

Sergio Andreu Sánchez

Location: Leuven

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POSTDOCTORAL RESEARCH COMPUTATIONAL BIOLOGY

I am a postdoctoral fellow at VIB Leuven, where I work in computational analyses of gut microbiome data. I have a background in computational biology, molecular biology and genetics. I have a keen interest in the application of omic technologies in health, particularly in the discovery of new biomarkers that can be used early diagnostics and treatment. My PhD work consisted on the exploration of multi-omics layers (mainly metagenomics, genetics and metabolomics), with the aim of identifying biomarkers related with immuno-senescence and cardiovascular disease.

TECHNICAL SKILLS

Languages : Python, R, bash
Data analysis : Univariate statistics, longitudinal data analysis, multivariate statistics, machine learning
Other : Snakemake, Django, Git

EXPERIENCE

Postdoctoral Fellow July 2024 –
Leuven, Belgium
Raes Lab, Flemish institute for Biotechnology (VIB)

- Human microbiome adaptation to human lifestyle and disease

PhD candidate January 2020 – June 2024
Groningen, The Netherlands
Groningen Microbiome Hub, University Medical Center Groningen

- May 2023 – September 2023 EMBO Visiting scholar at Nicola Segata group. Strain-resolved association study in over 30,000 metagenomes
- Large-scale epidemiological analyses using different omics techniques, particularly metagenomics, uncovering the aging of the immune system

Research assistant October 2019 – December 2019
Copenhagen, Denmark
Guojie Zhang lab, University of Copenhagen

- Continuation of MSc project after graduation. Working with NGS data from the Bird 10,000 Genome project

Part-time bioinformatician Oct 2018 – Sep 2019
Copenhagen, Denmark
Righospitalet

- Pipeline development for variant calling and different genetic diagnostic tasks
- Clinical microbiology. Tracking of microbial strains.

Part-time bioinformatician Dec 2017 – Nov 2018
Evaxion Copenhagen, Denmark

- Student assistant. Database management. Ad-hoc bioinformatic tasks

EDUCATION

University Medical Center Groningen Groningen, The Netherlands
Jan 2020 – June 2024
PhD in Comp. Biology (Cum laude)

University of Copenhagen Copenhagen, Denmark
Sep 2017 – Sep 2019
MSc in Bioinformatics

Technical University of Valencia Valencia, Spain
Sep 2012 – Jan 2017
BSc in Biotechnology

UNDERGRADUATE PROJECTS

MSc Thesis *Biodiversity Genomics Group. University of Copenhagen. Supervisor: Guojie Zhang*
Mitochondrial genomics, quantification and data analysis

MSc internship *Genomic Medicine. Rigshospitalet. Supervisor: Rasmus Lykke Marvig*
Strain analysis of post-surgical infections and air metagenomes

MSc internship *Center For Protein Research. University of Copenhagen. Supervisor: Søren Brunak*
Genetic determinants of disease comorbidity

BSc internship *Bioengineering Institute. Miguel Hernandez University. Supervisor: Jose Luis Micol-Molina*
Development of software for aiding mapping-by-sequencing

CONGRESSES

- 2023. The Human Microbiome (Heidelberg). Poster presentation.
- 2022. X Bioinformatics and Genomics Symposium (Valencia). Oral presentation.
- 2022. 9th Congress from the International Human Microbiome Consortium (Kobe). Poster presentation.
- 2022. 6th Translational Cardiovascular Research Meeting (Utrecht). Oral presentation.
- 2020. Word of Microbiome (online). Poster presentation.
- 2019. Congress European Society for Evolutionary Biology (Turku) . Poster presentation.

PRIZES & HONORS

- 2024. PhD awarded with *Cum laude* distinction (top 5%)
- 2023. EMBO Scientific Exchange Grant (10263) funding academic stay at Nicola Segata's group
- 2022. Simonsfonds funding for attendance of IHMC Kobe 2022
- 2021. JXTX Foundation scholarship for attendance of 2021 Cold Spring Harbor's Genome Informatics meeting
- 2016. Technical University of Valencia PROMOE scholarship for international stay in Tsinghua University
- 2012. High school completion with *Cum laude* distinction

SUPERVISION

- Supervision of two MSc students

OUTREACH

- Participation on Podcast *El Disfraz de Polifemo* (Spanish) [link](#)
- Interview in *Ciencias.com* (Spanish) [link](#)

REFERENCES

- Jingyuan Fu - PhD Supervisor j.fu@umcg.nl
- Alexandra Zhernakova - PhD Supervisor a.zhernakova@umcg.nl
- Rasmus Lykke Marvig - Supervisor during employment at Rigshospitalet rasmus.lykke.marvig@regionh.dk
- Josefin Stiller - Daily supervisor during MSc thesis josefin.stiller@bio.ku.dk

