Q1. With which university or research institute in the Netherlands are you affiliated?

* VU: 3
* UvA: 6
* UL: 3
* RU: 5
* UU: 1
* Naturalis: 4
* Erasmus MC: 7
* TU Delft: 1
* ACTA: 2
* AUC: 1
* NIOZ: 9
* WUR: 2
* RUG: 2

Q2. If you would have to give yourself a label as a researcher within the field of biology, which label would you use?

* Taxonomist 2x
* Palaeontologist
* Evolutionary biologist 2x
* Evolutionary psychologist
* Evolutionary systems biologist
* Ecologist 3x
* Aquatic ecologist
* Dispersal ecologist
* Population ecologist
* Theoretical ecologist 2x
* Behavioural ecologist
* Movement ecologist 2x
* Marine ecologist 4x
* Microbial ecotoxicologist
* Ecophysiologist
* Animal physiologist
* Plant physiologist
* Botanist
* Immunologist
* Clinical immunologist
* Biomedical researcher
* Oncologist 2x
* Forensic epigeneticist
* Cell biologist 2 x
* Molecular biologist
* Biochemist
* Synthetic biologist
* Mechanobiologist
* Computational neuroscientist
* Neurobiologist
* Bioethicist / Philosopher
* Statistician

Q3. What is in your opinion the most important theoretical framework within your line of research?

* The Cytoskeletal Framework
* Signal Transduction Pathways
* Biochemical systems
* Biochemical Cycling
* Bottom-up & top-down construction of minimal cells
* Genetic engineering
* Protein-Protein Interaction
* "Life is maintained by cells that are bags of water compartmentalized by membranes, in which chemical reactions catalyzed by enzymes take place."
* DNA-RNA-protein paradigm
* DNA methylation is involved in transcriptional regulation
* The central dogma
* Mass Conservation
* Mechanobiology
* Ecology 2x
* Population dynamic models
* Unifying gravity framework for dispersal
* Population viability analysis
* Optimal foraging theory
* Movement ecology paradigm (R Nathan 2008)
* Ecosystem Dynamics
* Movement Ecology Framework / Paradigm 2x
* Spatio-temporal organisation
* Dynamic Energy Budget Theory
* Species-Area relationships
* Ecological niche theory
* Consumer-resource interactions
* Evolution 7x
* Eco-evolutionary dynamics 2x
* Continental Drift
* Adaptations by Human Induced Rapid Evolutionary Change (HIREC)
* Evolution by natural selection 2x
* Inclusive fitness theory
* Mendelian laws
* Phylogenetic reconstruction
* Phylogenetics
* Functional redundancy
* ABC model for floral shape
* Biological traits
* The interface between genetical and environmental influences on human behavior
* Interplay between the genetic, behavioral, and environmental
* Alternative stable states
* Biophysical modelling of neural activity
* Functional modelling to decode neural signals
* Statistical physics, such as mean field approximations
* Neutral theory
* Statistical modelling
* Epilepsy as a multifactorial disease caused by brain networks disturbance
* Actor-network theory
* Constellation framework
* Anticipatory governance
* Immunology 2x
* Hematology
* Hallmarks of Cancer
* Creativity
* Hypotheses 3x
* The Anthropocene

Q4. State to what extent you agree with the following statements:

* Everything can be solved if you think about it long enough, M = 2.30, SD = 1.22
* Theories are most valid when they have a practical application in the world M = 2.95, SD = 1.24
* Theories can be somewhat general in order to describe reality properly M = 3.93, SD = 0.86
* Science can explain everything in the universe M = 3.00, SD = 1.43

Q5. What are the research methods / sampling methods / tools you use for collecting data / conducting your research?

* Laboratory work: 28
* Models: 30
* Working / sampling in the field: 19
* Logic and argumentation: 20
* Meta-analysis: 12
* Interviews and / or questionnaires: 5
* Other, namely:
  + Focus groups / dialogues
  + Taxonomy
  + Bioinformatics
  + Mesocosm experiments 2x

Q6. With which data analysis methods do you work the most?

