

Thomaz F S Bastiaanssen, PhD

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

Curriculum Vitae



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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-gutbrain 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

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 Cusotto, 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 Olavarria-Ramirez, ..., 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

- 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