Ricardo Diogo Alves Conde, PhD

Postdoctoral researcher in NMR-based metabolomics and lipoproteomics · CIC bioGUNE, Derio, Spain

ORCID 0000-0003-4372-081X · Google Scholar · ResearchGate

PROFILE

I work on NMR metabolomics of human blood and urine, and for the last five years mostly on lipoproteins. During my PhD in Óscar Millet's lab at CIC bioGUNE, which I defended in October 2026, I measured lipoprotein profiles in more than 31,000 people from five countries and used them to build age- and sex-specific reference values, published in *EBioMedicine* in 2025. I also took part in the MetSCORE metabolic syndrome score, in our work on metabolomic aging clocks, and in moving lipoprotein measurements to an 80 MHz benchtop spectrometer. Before the PhD I spent more than three years at the University of Beira Interior looking for urine and plasma markers of cognitive decline and dementia. I do both the bench work and the statistics myself, and in 2024 I learned to isolate lipoprotein subfractions by ultracentrifugation in Ulrich Günther's lab in Lübeck. I now want to use these tools on cardiovascular questions in patient and population cohorts, in particular endothelial health.

RESEARCH EXPERIENCE

Nov 2026 – present — **Postdoctoral Researcher**, Precision Medicine and Metabolism Lab (Dr. Óscar Millet), CIC bioGUNE (BRTA), Derio, Spain

Oct 2021 – Oct 2026 — **PhD Researcher**, Precision Medicine and Metabolism Lab, CIC bioGUNE (BRTA), Derio, Spain

- Ran NMR metabolomics and lipoprotein analysis (Bruker IVDr, B.I.LISA™) on serum, plasma and urine from cohorts in several countries, from sample preparation to statistics.
- Built age- and sex-specific reference curves for 112 lipoprotein parameters from 31,275 samples (first author, *EBioMedicine* 2025).
- Took part in MetSCORE, a serum NMR score for metabolic syndrome risk (n = 21,323), and in the lab's work on metabolomic aging clocks.
- Helped show that lipoproteins and metabolites can be quantified on an 80 MHz benchtop spectrometer, together with the Australian National Phenome Centre and Bruker BioSpin.
- Quantified serum cytokines by flow cytometry (LEGENDplex bead-based kits) in a cohort of about 1,300 premenopausal women and in a COVID-19 cohort.
- Worked with groups at the Medical University of Graz, the University of Beira Interior and the University of Extremadura.

Mar – May 2024 — **International research stay (3 months)**, Group of Prof. Ulrich Günther, Institute of Chemistry and Metabolomics, University of Lübeck, Germany

- Isolated lipoprotein subfractions from rat serum by ultracentrifugation.

Apr – Jul 2021 — **Researcher**, Health Sciences Research Centre (CICS-UBI), University of Beira Interior, Covilhã, Portugal

- Looked for markers of pancreatic cystic lesions in cyst fluid and plasma by NMR metabolomics.

Sep 2017 – Sep 2020 — **Research Fellow**, CICS-UBI, University of Beira Interior, Covilhã, Portugal

- Looked for markers of cognitive decline and dementia in urine and plasma from the EBICohort study of older adults, by NMR metabolomics.

2018 – 2020 — **Teaching Monitor**, Department of Chemistry, University of Beira Interior · Microbiology laboratory classes

COVID-19 pandemic — **Volunteer**, Hospital Pêro da Covilhã, Portugal · reception and storage of patient samples, laboratory material and PPE, patient database updates

EDUCATION

2021 – 2026 — **PhD in Molecular Biology and Biomedicine**, University of the Basque Country (UPV/EHU), Spain · defended 27 October 2026 · Cum Laude · International Doctorate

Full-time; research at the Precision Medicine and Metabolism Lab, CIC bioGUNE (supervisor: Dr. Óscar Millet). Annual evaluations by the Academic Committee: positive (2021/22 – 2024/25).

2014 – 2016 — **MSc in Biomedical Sciences** (Molecular Biology in Tropical and International Medicine), Institute of Hygiene and Tropical Medicine, NOVA University of Lisbon, Portugal

Final classification 17/20. Thesis: “A metabolomics approach for tuberculosis diagnosis”.

2011 – 2014 **BSc in Biology**, University of Évora, Portugal
Final grade 13/20. Final project: “Characterization of bacteria associated with the Pine Wilt Disease system”.

PEER-REVIEWED PUBLICATIONS

17 articles, three as first author; 217 citations on ResearchGate (November 2026).

