenzo Ferrucci , Danilo Benozzo, Emiliano Brunamonti, Simon Nougaret, Aldo Genovesio; *Scientific reports*.

2022

[**Dedicated representation of others in the macaque frontal cortex: from action monitoring and prediction to outcome evaluation**](#)

Lorenzo Ferrucci Simon Nougaret, Rossella Falcone, Rossella Cirillo, Francesco Ceccarelli, Aldo Genovesio; *Cerebral Cortex*.

2022

[**Neural Representation of Others during Action Observation in Posterior Medial Prefrontal Cortex**](#)

Rossella Falcone, Rossella Cirillo, Francesco Ceccarelli, Aldo Genovesio; *Cerebral Cortex*.

2022

[**Social monitoring of actions in the macaque frontopolar cortex**](#)

Lorenzo Ferrucci, Simon Nougaret, Francesco Ceccarelli, Stefano Sacchetti, Valeria Fascianelli, Danilo Benozzo, Aldo Genovesio; *Progress in Neurobiology*.

2023

[**The transitive inference task to study the neuronal correlates of memory-driven decision making: A monkey neurophysiology perspective**](#)

Surabhi Ramawat, Isabel Beatrice Marc, Francesco Ceccarelli, Lorenzo Ferrucci, Giampiero Bardella, Stefano Ferraina, Pierpaolo Pani, Emiliano Brunamonti; *Neuroscience and Biobehavioral Reviews*.

2023

[Disentangling the identity of the Zona Incerta: a review of the known connections and latest implications](#)

Giulia Arena, Fabrizio Londei, Francesco Ceccarelli, Lorenzo Ferrucci, Elena Borra, Aldo Genovesio; *Ageing Research Reviews*

2023

[Static and dynamic coding in distinct cell types during associative learning in the prefrontal cortex](#)

Francesco Ceccarelli, Lorenzo Ferrucci, Fabrizio Londei, Surabhi Ramawat, Emiliano Brunamonti, Aldo Genovesio; *Nature Communications*.

2024

[Connecting the dots in the zona incerta: a study of neural assemblies and motifs of inter-area coordination in mice](#)

Fabrizio Londei, Giulia Arena, Lorenzo Ferrucci, Eleonora Russo, **Francesco Ceccarelli**, **Aldo Genovesio**; *iScience*

2024

[Neurons in the monkey frontopolar cortex encode learning stage and goal during a fast learning task](#)

Simon Nougaret, Lorenzo Ferrucci, Francesco Ceccarelli, Stefano Sacchetti, Danilo Benozzo, Valeria Fascianelli, Richard C. Saunders, Luc Renaud, Aldo Genovesio; *Plos Biology*

2025

[Home-Cage Training for Non-Human Primates: An Opportunity to Reduce Stress and Study Natural Behavior in Neurophysiology Experiments](#)

Francesco Ceccarelli, Fabrizio Londei, Giulia Arena, Aldo Genovesio, Lorenzo Ferrucci, *Animals*

2025

[Reward monitoring in the frontopolar cortex of macaques](#)

Lorenzo Ferrucci, **Francesco Ceccarelli**, Fabrizio Londei, Giulia Arena, Leyla Elyasizad, Simon Nougaret, Aldo Genovesio, *Scientific Reports*

2025

[Cell types implement multiple coding schemes in distinct prefrontal cortex areas during goal-directed behavior](#)

Francesco Ceccarelli, Lorenzo Ferrucci, Fabrizio Londei, Giulia Arena, Francesco Siano, Fabio Di Bello, Surabhi Ramawat, Satoshi Tsujimoto, Emiliano Brunamonti, Aldo Genovesio, *Progress in Neurobiology*

● **CONFERENCES AND SEMINARS**

23/09/2024 – 25/09/2024 Noto (SR), Sicily

Understanding Memory: Implications from neuronal to clinical populations

Francesco Ceccarelli, Symposium chair at XXX Congresso dell'Associazione Italiana di Psicologia - Sezione Sperimentale

