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| **BIOGRAPHICAL SKETCH** |
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| NAMEGiulio Pergola | POSITION TITLEAssistant Professor in Biological PsychologyLab Director - Brain Imaging, Networks and Data mining (Psychiatric Neuroscience Group, Bari) |
| eRA COMMONS USER NAME (credential, e.g., agency login)PERG\_NIH, UNIVERSITY OF BARI |
| EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)* |
| INSTITUTION AND LOCATION | DEGREE | MM/YY | FIELD OF STUDY |
| University of Bari Aldo Moro (UNIBA), Italy | M.S. | 07/2007 | Biology |
| International Graduate School of Neuroscience, Ruhr-Universität Bochum (RUB), Germany | Ph.D. | 11/2011 | Neuroscience |
| Neuroscience Area, International School for Advanced Studies (SISSA), Trieste, Italy | Postdoctoral training | 04/2013 | Cognitive Neuroscience |
| UNIBA, Bari, Italy | Habilitation: Associate Professorship | 04/2017 | Biological Psychology |
| UNIBA, Bari, Italy | Habilitation: Full Professorship | 11/2020 | Biological Psychology |

**A. Personal Statement**

I am interested in how brain and mind change. Development, experience, and aging affect our brain and ultimately define who we are. I study how genes, environment, and experience determine inter-individual variability. My current research focus is on schizophrenia. Our lab works to connect layers of biological systems from cells to brain circuits and behavior.

I obtained my PhD at RUB in Bochum (Germany; Marie Curie Early Stage Training) at the International Graduate School of Neuroscience, with the supervision of Prof. Daum and Prof. Suchan. I received additional training and funding by the RUB Research School and the German Academic Exchange Service (DAAD). A postdoc at the Italian excellence campus SISSA (Trieste, Italy) enriched my training in cognitive neuroscience.

Since May 2013, I have been assistant professor at UNIBA, in the Psychiatric Neuroscience Group of Prof. Alessandro Bertolino. Over the last years, I shifted my research focus from neuroimaging to functional genomics to investigate the neural substrates of cognitive and clinical inter-individual variability, especially with reference to schizophrenia. I aim to understand brain development and intermediate phenotypes of schizophrenia through gene co-expression network analysis and computational genetics.

Since November 2018, I have a double affiliation as director of the lab of Brain Imaging, Networks and Data mining at UNIBA and as visiting scientist at the Lieber Institute of Brain Development (LIBD) in Baltimore, MD. The prestigious Marie Curie fellowship I have obtained endowed UNIBA with a tenure-track professorship cofunded by the Italian Ministry of University and Research (the second professorship of this kind awarded in Italy). My long-term goal is to investigate the biology of inter-individual variability in healthy and pathological neurodevelopment.

1. **Positions and Honors**

**Positions and Employment**

2006-2007 Technical assistant, Department of Zoology, UNIBA

2008-2010 Marie Curie Early Stage Researcher (PhD student), Institute of Cognitive Neuroscience, RUB

2010-2011 Research associate, Department of Neuropsychology, RUB

2012-2013 Postdoctoral fellow, Neuroscience Area, SISSA

2013-2018 Assistant Professor in Psychiatry, Department of Basic Medical Science, Neuroscience and Sense Organs, UNIBA

2018- Tenure-track Assistant Professor in Biological Psychology, Department of Basic Medical Science, Neuroscience and Sense Organs, UNIBA

2018- Visiting Scientist in the Gene Networks unit of the LIBD

**Professional Experience**

2009-2010 Novobrain Conferences, RUB: “Mechanisms of cognition, learning, and memory”, co-organizer

2009 Scientific meeting at the International Graduate School of Neuroscience, RUB: “Involvement of the thalamus in declarative memory”, co-organizer

2010 Scientific meeting at the International Graduate School of Neuroscience, RUB: “Seekers of Emotion: Neuroscientific understanding of affective behaviour”, co-organizer

2013-2015 Acting coordinator of the WP3 for the IMAGEMEND European collaboration project (Grant Agreement Number: 602450). The PI of WP3 was Prof. Alessandro Bertolino, who was then on leave. I was also responsible for data management and statistical analysis for WP3