- Andreu-Sánchez, Sergio, Shahzad Ahmad, Alexander Kurilshikov, Marian Beekman, Mohsen Ghanbari, Martijn van Faassen, Inge CL van den Munckhof, Marinka Steur, Amy Harms, Thomas Hankemeier, et al. (2024). “Unraveling interindividual variation of trimethylamine N-oxide and its precursors at the population level”. In: *iMeta*, e183.
- Andreu-Sánchez, Sergio, Aida Ripoll-Cladellas, Anna Culinscaia, Ozlem Bulut, Arno R Bourgonje, Mihai G Netea, Peter Lansdorp, Geraldine Aubert, Marc Jan Bonder, Lude Franke, et al. (2024). “Antibody signatures against viruses and microbiome reflect past and chronic exposures and associate with aging and inflammation”. In: *Iscience* 27.6.
- Fernández-Pato, Asier, Trishla Sinha, Ranko Gacesa, Sergio Andreu-Sánchez, Milla F Brandao Gois, Jody Gelderloos-Arends, Dianne BH Jansen, Marloes Kruk, Martin Jaeger, Leo AB Joosten, et al. (2024). “Choice of DNA extraction method affects stool microbiome recovery and subsequent phenotypic association analyses”. In: *Scientific Reports* 14.1, p. 3911.
- Garmaeva, Sanzhima, Trishla Sinha, Anastasia Gulyaeva, Nataliia Kuzub, Johanne E Spreckels, Sergio Andreu-Sánchez, Ranko Gacesa, Arnau Vich Vila, Siobhan Brushett, Marloes Kruk, et al. (2024). “Transmission and dynamics of mother-infant gut viruses during pregnancy and early life”. In: *Nature Communications* 15.1, p. 1945.
- Ioannou, Magdalini, Jenny Borkent, Sergio Andreu-Sánchez, Jiafei Wu, Jingyuan Fu, Iris EC Sommer, and Bartholomeus CM Haarman (2024). “Reproducible gut microbial signatures in bipolar and schizophrenia spectrum disorders: A metagenome-wide study”. In: *Brain, Behavior, and Immunity*.
- Piperni, Elisa, Long H Nguyen, Paolo Manghi, Hanseul Kim, Edoardo Pasolli, Sergio Andreu-Sánchez, Alberto Arrè, Kate M Bermingham, Aitor Blanco-Míguez, Serena Manara, et al. (2024). “Intestinal Blastocystis is linked to healthier diets and more favorable cardiometabolic outcomes in 56,989 individuals from 32 countries”. In: *Cell*.
- Prins, Femke M, Valerie Collij, Hilde E Groot, Johannes R Björk, J Casper Swarte, Sergio Andreu-Sánchez, Bernadien H Jansen, Jingyuan Fu, Hermie JM Harmsen, Alexandra Zhernakova, et al. (2024). “The gut microbiome across the cardiovascular risk spectrum”. In: *European Journal of Preventive Cardiology* 31.8, pp. 935–944.
- Vochtelloo, Martijn, Patrick Deelen, Britt Vink, BIOS Consortium, Ellen A Tsai, Heiko Runz, Sergio Andreu-Sánchez, Jingyuan Fu, Alexandra Zhernakova, Harm-Jan Westra, et al. (2024). “PICALO: principal interaction component analysis for the identification of discrete technical, cell-type, and environmental factors that mediate eQTLs”. In: *Genome Biology* 25.1, p. 29.
- Zhernakova, Daria V, Daoming Wang, Lei Liu, Sergio Andreu-Sánchez, Yue Zhang, Angel J Ruiz-Moreno, Haoran Peng, Niels Plomp, Ángela Del Castillo-Izquierdo, Ranko Gacesa, et al. (2024). “Host genetic regulation of human gut microbial structural variation”. In: *Nature* 625.7996, pp. 813–821.
- Andreu-Sánchez, Sergio, Arno R Bourgonje, Thomas Vogl, Alexander Kurilshikov, Sigal Leviatan, Angel J Ruiz-Moreno, Shixian Hu, Trishla Sinha, Arnau Vich Vila, Shelley Klompus, et al. (2023). “Phage display sequencing reveals that genetic, environmental, and intrinsic factors influence variation of human antibody epitope repertoire”. In: *Immunity*.
- Andreu-Sánchez, Sergio, Jiafei Wu, and Jingyuan Fu (2023). “Beyond personal space: unveiling the transmission pattern of the human gut and oral microbiome”. In: *iMeta* 2.2.
- Bourgonje, Arno R, Sergio Andreu-Sánchez, Thomas Vogl, Shixian Hu, Arnau Vich Vila, Ranko Gacesa, Sigal Leviatan, Alexander Kurilshikov, Shelley Klompus, Iris N Kalka, et al. (2023). “Phage-display immunoprecipitation sequencing of the antibody epitope repertoire in inflammatory bowel disease reveals distinct antibody signatures”. In: *Immunity*.
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associates with cytokine production capacity in viral-suppressed people living with HIV". In: *Frontiers in Cellular and Infection Microbiology* 13.

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