

# Djordje Bajić

ASSISTANT PROFESSOR · DEPARTMENT OF BIOTECHNOLOGY · DELFT UNIVERSITY OF TECHNOLOGY

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## Positions

### Technical University Delft

ASSISTANT PROFESSOR

Delft, Netherlands

November 2022 - Present

### Yale University

POSTDOCTORAL ASSOCIATE

• Advisor: Dr. Alvaro Sanchez

New Haven, Connecticut, USA

Jul. 2016 - Jul. 2022

### Biological Research Center, Hungarian Academy of Science

RESEARCH ASSOCIATE

Szeged, Hungary

Feb 2015-Oct 2015

## Education

### Universidad Autonoma de Madrid

PHD BIOPHYSICS

• Advisor: Dr. Juan F. Poyatos

Madrid, Spain

Sep. 2010 - Feb. 2016

### Universidad Autonoma de Madrid

M.Sc. BIOPHYSICS

Madrid, Spain

Sep. 2009 - Sep. 2010

### Universidad Autonoma de Madrid

B.Sc. BIOCHEMISTRY

Madrid, Spain

Sep. 2003 - Sep. 2009

## Publications

\* shared first authorship; # co-corresponding authorship,

- [24] Diaz-Colunga, J.\*, Skwara, A.\*, Vila, J.C.C., Bajić D.# & Sanchez A.# 2024. *Global epistasis and the emergence of ecological function*. **Cell** (12), 3108-3119. e30
- [23] Vila, J.C.C.#, Goldford J, Estrela S., Bajić D., Sánchez-Gorostiaga A., Damian-Serrano A., Lu N., Marsland III, R., Rebolledo-Gómez M., Mehta P., & Sánchez A.# 2022. *Metabolic similarity and the predictability of microbial community assembly*. **biorxiv** <https://doi.org/10.1101/2023.10.25.564019>
- [22] Chang, C-Y.#, Bajić D.#, D., Vila, J.C.C., Estrela, S. Sánchez A.# 2022. *Emergent coexistence in multispecies microbial communities*. **Science** 381 (6655), 343-348
- [21] Takano S., Vila J.C.C., Miyazaki R., Sanchez A., Bajić D. *The architecture of metabolic networks constrains the evolution of microbial resource hierarchies* **Molecular Biology and Evolution** 40 (9), msad187
- [20] Scott W.T., Benito-Vaquerizo S., Zimmerman J., Bajić D., Heinken A., Suarez-Diez M, Schaap P.J. *A structured evaluation of genome-scale constraint-based modeling tools for microbial consortia* **PLoS Computational Biology** (in press)
- [19] Diaz-Colunga J., Skwara A., Gowda K., Diaz-Uriarte R., Tikhonov M., Bajić D., Sanchez A. *Global epistasis on fitness landscapes* **Philosophical Transactions of the Royal Society B** 378 (1877), 20220053