2014-2016 Technical advisor and director of the contract for the acquisition of a magnetoencephalography system at UNIBA

2016-2018 Coordinator, Professional Degree in Techniques of Psychiatric Rehabilitation. Department of Basic Medical Science, Neuroscience and Sense Organs, UNIBA

2016-2018 Coordination Panel Member, Residency in Psychiatry. Department of Basic Medical Science, Neuroscience and Sense Organs, UNIBA

2016- Lab Director, Brain Imaging, Networks, and Data mining. Psychiatric Neuroscience Group, UNIBA

2019 Conference “How the brain makes a difference” at UNIBA, organizer

2019- PhD Committee Panel Member, Doctoral School in “Applied Neuroscience”, UNIBA

**Professional Memberships**

2008-2011 Marie Curie Fellows Association – National Coordinator for Germany

2010-2014 Society for Neuroscience

2017- Società Italiana di Psicologia Fisiologica e Neuroscienze Cognitive (Italian Society for Physiological Psychology and Cognitive Neuroscience)

2017- Società Italiana di Neuropsicologia (Italian Society of Neuropsychology)

2018- Marie Curie Alumni Association

2019- European Scientific Association on Schizophrenia and other Psychoses

**Honors**

2008 **Marie Curie Early Stage Training** scholarship

2008 **DAAD fellowship**: “Neurocognition: Foundations and Clinical Processes” granting additional training and research allowance

2008 **RUB Research School fellowship** granting soft skill training and supplementary research allowance for the PhD

2008 **Travel grant, PENS-funded Summer School**: “The Neuroscience of Memory: Methods and Concepts to Investigate Our Internal Representation of the World” - Bangor, Wales, UK

2011 **International Brain Research Organization Alumni Poster Prize**

2012 **Travel Grant, Italian Prime Minister Cabinet** Workshop: “Campus Mentis”, Pomezia, Italy

2012 **Young SISSA Scientist award**

2015 **Boehringer-Ingelheim FONDS**, travel fellowship for a collaboration project at RUB

2017 **ICOSR Young Investigator Award** for participation in the 2017 meeting in San Diego (CA).

2017 **Seal of Excellence**, awarded by Marie Skłodowska-Curie Actions for scoring 91.8 % in the Global Fellowship funding program.

2017 **Young Scientist Award: best oral presentation** in the XXV meeting of the Italian Society of Psychophysiology and Cognitive Neuroscience.

2018 **Publons peer review award 2017.** Top 1% of peer reviewers in multidisciplinary fields.

2018 **Marie Skłodowska-Curie Global Fellowship**, grant for a 3-years project with tenure-track.