* GLMM (generalized linear mixed models) 6x
* GLM (generalized linear models) 4x
* LM (linear models) 5x
* LRM (linear regression models) 2x
* NLRM (non-linear regression models)
* Logistic regression models 2x
* RM (regression models) 2x
* MR (multiple regression)
* Mixed models 2x
* Generalized Additive Models 2x
* Multivariate statistics
* Akaike Information Criterion (AIC)
* Bayesian inference
* Likelihood ratio tests
* Bootstrap
* Random forests 2x
* ANOVA 3x
* t-test 2x
* Simple/standard statistics 2x
* Null hypothesis significance testing
* Multi-dimensional scaling
* Time series analysis
* Shannon information theory
* Mean field approximations
* Network analysis
* PCA (principal components analysis) 3x
* DNA sequencing analysis (alignment, mapping) 3x
* Microscopy analysis 2x
* Qualitative molecular analysis
* Protein expression analysis (e.g. Western blot)
* Gene expression analysis 2x
* Transcriptomic analyses
* DeltaCq (ΔCq) analysis
* Dynamical systems 2x
* Bifurcation analysis
* Species Distribution Models 3x
* Mechanistic Ecosystem Models
* Reactive Transport Models
* Spatial-temporal autocorrelation
* Spatial analysis
* Occupancy models
* Integrated population models
* Palaeoenvironmental analyses
* Survival models
* Structural equation modelling (SEM)
* Thematic analysis (combination of deductive and inductive coding)
* DELPHI analysis
* Fixation index (Fst)
* R 3x
* Fiji
* deseq2

Q7. Which disciplines are the most important in your research?

* Biology, M = 1.20, SD = 0.61, min = 1, max = 4
* Computer sciences, M = 3.8, SD = 1.86, min = 1, max = 8
* Mathematics, M = 4.05, SD = 1.80, min = 1, max = 9
* Chemistry, M = 4.12, SD = 2.11, min = 1, max = 9
* Physics, M = 5.10, SD = 2.09, min = 2, max = 9
* Philosophy combined score: M = 6.67, SD = 1,07
  + Philosophy: Logic, M = 5,45, SD = 1.78, min = 2, max = 9
  + Philosophy: Ethics, M = 6.23, SD = 1.97, min = 1, max = 9
  + Philosophy: Epistemology, M = 7.25, SD = 2.12, min = 3, max = 9
  + Philosophy: Metaphysics, M = 7.75, SD = 1.24, min = 4, max = 9

Q9. If you look at your research field, which topics or skills are not taught or addressed (enough) in university education?

* omics/large data set analysis
* Any quantitative skill (data validation, data set construction, (chemical) calculations, statistical analysis)
* data analysis
* Data modelling
* Applied data analysis
* Writing and implementing statistical knowledge
* Big data handling and analysis
* Data management
* Statistics 4x
* Hands on experience with state of the art techniques (optogenetics/chemogenetics/crispr-cas etc)
* Critical thinking: non-conventional thinking of methodology, often the same methods are constantly used without thinking if the methods actually work for the line of research.
* Connections between theory, practice and skills
* Leadership
* How to deal with supervisors
* How to plan and prepare for lab experiments
* How to read the papers that have led to discoveries / the " how do we know" question: information comes from real experiments
* Protein (function) and nuclei acid detection techniques
* Logical thinking
* Creativity
* Perseverence
* STEM (Science, Technology, Engineering, Mathematics) skills
* Individual-based modelling
* Computational biology
* Applied programming 3x
* How to formulate relevant and mechanistic process models (ecolgoical, biological)
* Mathematics
* Ecological modelling 2x
* Computer science
* Recognizing main groups of organism
* Knowing basic ecology of main group of organism
* Movement ecology
* Macro-ecological patterns
* Cross-species patterns
* Ecological analysis
* Ecological theories
* Philosophy
* Ethics
* Multistakeholder collaboration
* Responsible research & innovation (implementation theory)
* Engagement with local communities / incorporation of local knowledge
* Evolutionary cognitive science
* DNA methylation

Optional question. If you look back at what you have been taught as a student, which topics / courses / information have you never had to use in your line of work?

* I think I use everything 5x
* Mathematics 4x
* Cosmology
* Orbitals
* Fermentation
* Biotechnology
* Toxicology
* Fungal biotechnology
* System (micro)biology
* Plant systematics
* Plant physiology 2x
* Animal morphology
* Anatomy 2x
* Botany
* Taxonomy
* Forestry and resource management
* Sustainable utilization
* Data presentation
* Critical thinking
* How best to engage with local communities
* Biochemistry 2x
* Cell biology
* Krebs cycle by heart in every detail
* Philosophy

Q8. What have been the most important research papers in your field of research in the past three years (published in 2022 or later)?

