Thomaz F S Bastiaanssen, PhD

Bioinformatics, Microbiome-Gut-Brain Axis, Theoretical Ecology, Medical Ecology

Curriculum Vitae

thomaz.bastiaanssen@ucc.ie
thomazbastiaanssen.github.io
Google Scholar - h-index: 23
ORCiD
@thomazsan

Professional Summary

I am a bioinformatician interested in the interplay between the gut microbiome and host mood and mental health. The focus of my research currently lies in understanding microbiome-gut-brain communication from a theoretical ecology/bioinformatics perspective. In particular, I am interested in understanding the role of stability and volatility of the gut microbiome in anxiety and depression and in integrating different types of 'omics data in a biologically interpretable manner. As a bioinformatician, I value clear and easily interpretable analysis of complex data in order to promote interdisciplinary collaboration.

Employment

2021 - Present **Postdoctoral Researcher**, *University College Cork*, Cork
Lead bioinformatician for the Cryanlab
- Awarded the '21/'22 APC Scientific Excellence award

Education

2018 - 2021 **PhD**, *University College Cork*, Cork
Thesis Title: Mining the Microbiome for Markers of Microbiota-Gut-Brain Communication and Mental Health
- Supervised by Prof. JF Cryan, Prof. TG Dinan and Dr. MJ Claesson

2014 - 2017 **MSc**, *Utrecht University*, Utrecht
Research Trajectory: Molecular and Cellular Life Sciences - Bioinformatics

2010 - 2013 **BSc**, *Utrecht University*, Utrecht
Majored in Biology with a Minor in Art History

Research Contributions

As a bioinformatician with a background in molecular biology, microbiology and theoretical ecology, I have contributed to the microbiome field and, most significantly, the microbiome-gut-brain axis field.
- I have developed a method to measure microbial volatility and have associated it with severity of the host stress response. Volatility is now studied in many microbiome fields.
- My microbiome bioinformatics guidebook has been used by several lecturers and research groups across many universities, both for research and educational purposes.
- I have developed and continue to maintain several free and open source bioinformatics and statistical analysis tools in the R programming language.

Mentorship

2022 - Present **Emma Todd**, *PhD candidate, Deakin University, Australia*
2021 - 2022 **Alessandro Atzeni**, *PhD candidate, University of Rovira i Virgili, Spain*
2021 - 2022 **Samuele Laudani**, *PhD candidate, University of Catania, Italy*
2019 - 2020 **Simon Spichak**, *MSc candidate, University College Cork, Ireland*

Research Skills

Academic: Study development • Mentoring • Grantsmanship • Scientific writing
Bioinformatics: 16S analysis • metagenomic shotgun analysis • RNAseq analysis • Metabolomics analysis • Microbiome functional inference • Volatility analysis • Multi-omics integration
General Programming: R • tidyverse • R package development • Python • Bash • Server management
Statistics: Experimental design • Data analysis • Generalised linear models • Generalised linear mixed effects models • Principal component analysis • Compositional data analysis • Mediation analysis

Honours & Awards

2021 - 2022 **APC Microbiome Ireland Scientific Excellence award**

Publications

Selected first author publications

2023 **Treating Bugs as Features: A compositional guide to the statistical analysis of the microbiome-gut-brain axis**, **TFS Bastiaanssen**, *TP Quinn, A Loughman*, arXiv

2021 **Microbiota from young mice counteracts selective age-associated behavioral deficits**, *M Boehme, KE Guzzetta,* **TFS Bastiaanssen**, *M Van De Wouw, ..., JF Cryan*, Nature Aging

2021 **Volatility as a Concept to Understand the Impact of Stress on the Microbiome**, **TFS Bastiaanssen**, *A Gururajan, M van de Wouw, GM Moloney, NL Ritz, ..., JF Cryan*, Psychoneuroendocrinology

2020 **Gutted! Unraveling the role of the microbiome in major depressive disorder**, **TFS Bastiaanssen**, *S Cussotto, MJ Claesson, G Clarke, TG Dinan, JF Cryan*, Harvard Review of Psychiatry

2019 **Making sense of ... the microbiome in psychiatry**, **TFS Bastiaanssen**, *CSM Cowan, MJ Claesson, TG Dinan, JF Cryan*, International Journal of Neuropsychopharmacology

Selected contributing author publications

2019 **The microbiota-gut-brain axis**, *JF Cryan, KJ O'Riordan, CSM Cowan, KV Sandhu,* **TFS Bastiaanssen**, *... TG Dinan*, Physiological reviews

2020 **Mid-life microbiota crises: middle age is associated with pervasive neuroimmune alterations that are reversed by targeting the gut microbiome**, *M Boehme, M van de Wouw,* **TFS Bastiaanssen**, *L Olavarría-Ramírez, ..., JF Cryan*, Molecular psychiatry

2019 **Preventing adolescent stress-induced cognitive and microbiome changes by diet**, *G Provensi, SD Schmidt, M Boehme,* **TFS Bastiaanssen**, *B Rani, A Costa, ..., MB Passani*, Proceedings of the National Academy of Sciences

2023 **Critical windows of early-life microbiota disruption on behaviour, neuroimmune function, and neurodevelopment**, *CMK Lynch, CSM Cowan,* **TFS Bastiaanssen**, *..., JF Cryan*, Brain, Behavior, and Immunity

Talks & Presentations

Selected Talks

2023 **Kronos: Circadian Rhythmicity Analysis in Microbiome and Other 'omics Datasets**, *Next Generation Bioinformatic Tools for Microbiome Research*, Invited panelist

2023 **Kronos: Circadian Rhythmicity Analysis in Microbiome and Other 'omics Datasets**, *Mind, Mood & Microbes*

2022 **How Microbes Drive Brain Disorders**, *Drug Discovery News Webinar*

2021 **The Brain-Body Connection**, *The Beyond Addiction Show Radio & Podcast*

Selected Poster Presentations

2018 **Don't push me cause I'm close to the edge: Stress-Induced Effects on the Stability of the Gut Microbiome in Mice**, *4th Intl Symposium on Resilience Research* Awarded Poster Prize