1. **Contributions to science**
2. I pioneered the investigation of eQTL polygenic scores indexing co-expression networks (co-eQTLs), so that I have been the first to study trans-eQTLs associated with gene co-expression. The findings are well-replicated in independent datasets and explain phenotypic variance in neuroimaging and clinical measures, offering novel insight relative to GWAS studies.
3. **Pergola G**, Di Carlo P, D'Ambrosio E, Scozia G, Pietrangelo B, Fazio L, Gelao B, Attrotto MT, Apud JA, Chen Q, Mattay VS, Rampino A, Caforio G, Weinberger DR, Blasi G, Bertolino A. (2017). *DRD2 Co-expression Network and a related Polygenic Score predict Phenotypes linked to Schizophrenia*. Translational Psychiatry 7(1):e1006. (PMID: 28094815).
4. Fazio L\*, **Pergola G\***, Papalino M, Di Carlo P, Monda A, Gelao B, Amoroso N, Tangaro S, Rampino A, Popolizio T, Bertolino A, Blasi G (2018). *The transcriptomic context of DRD1 is associated with prefrontal activity and behavior during working memory.* Proceedings of the National Academy of Sciences USA115(21):5582-5587*.* **\*equal contribution as first authors.** (PMID: 29735686)
5. **Pergola G\***, Di Carlo P\*, Jaffe AE, Papalino M, Chen Q, Hyde TM, Kleinman JE, Shin JH, Rampino A, Blasi G, Weinberger DR, Bertolino A. (2019). *Prefrontal co-expression of schizophrenia risk genes is associated with treatment response in patients.* Biological Psychiatry 86(1): 45–55 **\*equal contribution as first authors.** (PMID: 31126695)
6. Braun U, Harneit A, **Pergola G**, Menara T, Schaefer A, Betzel RF, Zang Z, Schweiger JI, Schwarz K, Chen J, Blasi G, Bertolino A, Durstewitz D, Pasqualetti F, Schwarz E, Meyer-Lindenberg A, Bassett DS, Tost H. (preprint). *Brain state stability during working memory is explained by network control theory, modulated by dopamine D1/D2 receptor function, and diminished in schizophrenia.* bioRxiv 679670; doi: 10.1101/679670
7. **Pergola G**\*, Rampino A\*, Di Carlo P, Marakhovskaia A, Quarto T, Fazio L, Papalino M, Torretta S, Amoroso N, Castro MN, Domenici E, Dukart J, Khlghatyan J, Monaco A, Popolizio T, Romano R, Sportelli L, Zunuer H, Blasi G, Beaulieu JM, Bertolino A. (preprint). A miR-137-related biological pathway of risk for Schizophrenia is associated with human brain emotion processing. bioRxiv 2020.08.03.230227; doi: 10.1101/2020.08.03.230227 **\*equal contribution as first authors.**
8. My studies contributed to reveal the role of thalamic nuclei in cognition and schizophrenia. I developed a methodology to map ischemic lesions onto specific thalamic nuclei and also applied it in functional studies with healthy controls and with patients with schizophrenia.
9. **Pergola G**, Ranft A, Mathias K, Suchan B (2013). *The role of the thalamic nuclei in recognition memory accompanied by recall during encoding and retrieval: an fMRI study.* Neuroimage 74:195-208. (PMID: 23435209).
10. **Pergola G**, Selvaggi P, Trizio S, Bertolino A, Blasi G. (2015). *The Role of the Thalamus in Schizophrenia from a Neuroimaging Perspective*. Neuroscience and Biobehavioural Reviews 54**:**57-75. (PMID: 25616183).
11. **Pergola G**, Danet L, Pitel AL, Carlesimo GA, Segobin S, Pariente J, Suchan B, Mitchell AS, Barbeau EJ. (2018). *The regulatory role of the human mediodorsal thalamus.* Trends in Cognitive Sciences 22(11): 1011–1025. (PMID: 30236489).
12. Antonucci LA,Di Carlo P, Passiatore R, Papalino M, Monda A, Amoroso N, Tangaro S, Taurisano P, Rampino A, Sambataro F, Popolizio T, Bertolino A, **Pergola G\***, Blasi, G\*. (2019). *Thalamic connectivity measured with fMRI is associated with a polygenic index predicting thalamo-prefrontal gene co-expression.* Brain Structure and Function 224(3): 1331–1344. **\*equal contribution as senior authors.** (PMID: 30236489).
13. I identified novel neuroimaging and environmental predictors of schizophrenia and mentored junior scientists in the functional characterization of multivariate schizophrenia signatures.
14. **Pergola G**, Trizio S, Di Carlo P, Taurisano P, Mancini M, Amoroso N, Nettis MA, Andriola I, Caforio G, Popolizio T, Rampino A, Di Giorgio A, Bertolino A, Blasi G. (2017). *Grey matter volume patterns in thalamic nuclei are associated with familial risk for schizophrenia.* Schizophrenia Research 180: 13-20. (PMID: 27449252).
15. **Pergola G**, Papalino M, Gelao B, Sportelli L, Vollerbergh W, Grattagliano I, Bertolino A. (2019). *Evocative gene-environment correlation between genetic risk for schizophrenia and bullying victimization.* World Psychiatry 18(3): 366-7. (PMID: 31496088).
16. Antonucci LA, **Pergola G**, Pigoni A, Dwyer D, Kambeitz-Ilankovic L, Penzel N, Romano R, Gelao B, Torretta S, Rampino A, Trojano M, Caforio G, Falkai P, Blasi G, Koutsouleris N, Bertolino, A. (2020) *A Pattern of Cognitive Deficits Stratified for Genetic and Environmental Risk Reliably Classifies Patients With Schizophrenia From Healthy Control Subjects.* Biological Psychiatry 87(8): 697–707. (PMID: 31948640).
17. Di Carlo P, **Pergola G**, Antonucci LA, Bonvino A, Mancini M, Quarto T, Rampino A, Popolizio T, Bertolino A, Blasi G. (2020). *Multivariate patterns of gray matter volume in thalamic nuclei are associated with positive schizotypy in healthy individuals.* Psychological Medicine 50(9): 1501–9. (PMID: 31358071).
18. Complete List of Published Work in MyBibliography: <http://www.ncbi.nlm.nih.gov/sites/myncbi/1h_BanbtKt5AH/bibliography/40451553/public/?sort=date&direction=descending>
19. Research Support