* Douglas et al. 2022 Social pharmaceutical innovation and alternative forms of research, development and deployment for drugs for rare diseases https://pubmed.ncbi.nlm.nih.gov/36064440/
* van Baalen & Boon 2024 Understanding disciplinary perspectives: a framework to develop skills for interdisciplinary research collaborations of medical experts and engineers https://bmcmededuc.biomedcentral.com/articles/10.1186/s12909-024-05913-1
* Groot & Abma 2022 Ethics framework for citizen science and public and patient participation in research <https://bmcmedethics.biomedcentral.com/articles/10.1186/s12910-022-00761-4>
* https://doi.org/10.1037/amp0000849
* https://doi.org/10.1371/journal.pbio.3002311
* https://doi.org/10.1002/wps.21072
* <https://doi.org/10.3389/fpsyt.2022.763380>
* doi: 10.1016/j.cell.2024
* Sébastien Duperron Sébastien Halary Alison Gallet Benjamin Marie 2020 Microbiome-Aware Ecotoxicology of Organisms: Relevance, Pitfalls, and Challenges <https://doi.org/10.3389/fpubh.2020.00407>
* 10.1098/rstb.2022.0502
* 10.32942/X2GG62
* 10.1038/s41598-023-44012-x
* Restoring shallow lakes impaired by eutrophication: Approaches, outcomes, and challenges; Abell et al, 2022; <https://doi.org/10.1080/10643389.2020.1854564>
* Chavlis, S., & Poirazi, P. (2025). Dendrites endow artificial neural networks with accurate, robust and parameter-efficient learning. Nature Communications, 16(1), 943. https://doi.org/10.1038/s41467-025-56297-9
* Gast, R., Solla, S. A., & Kennedy, A. (2024). Neural heterogeneity controls computations in spiking neural networks. Proceedings of the National Academy of Sciences, 121(3), e2311885121. https://doi.org/10.1073/pnas.2311885121
* Vinograd, A., Nair, A., Kim, J. H., Linderman, S. W., & Anderson, D. J. (2024). Causal evidence of a line attractor encoding an affective state. Nature, 1–9. https://doi.org/10.1038/s41586-024-07915-x
* Tlaie, A., Shapcott, K., Plas, T. L. van der, Rowland, J., Lees, R., Keeling, J., Packer, A., Tiesinga, P., Schölvinck, M. L., & Havenith, M. N. (2024). What does the mean mean? A simple test for neuroscience. PLOS Computational Biology, 20(4), e1012000. https://doi.org/10.1371/journal.pcbi.1012000
* Timcheck, J., Kadmon, J., Boahen, K., & Ganguli, S. (2022). Optimal noise level for coding with tightly balanced networks of spiking neurons in the presence of transmission delays. PLOS Computational Biology, 18(10), e1010593. https://doi.org/10.1371/journal.pcbi.1010593
* 10.1007/s12080-022-00543-z
* https://academic.oup.com/evlett/article/8/6/881/7725334 in 2024
* https://www.science.org/doi/10.1126/sciadv.abq3542 in 2023
* [https://www.science.org/doi/10.1126/science.abk0989 in 2022](https://www.science.org/doi/10.1126/science.abk0989%20in%202022)
* Kolijn PM et al., Blood 2022; doi: 10.1182/blood.2021012890
* Nge FJ, et al. 2024. Complete genus-level phylogenomics and new subtribal classification of the pantropical plant family Annonaceae. Taxon 73: 1341-1369. 10.1002/tax.13260
* Jung M, et al. 2021. Areas of global importance for conserving terrestrial biodiversity, carbon and water. Nature Ecology & Evolution 5: 1499-1509. s41559-021-01528-7
* https://doi.org/10.1038/s41587-019-0041-2
* <https://doi.org/10.1038/s41586-022-05580-6>
* Low-dose interleukin 2 antidepressant potentiation in unipolar and bipolar depression: Safety, efficacy, and immunological biomarkers.
* Poletti S, Zanardi R, Mandelli A, Aggio V, Finardi A, Lorenzi C, Borsellino G, Carminati M, Manfredi E, Tomasi E, Spadini S, Colombo C, Drexhage HA, Furlan R, Benedetti F.
* Brain Behav Immun. 2024 May;118:52-68. doi: 10.1016/j.bbi.2024.02.019.
* 1. DMRT1 regulates human germline commitment. Irie et al., 2023. https://doi.org/10.1038/s41556-023-01224-7 \
* 2. In vitro reconstitution of epigenetic reprogramming in the human germline. Murase et al., 2024. https://doi.org/10.1038/s41586-024-07526-6 \
* 3. Rapid human oogonia-like cell specification via transcription factor-directed differentiation. Pierson Smela et al., 2025. <https://doi.org/10.1038/s44319-025-00371-2>
* Pulous, F.E., Cruz-Hernández, J.C., Yang, C. et al. Cerebrospinal fluid can exit into the skull bone marrow and instruct cranial hematopoiesis in mice with bacterial meningitis. Nat Neurosci 25, 567–576 (2022). https://doi.org/10.1038/s41593-022-01060-2
* Z. Kolabas, L.Kuemmerle, R. Perneczky, et. al.Distinct molecular profiles of skull bone marrow in health and neurological disorder, Cell (2023) https://doi.org/10.1016/j.cell.2023.07.009
* Koh, B.I., Mohanakrishnan, V., Jeong, HW. et al. Adult skull bone marrow is an expanding and resilient haematopoietic reservoir. Nature 636, 172–181 (2024). <https://doi.org/10.1038/s41586-024-08163-9>
* Big-data approaches lead to an increased understanding of the ecology of animal movement. Nathan, R., Monk, C. T., Arlinghaus, R., Adam, T., Alós, J., Assaf, M., ... & Jarić, I. 2022. DOI: 10.1126/science.abg178
* doi: 10.1038/s41598-024-57526-9
* <https://doi.org/10.1038/s41587-024-02360-7>
* Restoration ecology meets design-engineering: Mimicking emergent traits to restore feedback-driven ecosystems. Temmink et al. 2023.
* 10.1126/science.abe9039
* 10.1126/science.abo6499
* 10.1111/gcb.16450
* 10.1126/science.abl8974
* 10.1016/j.tree.2023.05.005
* 10.1016/j.scitotenv.2024.175793
* de Juan, Silvia, et al. "Biological traits approaches in benthic marine ecology: Dead ends and new paths." Ecology and Evolution 12.6 (2022): e9001. <https://doi.org/10.1002/ece3.9001>
* <https://pubmed.ncbi.nlm.nih.gov/38434676/>
* <https://doi.org/10.3389/fmars.2023.995982>  
  <https://doi.org/10.3389/fmars.2023.1040979>  
  <https://doi.org/10.1007/s10811-025-03447-7>
* DOI: 10.1126/science.abg1780

