

ALLEGATO B

UNIVERSITÀ DEGLI STUDI DI MILANO
selezione pubblica per n. 1 posto/i di Ricercatore a tempo determinato in tenure track (RTT)
per il gruppo scientifico-disciplinare 05/BIOS-14 - GENETICA ,
settore scientifico-disciplinare BIOS-14/A - Genetica
presso il Dipartimento di Bioscienze,
(avviso bando pubblicato sulla G.U. n. 99 del13/12/2024) Codice concorso 5672.

Alessandro Vitriolo
CURRICULUM VITAE

INFORMAZIONI PERSONALI (NON INSERIRE INDIRIZZO PRIVATO E TELEFONO FISSO O CELLULARE)

COGNOME	VITRIOLO
NOME	ALESSANDRO

TITOLI

TITOLO DI STUDIO

Master of Science, Bioinformatics, University of Milan Bicocca, 2013
Bachelor of Science, Biotechnology, University of Milan Bicocca, 2009

TITOLO DI DOTTORE DI RICERCA O EQUIVALENTI, OVVERO, PER I SETTORI INTERESSATI, DEL DIPLOMA DI SPECIALIZZAZIONE MEDICA O EQUIVALENTE, CONSEGUITO IN ITALIA O ALL'ESTERO

Systems Medicine, University of Milan La Statale, 29th January 2019.

CONTRATTI DI RICERCA, ASSEGNI DI RICERCA O EQUIVALENTI

2 years, (1 year assegno di ricerca signed in June 2023 and renewed in 2024, currently expected to expire in May 2025). University of Milan La Statale, Department of Oncology and Emato-Oncology, Prof. Testa Lab.

Post-doctoral contract from May 2020 to May 2023 with Telethon Foundation, to work at Human Technopole Foundation, University of Milan La Statale and European Institute of Oncology (IEO) for the lab of Prof. Testa.

1 year, Assegno di ricerca Oct 2018-Oct 2019, renewed up to Oct 2020, interrupted in the end of April 2020. University of Milan La Statale, Department of Oncology and Emato-Oncology, Prof. Testa Lab.

ATTIVITÀ DIDATTICA A LIVELLO UNIVERSITARIO IN ITALIA O ALL'ESTERO

- 2020-2025. **Adjunct professor**; Data Integration in Neurogenomics and Brain Disease modelling; (BIOLOGIA MOLECOLARE). **8 hours**.

Interuniversity MSc Bioinformatics Computational Genomics; University of Milan La Statale. **8 hours**.

- 2024. **Lecturer**; Profiling transcriptional regulation with next generation sequencing; BSc course in Biotechnology, University of Milan La Statale. **4 hours**.

- 2024. **Lecturer**; Neurogenomics approaches for translational medicine; 2nd Level vocational master, **Pharma Academy**, Naples. **10 hours**. University Federico II.

- 2023. **Lecturer**; Transcriptional Regulation in Neurodevelopment; 2nd Level vocational master; Master **Bioinformatics and Functional Genomics**; University of Milan La Statale. **4 hours**.

- 2020. **Lecturer**; Chromatin/Epigenetics, Computational Biology; 2nd Level vocational master; Master **Bioinformatics and Functional Genomics**; University of Milan La Statale. **4 hours**.

- 2019. **Lecturer**; Chromatin/Epigenetics, Computational Biology; 2nd Level vocational master; Master **Bioinformatics and Functional Genomics**; University of Milan La Statale. **4 hours**.

DOCUMENTATA ATTIVITÀ DI FORMAZIONE O DI RICERCA PRESSO QUALIFICATI ISTITUTI ITALIANI O STRANIERI

(inserire tipologia dell'attività, anno/anno accademico, ente, periodo, impegno in termini orari, ecc.)

- 2024. **Lecturer**; BrainOmics 2.0 - computational approaches for single-cell multiomics integration in neuroscience. Human Technopole. **8 hours**.

- 2022. **Lecturer**; BrainOmics - computational approaches for single-cell multiomics integration in neuroscience. Human Technopole. **8 hours**.

- 2015. **Lecturer**, 2nd Level vocational master; Bioinformatics, Structural Biology, Drug Design; Consorzio BioBresso. **32 hours**.

REALIZZAZIONE DI ATTIVITÀ PROGETTUALE

(indicare descrizione dell'attività, durata, eventuale ente a favore del quale è stata realizzata l'attività, ecc.)

2019-Current: Mechanistic dissection of molecular convergences within an integrative cohort of neurodevelopmental disorders.

