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Metabolomics- and methylomics-based predictors for estimating health and biological aging

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List of publications

1. Bizzarri D, Reinders MJT, Beekman M, Slagboom PE, Bbmri- N, van den Akker EB. 1H-NMR metabolomics-based surrogates to impute common clinical risk factors and endpoints. *EBioMedicine*. 2022;75:103764.
2. Niehues A, Bizzarri D, Reinders MJT, Slagboom PE, van Gool AJ, van den Akker EB, et al. Metabolomic predictors of phenotypic traits can replace and complement measured clinical variables in population-scale expression profiling studies. *BMC Genomics*. 2022;23:546.
3. Bizzarri D, Reinders MJT, Beekman M, Slagboom PE, van den Akker EB. MiMIR: R-shiny application to infer risk factors and endpoints from Nightingale Health's 1H-NMR metabolomics data. *Bioinformatics*. 2022;38:3847–9.
4. Buergel T, Steinfeldt J, Ruyoga G, Pietzner M, Bizzarri D, Vojinovic D, et al. Metabolomic profiles predict individual multidisease outcomes. *Nat Med*. 2022;28:2309–20.
5. Bizzarri D, Dollé MET, Loef B, van den Akker EB, van Kerkhof LWM. GlycA, a Biomarker of Low-Grade Inflammation, Is Increased in Male Night Shift Workers. *Metabolites*. 2022;12:1172.
6. Kuiper LM, Polinder-Bos HA, Bizzarri D, Vojinovic D, Vallerga CL, Beekman M, et al. Epigenetic and Metabolomic Biomarkers for Biological Age: A Comparative Analysis of Mortality and Frailty Risk. *The Journals of Gerontology: Series A*. 2023;glad137.
7. Bizzarri D, Reinders MJT, Beekman M, Slagboom PE, van den Akker EB, on behalf of the BbmriNI. Technical Report: A Comprehensive Comparison between Different Quantification Versions of Nightingale Health's 1H-NMR Metabolomics Platform. *Metabolites*. 2023;13:1181.
8. Bizzarri D, Reinders MJT, Kuiper LM, Beekman M, Deelen J, Meurs JBJ van, et al. 1H-NMR metabolomics-guided DNA methylation mortality predictors [Internet]. *medRxiv*; 2023 [cited 2024 May 29]. p. 2023.11.02.23297956. Available from: <https://www.medrxiv.org/content/10.1101/2023.11.02.23297956v1>
9. Jia X, Fan J, Wu X, Cao X, Ma L, Abdelrahman Z, et al. Heterogeneous metabolomic aging across the same age and prediction of health outcome [Internet]. *medRxiv*; 2024 [cited 2024 May 29]. p. 2024.04.22.24306156. Available from: <https://www.medrxiv.org/content/10.1101/2024.04.22.24306156v1>

Curriculum Vitae

Daniele Bizzarri was born on the 18th of July 1993 in Marino (RM), Italy. He pursued his bachelor's degree in Clinical Engineering in December 2015 from La Sapienza University of Rome. His bachelor thesis project consists of a computational microdosimetric study on the effect of a pulsed signal (used in the clinic for electromagnetic stimulation) on a neuronal cell.

He continued his education with a master's degree in Biomedical Engineering again at La Sapienza university of Rome, from which he graduated cum laude in 2018. In 2017, during his master's degree, he won an Erasmus+ Scholarship to study for 6 months at Delft University of Technology in the Netherlands. During his master's he focused his studies on bioinformatics and computational biology concluding his master's with a thesis titled "Network Medicine for personalized disease genes discovery". The aim of his thesis was to ideate and apply a novel method to take advantage of the biological information extracted from protein-protein interaction networks to identify potential biomarkers for complex diseases.

After obtaining his master's degree Daniele started his PhD studies in the group of Molecular Epidemiology (MOLEPI), Department of Biomedical Sciences in the Leiden University Medical Center, Leiden. During this period, Daniele worked jointly in MOLEPI and the Delft Bioinformatics Lab. His research focused on developing, applying, and deploying novel predictive models for human health risks and aging, primarily using metabolomics and DNA methylation from blood in large epidemiological settings (e.g., BBMRI-nl). The results of this research are outlined in this thesis. During his PhD, Daniele collaborated with several research groups in the Netherlands and abroad and presented his work at national and international conferences (e.g., ISMB 2022). Finally, he also actively engaged with the academic community as a member of the board of the PhD Association in the LUMC (LAP), for which he successfully co-organized several events.

Currently, Daniele is employed in the biotech company Genmab as a Scientist for Reverse Translation, where he investigates Clinical Trials on cancer research to attempt to identify novel potential targets and strategies to fight cancer using antibodies.

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After more than five years, my PhD journey has finally come to an end. This period has been immensely important to me, providing the opportunity to enrich my knowledge and grow into a scientist, which is something I always aspired to be. It has been a time of great learning and significant challenges, disseminated by hard-earned victories and invaluable support from family, friends, and colleagues. Your support made all the difference in reaching this goal, and I would like to express my heartfelt gratitude to each one of you.

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