- [18] Sanchez A., Bajić D., Diaz-Colunga, J., Skwara, A., Vila, J.C.C. Kuehn S. 2022. *The community-function landscape of microbial consortia* **Cell Systems** 14 (2), 122-134
- [17] Estrela S.#, Vila J.C.C., Lu N., Bajić D., Rebolleda-Gomez M., Chang CY., Goldford J, Sanchez-Gorostiaga A., Sanchez A#. 2022. *Functional attractors in microbial community assembly*. **Cell Systems** S2405471221003793
- [16] Peralta-Marzal, Lucía N, Prince N, Bajić D., Roussin L, Naudon L, Rabot S, Garssen J, Kraneveld AD, and Perez-Pardo P. 2021. *The Impact of Gut Microbiota-Derived Metabolites in Autism Spectrum Disorders*. **International Journal of Molecular Sciences** 22, 18: 10052.
- [15] Dukovski I.\*, Bajić D.\*, Chacón J.M.\*, Quintin M\*., Vila J.C.C., Sulheim S., Pacheco A.R., Bernstein D., Korolev K., Sanchez A., Harcombe W.D., Segrè D. 2021. *A metabolic modeling platform for the computation of microbial ecosystems in time and space (COMETS)*. **Nature Protocols** 16, 5030–5082
- [14] Bajić, D.\*#, Rebolleda-Gomez M., Muñoz MM, Sanchez A#. 2021. *The macroevolutionary consequences of niche construction in microbial metabolism*. **Frontiers in Microbiology** 12:718082
- [13] Lino F.S.O., Bajić D., Vila J.C.C., Sanchez A., Sommer M.O.A. 2021. *Complex yeast-bacteria interactions shape the yield of industrial ethanol fermentations*. **Nature Communications** 12 (1), 1-12
- [12] Alonso-Lavin AJ, Bajić D., Poyatos J.F. 2021. *Tolerance to NADH/NAD<sup>+</sup> imbalance anticipates aging and anti-aging interventions*. **iScience** 102697
- [11] Kovács K.\*, Farkas Z.\*, Bajić D.\*, Kalapis D., Kintsés B., Notebaart R.A., Poyatos J.F., Kemmeren P., Holstege F.C.P., Pál C.#, Papp B#. 2020. *Suboptimal global transcriptional response increases the harmful effects of loss-of-function mutations in yeast*. **Molecular Biology and Evolution** msaa280
- [10] Chang C.\*, Osborne M.L.\*, Bajić, D. & Sanchez A. 2020. *Artificially selecting microbial communities using propagule strategies*. **Evolution** 74:10, 2392-2403 (<https://doi.org/10.1101/2020.05.01.066282>)
- [9] Bajić D. & Sanchez A. 2020. *The ecology and evolution of microbial metabolic decision-making*. **Current Opinion in Biotechnology**, 62:123–128.
- [8] Sanchez-Gorostiaga A.\*, Bajić D.\*, Osborne M.L., Poyatos J.F., Sanchez A. 2019. *High order interactions distort the functional landscape of microbial consortia*. **PLoS Biology** 17(12): e3000550
- [7] Bajić, D.\*#, Vila, J.C.C.\*, Blount, Z.D., Sanchez, A#. 2018. *On the deformability of an empirical fitness landscape by microbial evolution*. **Proceedings of the National Academy of Sciences, USA** 115(44):11286-11291
- [6] Goldford, J\*, Lu, N\*, Bajić, D., Estrela, S., Sanchez-Gorostiaga, A., Tikhonov, M., Segre, D., Mehta, P.#, Sanchez, A.#. 2018. *Emergent simplicity in microbial community assembly*. **Science** 361:469-74
- [5] Rodrigo G., Bajić D., Elola I., Poyatos J.F. 2017. *Deconstructing a multiple antibiotic resistance regulation through the quantification of its input function*. **NPJ Systems Biology and Applications** 3: Article number: 30
- [4] Rodrigo G., Bajić D., Elola I., Poyatos J.F. 2016. *Antagonistic autoregulation speeds up a homogeneous response in Escherichia coli*. **Scientific Reports** 6: Article number: 36196
- [3] Biología de sistemas. Book chapter in: Bioinformática con Ñ (editors: Sebastián A, Pascual-García A). 2014. Aguirre J., Bajić D., Guantes R. **Independently published**, ISBN:978-84-617-1976-X.
- [2] Bajić D., Moreno-Fenoll C., Poyatos J.F. 2014. *Rewiring of genetic networks in response to modification of genetic background*. **Genome biology and evolution** 6 : 3267–3280.
- [1] Bajić D., Poyatos J.F. 2012. *Balancing noise and plasticity in eukaryotic gene expression*. **BMC Genomics** 13: 343.

## Awards, Fellowships, & Grants

2015	Short-Term Fellowship, European Molecular Biology Organization	€ 7,940
2009	Master Scholarship, Universidad Autónoma de Madrid	€ 5,000
2008	Undergraduate Collaboration Scholarship, Spanish Ministry of Education	€ 2,700
2006	Erasmus Scholarship, European Commission	€ 3,500

## Selected Talks

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### INVITED TALKS AT MEETINGS AND CONFERENCES

- Feb 2025. **International Water Association: Innovative modelling approaches for microbial ecosystem engineering**, Online
- Oct 2024. **Principles in Cell Physiology Forum**, Online seminar
- May 2024. **Start up - Stand up event, Innovation Incubator Faculty of Biology**, Belgrade, Serbia
- Apr 2024. **Congress of Microbiologists Serbia - From Biotechnology to Human and Planetary Health**, Belgrade, Serbia
- Sep 2023. **2nd Dutch Symposium on Quantitative Microbial Ecology**, TU Delft, Delft, The Netherlands
- Sep 2023. **Joint NLSEB/BioSB symposium on Evolution in and of cell communities**, Amsterdam, The Netherlands
- Sep 2023. **ICGEB Workshop on Trends in Microbial Solutions for Sustainable Agriculture**, Belgrade, Serbia
- Apr 2022. **Principles in Cell Physiology Forum**, Online seminar