2019-Current: Orthogonal perturbations of gene expression synthetically dissect the molecular underpinnings of modern humans' cortical development. (under submission)

2015-Current: Mechanistic dissection of Polycomb-dependent dysregulations in Weaver Syndrome neural lineages.

2020-2023. Single-cell multiomic dissection of electrophysiological correlates in Williams-Beuren- and 7q11.23 microduplication- Syndromes. Telethon Foundation. Won by Prof. Testa. GGP19226

2016-2023: Multiomic dissection of ADNP haploinsufficiency during cortical development. (under submission)

2016-2023: Molecular and functional dissection of YY1-dependent dysregulations in cortical development. (under revision)

2022-2023. Curation of causal interactions mediated by genes associated to autism accelerates the understanding of gene-phenotype relationships underlying neurodevelopmental disorders. (published)

2016-2021. KMT2D haploinsufficiency in Kabuki syndrome disrupts neuronal function through transcriptional and chromatin rewiring independent of H3K4-monomethylation. (under revision)

2016-2019. Dosage analysis of the 7q11.23 Williams region identifies BAZ1B as a major human gene patterning the modern human face and underlying self-domestication. (published)

ORGANIZZAZIONE, DIREZIONE E COORDINAMENTO DI CENTRI O GRUPPI DI RICERCA NAZIONALI E INTERNAZIONALI O PARTECIPAZIONE AGLI STESSI

Partecipazione a AUTISYN consortium and ADNPinMED project, FANTOM 6 consortium, Italian National Research Council (CNR) EPIGEN Flagship Project, e Spoke 9 RNA & Gene Therapy.

TITOLARITÀ DI BREVETTI

Peptides having TrkA-receptor-agonistic activity and/or peptides having NGF-antagonistic activity IT102016000086689A. Piercarlo Fantucci, Stefano Govoni, Alessia Angela PASCALE, Nicoletta MARCHESI, Emilio VANOLI, Jacopo VERTEMARA, Alessandro VITRIOLO

SELEZIONATA ATTIVITÀ DI RELATORE A CONGRESSI E CONVEGNI NAZIONALI E INTERNAZIONALI

Modelling human neurodiversity in a dish. Unlocking human brain complexity using 3D culture and single-cell omics. 13th 16th October. Capri. Poster

Dissecting the Convergent Molecular Pathways of Neurodevelopmental Disorders in 3D in vitro models. ISCCR. 10-13 July 2024. Hamburg. Poster

Disruption of ADNP-KDM1A-GTF2I complex drives neural differentiation defects in Helsmoortel-Van der Aa Syndrome. Second neurodevelopmental disorders conference: ADNP and more. Antwerp, 11th September 2024. **Invited Talk**

GTF2I dosage regulates neuronal differentiation and mice behaviour. Convegno Nazionale Associazione Persone Sindrome di Williams Italia. Marina di Massa. 13th May 2023. **Invited Talk**

The regulatory determinants of modern human brain development and evolution. EMBL Symposium: Brain genome: regulation, evolution, and function. Heidelberg. 26th April 2023. **Selected Talk**

Mapping the regulatory interactome of neocortical development to dissect modern human evolution. FANTOM6 Spring Meeting. Milan. 11th April 2023. Selected Talk

ADNP haploinsufficiency impairs progenitors proliferation and prevents direct differentiation in Helsmortel Van Der Aa Syndrome. HT seminars. Milan. 14th February 2023. Invited Talk

Chromatin remodelling dysregulation at the crossroad between neurodevelopmental disorders and human evolution. Neurodevelopmental Disorders Conference. Antwerp. 8th of September 2022. Invited Talk

Emerging insights on the modern human brain through the prism of neurodevelopmental disorders. FENS Forum 2022. Paris. 10th July 2022. Invited Talk

The decoupling of brain and face development in Homo sapiens through selection of epigenetic switches. EpiSyStem: Stem Cell Epigenetics International Conference. University of Milan. 4-6 July 2022 Selected Talk

KMT2D haploinsufficiency impairs synaptic activity and neuronal maturation through transcriptional and chromatin rewiring in Kabuki Syndrome human models. Neuroepigenetics: From Cells to Behaviour and Disease - Virtual. EMBO Workshop. 28 - 30 Oct 2020. Selected Talk

Neurodevelopmental disorders share modules of transcriptional dysregulation explaining brain and craniofacial-development associated phenotypes. 13th Troina Meeting on Genetics of Neurodevelopmental Disorders. Troina 12th-14th April 2018. Selected Talk