1. Lain AD, Go S, Mahmud A, … **Conde R**, … Beck T, Posma JM. Biomedical text corpora for multi-entity recognition in diet-related metabolic syndrome research. *Scientific Data*. 2026 (early access). doi:10.1038/s41597-026-08594-1
2. Gil-Redondo R, **Conde R**, de Diego Á, Fernández-Carrión R, … Embade N, Mato JM, Millet O. Point-of-care metabolomics: concordance of benchtop and high-field NMR for non-invasive physiological profiling. *Journal of Magnetic Resonance*. 2026;391:108162. doi:10.1016/j.jmr.2026.108162
3. Sousa A, Oliveira N, Bizkarguenaga M, de Diego A, **Conde R**, Embade N, Millet Ó, Verde I. Searching for metabolic markers for hypertension in human urine. *Molecules*. 2026;31(18):3349. doi:10.3390/molecules31183349
4. Holm S, Tena-Sempere M, Koutsouris D, … Szczuka Z (incl. **Conde R**). The case for primary prevention of obesity in the era of GLP-1 therapies. *The Lancet Regional Health – Europe*. 2026. ResearchGate record
5. **Conde R** **(first author)**, Gil-Redondo R, Bizkarguenaga M, Lodge S, Nitschke P, … Nicholson JK, Mato JM, Millet O. Age- and sex-specific lipoprotein profiles in general and cardiometabolic population cohorts. *EBioMedicine*. 2025;122:106021. doi:10.1016/j.ebiom.2025.106021
6. Ibáñez de Opakua A, **Conde R**, de Diego A, Bizkarguenaga M, Embade N, Lu SC, Mato JM, Millet O. Metabolomic-based aging clocks. *npj Metabolic Health and Disease*. 2025;3(1):35. doi:10.1038/s44324-025-00078-x
7. Sousa A, Oliveira N, **Conde R**, Morais E, Amaral AP, Embade N, Millet O, Verde I. Nuclear magnetic resonance analysis seeking for metabolic markers of hypertension in human serum. *Molecules*. 2025;30(10):2145. doi:10.3390/molecules30102145
8. Kioroglou D, Gil-Redondo R, Embade N, Bizkarguenaga M, **Conde R**, Millet O, Mato JM, Marigorta UM. Multi-omic integration sets the path for early prevention strategies on healthy individuals. *npj Genomic Medicine*. 2025;10(1):35. doi:10.1038/s41525-025-00491-7
9. Wist J, Nitschke P, **Conde R**, de Diego A, Bizkarguenaga M, … Holmes E, Millet O, Nicholson JK. Benchtop proton NMR spectroscopy for high-throughput lipoprotein quantification in human serum and plasma. *Analytical Chemistry*. 2025;97(12):6399–6409. doi:10.1021/acs.analchem.4c04660 (Correction: 2025;97(39):21758–21759, doi:10.1021/acs.analchem.5c04981)
10. Gil-Redondo R, **Conde R**, Bruzzone C, Seco ML, … Embade N, Mato JM, Millet O. MetSCORE: a molecular metric to evaluate the risk of metabolic syndrome based on serum NMR metabolomics. *Cardiovascular Diabetology*. 2024;23(1):272. doi:10.1186/s12933-024-02363-3
11. Oliveira N, Sousa A, Amaral AP, **Conde R**, Verde I. Identification of urine metabolic markers of stroke risk using untargeted nuclear magnetic resonance analysis. *International Journal of Molecular Sciences*. 2024;25(13):7436. doi:10.3390/ijms25137436
12. Luis-Calero M, Ortiz-Rodríguez JM, Fernández-Hernández P, … Embade N, **Conde R**, Bizkarguenaga M, Millet Ó, González-Fernández L, Macías-García B. Preovulatory follicular fluid secretome added to in vitro maturation medium influences the metabolism of equine cumulus-oocyte complexes. *BMC Veterinary Research*. 2024;20(1):272. doi:10.1186/s12917-024-04129-1
13. Luis-Calero M, Marinaro F, Fernández-Hernández P, … **Conde R**, Bizkarguenaga M, Embade N, … González-Fernández L, Macías-García B. Characterization of preovulatory follicular fluid secretome and its effects on equine oocytes during in vitro maturation. *Research in Veterinary Science*. 2024;171:105222. doi:10.1016/j.rvsc.2024.105222
14. **Conde R** **(first author)**, Oliveira N, Morais E, Amaral AP, Sousa A, Graça G, Verde I. NMR analysis seeking for cognitive decline and dementia metabolic markers in plasma from aged individuals. *Journal of Pharmaceutical and Biomedical Analysis*. 2023;238:115815. doi:10.1016/j.jpba.2023.115815
15. Bruzzone C, **Conde R**, Embade N, Mato JM, Millet O. Metabolomics as a powerful tool for diagnostic, prognostic and drug intervention analysis in COVID-19. *Frontiers in Molecular Biosciences*. 2023;10:1111482. doi:10.3389/fmolb.2023.1111482
16. Gil-Redondo R, **Conde R**, