

Curriculum Vitae: Clara A. MOREAU

Personal Information

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Born in Paris, France, Dec 9 - 1991 (French)

Education

2015 - 2020 **Ph.D. in Neurosciences, University of Montreal, Canada.**
Ranked as '*Exceptional thesis*' Advisors: Sébastien Jacquemont (Geneticist, Sainte Justine Hospital, UdeM) and Pierre Bellec (Psychology Department, SIMEXP lab, UdeM): Mapping genome-wide neuropsychiatric mutation effects on functional brain connectivity: Copy number variants delineate dimensions contributing to autism and schizophrenia
2012 - 2014 **Master's degree in Cognitive Sciences** (DEC, Cogmaster)
Descartes University & Ecole Normale Supérieure, Paris - France
2009-2012 **BSc degree in Psychology**; Descartes University, Paris-V France

Research experiences

2023 - current position. **Postdoctoral researcher**
Imaging Genetics Center, Keck School of Medicine, USC, Los Angeles, USA.
Advisor: Paul M. Thompson - Los Angeles, CA.
2021 - 2022 **Postdoctoral researcher** (2 years)
Human Genetics and Cognitive Functions Unit, Pasteur Institute, University of Paris, France
Advisor: Thomas Bourgeron
2014-2015 **Research Assistant** (1 year) Medical Genetics Department, Centre Hospitalier Universitaire Vaudois (CHUV), Lausanne, Switzerland
Advisor: Dr. S. Jacquemont.
Skills: MRI Protocol development and Scanning, Website development for family recruitment, neuropsychological assessment.
2019 **Internship** (2 months)- Imaging Genetic Center, USC, USA
Advisor: P.M. Thompson.
Skills: DTI analyses, ENIGMA CNV working group
2014 **Internship** (6 months) - Neurospin Institute, CEA, France.
Advisors: Marion Noulhiane & Lucie Hertz-Pannier (UNIACT)
Skills: fMRI analysis (SPM, Matlab) - Neurodevelopmental cohort.
2013 **Internship** (summer) - Neuroscience Department, University of Montreal, Canada
Advisor: Pr. P. Jolicoeur
Skills: MEG/EEG analyses for an auditory task.
2012 **Internship** (3 months) - Necker Children Hospital, INSERM – UMR 663 Paris, France.
Advisors: Pr. M. Noulhiane
Skills: Neuropsychological assessment and data analyses - Memory & Synesthesia
2012 **Internship** (summer) - Centre de Recherche en Neurosciences de Lyon.
Advisors: Pr. N. Ravel and Pr. R. Gervais
Skills: Recording olfactory cells in mice and signal processing

Teaching

2021: 'Neuroimagerie dans les troubles du spectre autistique' (for Psychiatrists, at R. Debré hospital)
2021: Moderator at the OHBM educational courses
2018-2020 (3 years): Teaching Assistant, Brain Imaging Techniques (UdeM, Pr. P. Bellec)
05.2018-06.2018: Instructor at the Brainhack School 2018 (Imaging genetics)

Students' supervision (n=9)

- 02.2021-08.2021: Main supervisor of P. Bergeret and L. Tran (Master internships in Bioinformatics, University of Paris Saclay).
06.2021-12.2021: Main supervisor of A. Debril (Psychiatrist, Master internship in Neuroscience, University of Paris Cité).
05.2021-12.2021: Main supervisor of L. Dry (Master internship - AgroParisTech)
04.2021-09.2021: Main supervisor S. Portalier (BSc–3rd year - Genetics “Magistère”, Paris)
07.2020-12.2021: Co-supervisor A. Harvey (Master internship - Informatics, DIRO, UdeM)
06.2019-12.2021: Co-supervisor A. Proulx (Master internship - Psychology, UdeM)
01.2019-07.2019: Main supervisor of G. Dumais (BSc–3rd year, Neurosciences, UdeM)
05.2016-08.2016: Main supervisor of A. Casgrain-Cyr (BSc–3rd year, Bioinformatics, UdeM)

Symposium / Invited lecture / Oral session

- 04.2023 **Society of Biological Psychiatry**, San Diego, USA
Oral Session: Brain abnormalities in early-onset anorexia
- 04.2023 **Semel institute, UCLA**
Invited lecture: Brain abnormalities in early-onset anorexia
- 02.2023 **7th Whistler Scientific Workshop on Brain Functional Organization, Connectivity**, Canada
Symposium on Clinical Applications
- 10.2022 **Institut de Neurosciences de la Timone**, Marseille France
Invited lecture “Impact of genetic heterogeneity and pleiotropy in psychiatry on brain functional connectivity”
- 07.2022 **British Association of Psychopharmacology** (London, UK)
Symposium: “Impact of genetic heterogeneity and pleiotropy in psychiatry on brain functional connectivity”
- 06.2022 **Human Brain Mapping**, (Glasgow, Scotland),
Oral session “Imaging Genetics: Mapping the Effects of Genetic and Transcriptional Variation on the Brain”
- 05.2022: **McGill University**, CA
Invited lecture: “Genetic heterogeneity and pleiotropy shape brain connectivity in psychiatry”
- 12.2021: Académie de Médecine de Paris, France
Seminaire “Troubles du neurodéveloppement sans frontière”
- 10.2021: **European Congress Neuropsychopharmacology**, Lisboa
Symposium: “The genetics of autism from risk to resilience”
- 05.2021: Les enjeux actuels en Neuroéducation (UQAM)
Seminaire “Que nous ont appris les dernières avancées en neuro-imagerie et génétique sur les troubles du spectre de l'autisme?”
- 04.2021: **Society of Biological Psychiatry**, virtual meeting
Symposium “Brain Alterations and Mechanisms in Carriers of Genomic Structural Variants”
- 06.2020 **Human Brain Mapping**, (virtual),
Symposium “Neuropsychiatric genetic variation shapes brain architecture by modulating gene expression”
- 03.2020: McGill University, Canada
Feindel BIC Lecture: “Neuropsychiatric mutations delineate functional brain connectivity dimensions contributing to autism and schizophrenia”.
- 08.2019: Imaging Genetic Center University of South California, USA
Invited lecture: “High-risk psychiatric mutations modulate functional brain connectivity pointing to dimensions involved in autism and schizophrenia”

06.2019 Human Brain Mapping, Rome

Symposium “A tough nut to crack: neurodevelopmental connectopathies.” (video online)

05.2019 Society of Biological Psychiatry, Chicago

Symposium “Large Scale Imaging Studies of Rare Copy Number variants: Brain Imaging from Enigma and Other Large-Scale International Studies” (link)

04.2019 International Society for Autism Research, Montreal

Symposium: “Human and Animal Models: Impact of High-Risk Copy Number Variants on Brain Structure, Functional Connectivity, and Sexual Development.”

Other scientific activities

Co-editor (special issue: “Combining Multimodal Brain Imaging Data for an integrated characterization of Neurodevelopmental Conditions”), Frontiers in Psychiatry (2021)

Peer reviewing: Brain, Communications Biology, Biological Psychiatry, Neuroimage, Neuropsychopharmacology, Molecular Autism

PhD committee of Dominika Slušná (University of Pompeu-Fabra, Barcelona, 2022)

Grant reviewing for the Agence National de la Recherche (ANR, France)

Awards

06.2021: Exceptional abstract of the year at the OHBM conference.

06.2020: Ph.D. ranked as an ‘*Exceptional thesis*’ and nominated for the *best thesis of the university*.

Personal grant and prices

2023: Co-leading the NIH R01 grant “The ENIGMA-Eating Disorders Initiative: A Global Neuroimaging Study of Anorexia and Factors Affecting Clinical Outcomes”

2023: Part of an NIH R01 grant “Global Neurogenetics Initiative”

09.2019: RBIQ Grant 15,000 \$CAD

08.2018: RBIQ Grant 5,000 \$CAD

11.2017: RBIQ Grant 3,000 \$CAD

06.2017: OHBM Travel award 500 \$USD

06.2016: OHBM Travel award 500 \$USD

Science Dissemination

11.2022: “De générations en générations, la recherche avance” Institut Pasteur Fundraising
Comprendre l’autisme et les troubles du neurodéveloppement

09.2022: IFM Young Researchers Day (Round Table)

05.2021: Simons Foundation Autism Research Initiative. Q&A with Sébastien Jacquemont and Clara Moreau: Why brain imaging signatures for autism are so elusive

11.2020: Simons Foundation Autism Research Initiative. Gene mutations point to overlaps in brain connectivity for autism, and schizophrenia.

06.2016: Brain imaging workshop co-organizer (Brainhack) with P. Bellec, Lausanne, Switzerland

2015-2016: Podcasts: “Psychiatric Conditions” and “Inside the Brain” (Neuroimaging techniques)

03.2014: Annual Cognitive Science Forum, Paris, France Symposium (organizer and moderator)
Cognition Humaine, Animale, Artificielle: continuité ou scission entre ces cognitions?

11. 2014: EPFL, CH Round Table Protecting Ideas, Liberating Innovation, and Open Collaboration

2014-2015: “Startup Weekend” workshops organizer and instructor for Ph.D. students (6 editions: Lausanne (EPFL), and Paris (ENS, CogInnov, and ESPCI)).

Publications (n=25, h-index = 15, citations = 621)

Scholar profile: https://scholar.google.com/citations?user=tkN9j_cAAAAJ&hl=en

ORCID: <https://orcid.org/0000-0001-6217-731X>

USC personal profile: <https://profiles.sc-ctsi.org/clara.moreau>

First Author (n=6)

- Moreau C**, Harvey A, Kumar K, Huguet G, Urchs SGW, Douard EA, *et al.* (2022): Genetic Heterogeneity Shapes Brain Connectivity in Psychiatry. *Biol Psychiatry*. <https://doi.org/10.1016/j.biopsych.2022.08.024>
- Moreau C**, Kumar K, Harvey A, Huguet G, Urchs S, Schultz LM, *et al.* (2022): Brain functional connectivity mirrors genetic pleiotropy in psychiatric conditions. *Brain*. <https://doi.org/10.1093/brain/awac315>
- Moreau C**, Ching CR, Kumar K, Jacquemont S, Bearden CE (2021): Structural and functional brain alterations revealed by neuroimaging in CNV carriers. *Curr Opin Genet Dev* 68: 88–98.
- Moreau C**, Raznahan A, Bellec P, Chakravarty M, Thompson PM, Jacquemont S (2021): Dissecting autism and schizophrenia through neuroimaging genomics. *Brain*. <https://doi.org/10.1093/brain/awab096>
- Moreau C**, Urchs SGW, Kuldeep K, Orban P, Schramm C, Dumas G, *et al.* (2020): Mutations associated with neuropsychiatric conditions delineate functional brain connectivity dimensions contributing to autism and schizophrenia. *Nat Commun* 11: 1–12.
- Moreau C**, Jean-Louis M, Blair R, Markiewicz CJ, Turner JA, Calhoun VD, *et al.* (2020): The genetics-BIDS extension: Easing the search for genetic data associated with human brain imaging. *Gigascience* . <https://doi.org/10.1093/gigascience/giaa104>

Under review / In preparation

- Moreau C**, Tran L, Ayrolles A, Bonicel R, Bergeret P, Traut N, *et al.* (2023): 50. Brain Abnormalities in Children With Early-Onset Anorexia. *Biol Psychiatry* 93: S90.
- Villalón-Reina J, **Moreau C**, Nir T, Romascano D, Maillard A, Jahanshad N, *et al.* (2023): 453. Diffusion tensor imaging white matter abnormalities associated with copy number variants: A normative modeling approach. *Biol Psychiatry* 93: S278.
- Lefebvre A, Traut N, Pedoux A, Maruani A, Beggiano A, Elmaleh M, **Moreau C**, Delorme R.. (2023): Putamen volume as a predictor of repetitive and restricted behaviors and interests related intensity in autism. *under review in Molecular Autism (co-last author)*

Co-authored (n=19)

- Rolland T, Cliquet F, Anney RJL, **Moreau C**, Traut N, Mathieu A, Huguet G, *et al.* Sub-diagnostic effects of genetic variants associated with autism. *Accepted in Nature Medicine* 2023
- Kumar K, Modenato C, **Moreau C**, Ching CRK, Harvey A, Martin-Brevet S, *et al.* Subcortical brain alterations in carriers of genomic copy number variants. *Accepted in American Journal of Psychiatry* 2023
- Kopal J, Kumar K, Saltoun K, Modenato C, **Moreau CA**, Martin-Brevet S, *et al.* (2023): Rare CNVs and phenome-wide profiling highlight brain structural divergence and phenotypical convergence. *Nat Hum Behav*. <https://doi.org/10.1038/s41562-023-01541-9>
- Floris DL, Peng H, Warrior V, Lombardo MV, Pretzsch CM, **Moreau C**, *et al.* (2023): The Link Between Autism and Sex-Related Neuroanatomy, and Associated Cognition and Gene Expression. *Am J Psychiatry* 180: 50–64.
- Modenato C, Kumar K, **Moreau C**, Martin-Brevet S, Huguet G, Schramm C, *et al.* (2021): Effects of eight neuropsychiatric copy number variants on human brain structure. *Transl Psychiatry* 11: 399.
- Ecker C, Pretzsch CM, Bletsch A, Mann C, Schaefer T, Ambrosino S, ..., **Moreau C**, *et al.* (2022): Interindividual Differences in Cortical Thickness and Their Genomic Underpinnings in Autism Spectrum Disorder. *Am J Psychiatry* 179: 242–254.
- Brownstein CA, Douard E, Mollon J, Smith R, Hojlo MA, Das A, ..., **Moreau C**, *et al.* (2022): Similar Rates of Deleterious Copy Number Variants in Early-Onset Psychosis and Autism Spectrum Disorder. *Am J Psychiatry* appiajp21111175.
- Modenato C, Martin-Brevet S, **Moreau CA**, Rodriguez-Herreros B, Kumar K, Draganski B, *et al.* (2021): Lessons learnt from neuroimaging studies of Copy Number Variants, a systematic review. *Biol Psychiatry*. <https://doi.org/10.1016/j.biopsych.2021.05.028>
- Sønderby IE, van der Meer D, Moreau C, Kaufmann T, Walters GB, Ellegaard M, ..., **Moreau C**, *et al.* (2021):

- 1q21.1 distal copy number variants are associated with cerebral and cognitive alterations in humans. *Transl Psychiatry* 11: 182.
- Douard E, Zeribi A, Schramm C, Tamer P, Loum MA, Nowak S, ..., **Moreau C, et al.** (2021): Effect Sizes of Deletions and Duplications on Autism Risk Across the Genome. *Am J Psychiatry* 178: 87–98.
- Bannier E, Barker G, Borghesani V, Broeckx N, Clement P, Emblem KE, ..., **Moreau C, et al.** (2021): The Open Brain Consent: Informing research participants and obtaining consent to share brain imaging data. *Hum Brain Mapp.* <https://doi.org/10.1002/hbm.25351>
- Sønderby IE, Ching CRK, Thomopoulos SI, van der Meer D, Sun D, Villalon-Reina JE, ..., **Moreau C, et al.** (2021): Effects of copy number variations on brain structure and risk for psychiatric illness: Large-scale studies from the ENIGMA working groups on CNVs. *Hum Brain Mapp.* <https://doi.org/10.1002/hbm.25354>
- Costalat G, Godin B, Balmain BN, **Moreau C**, Brotherton E, Billaut F, Lemaitre F (2020): Autonomic regulation of the heart and arrhythmogenesis in trained breath-hold divers. *EJSS* 1–19.
- Cárdenas-de-la-Parra A, Martin-Brevet S, **Moreau C**, Rodríguez-Herreros B, Fonov VS, Maillard AM, *et al.* (2019): Developmental trajectories of neuroanatomical alterations associated with the 16p11.2 Copy Number Variations. *Neuroimage* 203: 116155.
- Jøneh AE, Douard E, **Moreau C**, Van Dijck A, Passeggeri M, Kooy F, *et al.* (2019): Estimating the effect size of the 15Q11.2 BP1-BP2 deletion and its contribution to neurodevelopmental symptoms: recommendations for practice. *J Med Genet.* <https://doi.org/10.1136/jmedgenet-2018-105879>
- Urchs SGW, Tam A, Orban P, **Moreau C**, Benhajali Y, Nguyen HD, *et al.* (2022): Functional connectivity subtypes associate robustly with ASD diagnosis. *Elife* 11. <https://doi.org/10.7554/eLife.56257>
- van der Meer D, Sønderby IE, Kaufmann T, Walters GB, Abdellaoui A, Ames D, ..., **Moreau C, et al.** (2019): Association of Copy Number Variation of the 15q11.2 BP1-BP2 Region With Cortical and Subcortical Morphology and Cognition. *JAMA Psychiatry* 1–11.
- Sønderby IE, Gústafsson Ó, Doan NT, Hibar DP, Martin-Brevet S, Abdellaoui A, ..., **Moreau C, et al.** (2018): Dose response of the 16p11.2 distal copy number variant on intracranial volume and basal ganglia. *Mol Psychiatry.* <https://doi.org/10.1038/s41380-018-0118-1>
- Martin-Brevet S, Rodríguez-Herreros B, Nielsen JA, **Moreau C**, Modenato C, *et al.* (2018): Quantifying the Effects of 16p11.2 Copy Number Variants on Brain Structure: A Multisite Genetic-First Study. *Biol Psychiatry.* <https://doi.org/10.1016/j.biopsych.2018.02.1176>