An integrative analysis of shared and unique molecular circuitries in patient-derived lineages from six neurodevelopmental disorders. A. Vitriolo, et al.. Troina, April 2017. 12th Meeting on Genetics of Neurodevelopmental Disorders. Selected Talk

From Williams Beuren Syndrome to several neurodevelopmental disorders and back. Contrasts and similarities harnessed with iPSCs, experimental and computational tools. April 2016. Troina (Italy). 11th Troina Meeting on Genetics of Neurodevelopmental Disorders. Selected Talk

The role of two conserved motif in the dynamics of E2 ubiquitin conjugating enzymes. Presented at the 3° Workshop "Metodi Computazionali per Processi Chimici e Biochimici". Vignale Monferrato (AL), Italy. 24-27 Sept, 2013. Selected talk

Homology modeling and molecular dynamics of P450 Cytochromes: a bioengineering project. 11th International Symposium on Cytochrome P450: Biodiversity and Biotechnology. Museo della Scienza e della Tecnica di Torino, June 22, 2012 Selected Talk

CONSEGUIMENTO DI PREMI E RICONOSCIMENTI NAZIONALI E INTERNAZIONALI PER ATTIVITÀ DI RICERCA

EMBO Exchange Grant (2024)

Fondazione IEO-CCM fellowship (2017)

SEMM European School of Molecular Medicine (2014-2018) fellowship

PRODUZIONE SCIENTIFICA

PUBBLICAZIONI SCIENTIFICHE

(per ciascuna pubblicazione indicare: nomi degli autori, titolo completo, casa editrice, data e luogo di pubblicazione, codice ISBN, ISSN, DOI o altro equivalente)

Preprints: co-last¹, co-first²

Published co-first³⁻⁷

Other relevant papers⁸⁻¹⁷

1. Pereira, M. F. et al. YY1 Mutations Disrupt Corticogenesis through a Cell-Type Specific Rewiring of Cell-Autonomous and Non-Cell-Autonomous Transcriptional Programs. <http://biorxiv.org/lookup/doi/10.1101/2024.02.16.580337> (2024) doi:10.1101/2024.02.16.580337. *in press in Molecular Psychiatry*
2. Gabriele, M. and Vitriolo A. et al. KMT2D haploinsufficiency in Kabuki syndrome disrupts neuronal function through transcriptional and chromatin rewiring independent of H3K4-monomethylation. 2021.04.22.440945 Preprint at <https://doi.org/10.1101/2021.04.22.440945> (2021).
3. Iannuccelli, M. and Vitriolo A. et al. Curation of causal interactions mediated by genes associated to autism accelerates the understanding of gene-phenotype relationships underlying neurodevelopmental disorders. *Molecular Psychiatry* 2024 Jan;29(1):186-196 DOI: 10.1038/s41380-023-02317-3 (2024).
4. Zanella, M. et al. Dosage analysis of the 7q11.23 Williams region identifies BAZ1B as a major human gene patterning the modern human face and underlying self-domestication. *Science Advances* **5**, eaaw7908 (2019). 10.1126/sciadv.aaw7908
5. Breglia, R. et al. Theoretical insights into [NiFe]-hydrogenases oxidation resulting in a slowly reactivating inactive state. *J Biol Inorg Chem*. 2017 Jan;22(1):137-151. doi: 10.1007/s00775-016-1416-1
6. Vitriolo, A., Gabriele, M. & Testa, G. From enhanceropathies to the epigenetic manifold underlying human cognition. *Hum. Mol. Genet.* (2019) doi:10.1093/hmg/ddz196.
7. Vitriolo A. et al. Tile by tile: capturing the evolutionary mosaic of human conditions. *Current Opinion in Genetics & Development* 90, 102297. doi.org/10.1016/j.gde.2024.102297
8. Germain, P.-L. et al. RNAontheBENCH: computational and empirical resources for benchmarking RNAseq quantification and differential expression methods. *Nucleic Acids Res.* **44**, 5054–5067 (2016).
9. Choufani, S. et al. DNA Methylation Signature for EZH2 Functionally Classifies Sequence Variants in Three PRC2 Complex Genes. *Am J Hum Genet* **106**, 596–610 (2020).
10. A multi-layered integrative analysis reveals a cholesterol metabolic program in outer radial glia with implications for human brain evolution. Juan Moriano, Oliviero Leonardi, Alessandro Vitriolo, Giuseppe Testa, Cedric Boeckx *Development*. 2024 Aug 15; 151(16): dev202390 10.1242/dev.202390