**Ongoing Research Support**

Research Programs of National Interest (Italy) Drago (PI) August 29th 2019 – February 28th 2023

“Dopamine - Dysbindin Genetic Interaction: a Multidisciplinary Approach To Characterize Cognitive Phenotypes of Schizophrenia and Develop Personalized Treatments”

*Dysbindin and dopamine D2R and D3R participate in the regulation of dopamine signaling that is key to the pathophysiology/treatment of schizophrenia. This project investigates interactions among dysbindin, D2R and D3R combining preclinical with imaging genetics studies in healthy controls and in patients with schizophrenia.*

Role: Co-PI Amount: EUR 80,000

NIH R21 Weinberger (PI) July 1st 2019 – June 30th 2021

“Temporal coherence of Schizophrenia risk genes in a critical brain circuit: It's about time”

*The goal of this study is to identify challenges and pitfalls of single cell population enriched RNA sequencing involved in the regulation of developmental trajectories of gene co-expression. We will study a hippocampo-prefrontal circuit to develop an algorithm library and laboratory protocols for data acquisition.*

Role: Co-PI Amount: USD 275,000 (+ indirects)

Marie Skłodowska-Curie Actions Pergola (PI) November 8th 2018 – November 7th 2021

“Identification of brain developmental gene co-expression networks to understand risk for Schizophrenia”

*The goal of this study is to identify developmental trajectories of schizophrenia risk gene co-expression. I will associate these genetic pathways with neuroimaging phenotypes relevant to schizophrenia.*

Role: Fellow Recipient and PI of the project Amount: EUR 262,000 (+ EUR 600,000 Ministry endowment)

**Completed Research Support**

Horizon 2020 – EU Funding Bertolino (PI) October 1st 2013 – September 30th 2017

“IMAGEMEND”

*This consortium aimed to identify the patient characteristics most relevant for treatment, derive biomarkers and decision rules from this systems-level dimensional account, and systematically validate biomarker panels in patient, high-risk and epidemiological samples to produce automated imaging-based diagnostic and predictive tests tailored for wide distribution throughout Europe in standard clinical settings.*

Role: Co-Investigator Amount: EUR 420,000

Fondazione Con Il Sud Bertolino (PI) May 2nd 2013 – March 31st 2017

“Development of a model for the staging of schizophrenia and for assessment of its impact on the outcomes of pharmacological and rehabilitative treatments”

*The goal of this study was to compare the effects of pharmacological and rehabilitative treatments in patients with schizophrenia.*

Role: Co-Investigator Amount: EUR 700,000

Hoffmann-La Roche Ltd. Pergola (PI) Jan 2nd 2015 – Dec 31st 2016

“Gene co-expression networks as roadmap for genotype to phenotype mapping in schizophrenia”

*This project aimed at using coexpression network analysis to reveal novel pharmacological targets for drug development and to study pharmacological treatment response in psychiatric patients stratified based on eQTL polygenic scores.*

Role: PI Amount: CHF 200,000

University of Bari Aldo Moro Pergola (PI) Mar 6th 2014 – Jan 5th 2016

“GRIN2B genetic variants are associated with cerebrovascular flow during working memory performance”

*This study, now published, was awarded a research allowance by the University of Bari to develop and validate genetic scores combining the effect of multiple eQTLs on GRIN2B expression. The GRIN2B genetic score has then been associated with the signal change in the prefrontal cortex during working memory performance.*

Role: PI Amount: EUR 3,300