### INVITED DEPARTMENT SEMINARS

- Feb 2025. **Centro de Biotecnología y Genómica de Plantas (CBGP Seminar Series)**, Madrid, Spain
- Dec 2023. **Wageningen Evolution and Ecology Seminars**, Wageningen, The Netherlands
- Nov 2023. **International Forum @ Nanjing Agricultural University**, Online seminar
- Feb 2023. **Department of Pharmacology, Utrecht University**, Utrecht, Netherlands
- Dec 2022. **Section of Industrial Microbiology, Department of Biotechnology, Technical University of Delft**, Delft, The Netherlands
- Oct 2022. **Biological Research Center, Hungarian Academy of Sciences**, Szeged, Hungary
- Jun 2020. **Max Planck Institute for Evolutionary Biology Seminar Series**, Plön, Germany
- Jul 2019. **"Impact of horizontal gene transfer on natural microbiomes" HFSP Project Meeting**, Tokyo, Japan.
- Mar 2019. **COMETS Hackathon**, Boston University, Boston, USA
- Mar 2019. **"Impact of horizontal gene transfer on natural microbiomes" HFSP Project Meeting**, Lausanne, Switzerland.
- Mar 2018. **SMAL Talk**, Yale University, New Haven, USA
- Dec 2017. **Department Seminar**, Ramon y Cajal University Hospital, Microbiology Research Unit, Madrid, Spain
- Dec 2013 **XXI National Center for Biotechnology Scientific Workshop**. CNB-CSIC, Madrid, Spain

### CONTRIBUTED TALKS AT MEETINGS AND CONFERENCES

- Jul 2024. **European Conference on Biotechnology**, Rotterdam, The Netherlands
- Jan 2024. **Microbial Ecology and Evolution Hubs (MEEHubs24) Conference**, Online talk
- Jun 2021. **EMBO Predicting Evolution Workshop**, Heidelberg 2021 (Online talk)
- Oct 2020. **bioSB2020 - 6th Bioinformatics & Systems Biology Conference**, Netherlands, 2020 (Online)
- Jun 2018. **Wellcome Trust Conference on Evolutionary Systems Biology**, Hinxton, UK, 2018

## Teaching Experience

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### TU DELFT

- LM3432      Analysis of Metabolic Networks. Coordinator. 1 quarter, 8h/week (6 ECTS), 2022–present

## INVITED LECTURER

2024, 2025. Invited Lecturer, Advanced Course on Microbial Physiology and Fermentation Technology, **TU Delft**, 3 hr

2018. Invited Lecturer, Course: Evolutionary Biology (EEB225), **Yale University**, 1 hr

2012. Guest Lecture. Master in Biomedicine, **Universidad Autonoma de Madrid**, 2 hr

## Mentoring

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### AT TU DELFT

2023-2027 **Uroš Gojković**, PhD Student

2023-2027 **Minke Gabriëls**, PhD Student

2023 - **4 Master End Projects (9 mo. each)**,

2023 - **5 Bachelor End Projects (3 mo. each)**,

2024 - **1 ERASMUS Master Internship (4 mo.)**,

### AT YALE

2019-2020 **Sotaro Takano**, Visiting postdoc (6 mo), co-supervised project (1 paper together)

2019 **Felipe Lino**, Visiting PhD Student (4 mo), co-supervised project (1 paper together)

2016-2022 **Jean C.C. Vila**, PhD Student, co-supervised Thesis (EEB, Yale University)

2019-2020 **Madeline Bender**, Co-directed Senior Thesis, EEB, Yale University (1 paper in prep.)

## Professional Service

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### COMMISSIONS OF TRUST

2020 **NASA**, Panel Member for Grant Evaluation - Exobiology Solicitation

2022 **UK Research and Innovation**, External Reviewer for "NERC Highlight Topics" Grant

2023 **Swiss National Science Foundation**, External Reviewer for SNF Consolidator Grant

2023 **Wageningen University & Research**, Member of PhD committee

### MEETING AND COURSE ORGANIZATION

2024 - **Advanced course "Multi-Omics approaches for Improvement of Industrial Microbes"**, Board Member. Delft, The Netherlands.

2024. **Session on "Structure and Function of Microbial Communities", KNVM Spring Meeting**, Co-convenor with Matti Gralka. Arnhem, The Netherlands.

2023. **II Dutch Symposium on Quantitative Microbial Ecology**, Co-organization with Rebeca González-Cabaleiro.

2023. **Zero emission Biotechnology Industry Day**, Member of Organizing Committee. TU Delft, Delft, The Netherlands.

### REVIEWER FOR SCIENTIFIC JOURNALS

Science Advances, PLoS Biology, Nature Communications, eLife, Nature Ecology and Evolution, Genome Biology, ISME Journal, PLoS Computational Biology, BMC Systems Biology, Proceedings of the Royal Society B: Biological Sciences, Proceedings of the Royal Society: Interface, mSystems