Optional question: what is in your opinion a canonical paper, book or other written literature, a must-read from your research field?

* Merleau Ponty - Phenomenology of Perception
* The Immortal Life of Henrietta Lacks
* Wetzel’s Limnology: Lake and River Ecosystems; ISBN 978-0-12-822701-5
* Brunel, N. (2000). Dynamics of Sparsely Connected Networks of Excitatory and Inhibitory Spiking Neurons. Journal of Computational Neuroscience, 8.
* Golowasch, J., Goldman, M. S., Abbott, L. F., & Marder, E. (2002). Failure of Averaging in the Construction of a Conductance-Based Neuron Model. Journal of Neurophysiology, 87(2), 1129–1131. https://doi.org/10.1152/jn.00412.2001
* Caswell's Matrix Population Models; Kéry & Schaub's Integrated Population Models
* <https://www.bol.com/nl/nl/f/darwin-comes-to-town/9200000080718975/>
* Immuno-Psychiatry. Hemmo A Drexhage SWP ISBN 9789085602286
* Reconstitution of the mouse germ cell specification pathway in culture by pluripotent stem cells. Hayashi et al., 2011. DOI: 10.1016/j.cell.2011.06.052
* Mazzitelli, J.A., Pulous, F.E., Smyth, L.C.D. et al. Skull bone marrow channels as immune gateways to the central nervous system. Nat Neurosci 26, 2052–2062 (2023). <https://doi.org/10.1038/s41593-023-01487-1>
* PNAS issues about "Movement Ecology" (even though a bit old by now) <https://www.pnas.org/toc/pnas/105/49>
* The origin of species
* doi: 10.1038/s41586-019-1105-7
* Organisms as ecosystem engineers, Jones et al 1994
* Deterministic Nonperiodic Flow, Edward N. Lorenz, 1963
* Forman & Alexander (1998) - Roads and their major ecological effects
* Nathan (2008) - A movement ecology paradigm for unifying organismal movement research
* Animal-sediment relations, McCall end Tevesz, 1982
* doi: 10.1126/science.1193270.
* Migration: The Biology of Life on the Move by Hugh Dingle