23/09/2024 – 25/09/2024 Noto (SR), Sicily

Neural correlates of observational learning in the macaque dorsal premotor cortex during a human-monkey interactive associative task

Francesco Ceccarelli, speaker in Symposium titled: "Interacting with the world: from neurons to social behavior" at XXX Congresso dell'Associazione Italiana di Psicologia - Sezione Sperimentale

19/07/2024 – 19/07/2024 Italian reproducibility network (ITRN) Workshop Roma

Cell assembly-based assessment of brain-wide functional connectivity

F. Londei, G. Arena, F. Ceccarelli, L. Ferrucci, A. Genovesio

11/11/2023 – 15/11/2023 Society for neuroscience (Sfn), WASHINGTON

Neural Correlates of Observational Learning in the Macaque Dorsal Premotor Cortex during a Human-Monkey Interactive Associative Task

F. Ceccarelli, L. Ferrucci, S. Nougaret, F. Londei, G. Arena, A. Genovesio

11/11/2023 – 15/11/2023 Society for neuroscience (Sfn), WASHINGTON

Reconfiguration of the network activity during goal-action transformation in primate frontal cortex studied at the cell assembly level

F. LONDEI, F. CECCARELLI, G. ARENA, L. FERRUCCI, A. GENOVESIO

14/09/2023 – 17/09/2023 20th National Congress of the Italian Society for Neuroscience, Turin

Large-scale investigation of cell assembly coordination and network motifs in the mouse brain

Londei F.; Arena G.; Ceccarelli F.; Ferrucci L.; Genovesio A.

14/09/2023 – 17/09/2023 20th National Congress of the Italian Society for Neuroscience, Turin

Insights from the Zona Incerta: inter-area coordination assessed through cell assembly detection

Arena G.; Londei F.; Ceccarelli F.; Ferrucci, L.; Genovesio, A.

11/06/2022 – 11/06/2022 PHD MEETING IN NEUROSCIENCE, Italian society for neuroscience (SINS), Brescia

Characterization of cell assemblies and their organization in the macaque prefrontal cortex

F. Londei, F. Ceccarelli, G. Arena, L. Ferrucci, F. Di Bello, A. Genovesio

2021 – 2021 Società italiana di fisiologia (SIF)

STABLE AND DYNAMIC RESPONSE POPULATION CODING IN PREFRONTAL CORTEX

Francesco Ceccarelli, F. Londei, F. Di Bello, S. Ramawat, I. B. Marc, E. Brunamonti, A. Genovesio

2021 – 2021 Society for neuroscience (Sfn)

MAPPING OF STIMULUS-RESPONSE ASSOCIATIONS IN THE MACAQUE PREFRONTAL CORTEX: CONTRIBUTION OF PUTATIVE PYRAMIDAL CELLS AND INTERNEURONS

F. Ceccarelli, A. Genovesio

07/09/2021 – 09/09/2021 71st SIF National Congress The Italian Society of Physiology

Differences in task-difficulty encoding during logical decision-making in prefrontal and premotor cortical activity from non-human primates

S. Ramawat; I. B. Marc; M. Andujar; F. Ceccarelli; F. Londei; P. Pani; A. Genovesio; S. Ferraina; E. Brunamonti

07/09/2021 – 09/09/2021 71st SIF National Congress The Italian Society of Physiology

Failure of the race model accounting for inhibition in a stop signal selective task of upper and lower limb

Marc, I. B.; Ramawat, S.; Fiori, L.; Andujar, M.; Londei, F.; Ceccarelli, F.; Ferraina, S.; Brunamonti, E.

07/09/2021 – 09/09/2021 71st SIF National Congress The Italian Society of Physiology

Formation of cell assemblies in the prefrontal cortex of macaque monkeys during a distance and a temporal discrimination task

F. Londei; F. Ceccarelli; L. Ferrucci; S. Ramawat; I. B. Marc; A. Genovesio

2020 – 2020 Società italiana di neuroscienze (Sins)

Stable and dynamic coding in dorsolateral and frontal pole prefrontal cortex

F. CECCARELLI, L. FERRUCCI, S. NOUGARET, A. GENOVESIO