11. López Tobón, A. et al. The guanine nucleotide exchange factor Arhgef7/ β Pix promotes axon formation upstream of TC10. *Sci Rep* **8**, 8811 (2018).
12. Gabriele M and Vulto-van Silfhout et al. YY1 Haploinsufficiency Causes an Intellectual Disability Syndrome Featuring Transcriptional and Chromatin Dysfunction. *Am J Hum Genet.* 2017 Jun 1; 100(6): 907–925. 10.1016/j.ajhg.2017.05.006
13. D’Incal, C. P. et al. Chromatin remodeler Activity-Dependent Neuroprotective Protein (ADNP) contributes to syndromic autism. *Clinical Epigenetics* **15**, 45 (2023).
14. Caporale et al. Multiplexing cortical brain organoids for the longitudinal dissection of developmental traits at single-cell resolution. *Nat Methods* (2024). <https://doi.org/10.1038/s41592-024-02555-5>
15. Mihailovich, M. et al. 7q11.23 Multiscale modeling uncovers 7q11.23 copy number variation–dependent changes in ribosomal biogenesis and neuronal maturation and excitability. *J Clin Invest.* 2024 Jul 15; 134(14): e168982 10.1172/JCI168982
16. D’Incal, C.P., Cappuyns, E., Choukri, K. et al. Tracing the invisible mutant ADNP protein in Helsmoortel-Van der Aa syndrome patients. *Sci Rep* 14, 14710 (2024). 10.1038/s41598-024-65608-x
17. Andirkó, A., Moriano, J., Vitriolo, A. et al. Temporal mapping of derived high-frequency gene variants supports the mosaic nature of the evolution of *Homo sapiens*. *Sci Rep* 12, 9937 (2022). <https://doi.org/10.1038/s41598-022-13589-0>

FINANZIAMENTI e bandi vinti.

- 100000+ ore di calcolo CINECA (progetti “AMDAHL” e “AMDAHL 2”)
- EMBO Scientific Exchange Grant 2024

CONFERENZE ORGANIZZATE.

- ENABLE 2021 Milan 2021 EXPLORING LIFE DYNAMICS: In and out of equilibrium.
- Human Technopole PhD & Postdoc Symposium 2024.
- EMBL-HT Scientific Exchange Event 2024.

SCUOLE ESTIVE e di perfezionamento.

- "Lipari School on Computational Life Sciences - Jacob T. Schwartz International School for Scientific Research". Computational Drug Science and High-Precision Medicine. Lipari. Italy, July 2017
- Autumn School on Computational Approaches to Chromatin Organization Bedlewo. Poland, October 2016

COMPETENZE CHIAVE ACQUISITE E APPLICATE NEGLI ULTIMI 10 ANNI

- Bulk and single-cell data analysis of RNA- ATAC- ChIP-seq, CUT&Tag CUT&RUN, DNA methylation, Whole Exome and Whole Genome Sequencing
- Network analysis, gene-regulatory-network reconstruction

- CRISPR-based screening design and analysis
- Machine-learning and knowledge-base annotation of single-cell omics
- Integration of multiple omics modalities
- Development of advanced approaches to reconstruct differentiation trajectories
- Python and R programming
- Biostatistics
- Bash and IT management
- Versioning
- Containers

SOFT SKILLS

- mentoring
- teaching
- creativity
- problem solving
- decision making
- experimental design
- empathy
- communication
- teamwork
- leadership

PERSONE SUPERVISIONATE. *Ruolo ai tempi della supervisione (asterisco * indica supervisioni attualmente in corso)*

Bioinformatici e biologi computazionali

Daniele Capocefalo. *Post-doc*; Davide Castaldi. *PhD student*; Veronica Finazzi. *master student*; Francesco Dossena. *master student*; Francesco Morettini. *master student*; Mirco Macchi. *master student*; Camilla Tafuro. *master student*; Michelangelo Marasco. *medicine student*; Marina Fuster, *bachelor student* * (da Gennaio 2024); Filippo Prazzoli, *master student* * (da Aprile 2024).

Scienziati “ibridi” coinvolti sia in esperimenti che in analisi di dati bulk e single-cell
Oliviero Leonardi. *PhD student* * (da Ottobre 2022).

Scienziati con un ruolo principalmente sperimentale

Martina Pezzali. *PhD student* * (da Ottobre 2023); Marlene Pereira. *PhD student*

Data

13/01/2025

Luogo

Milano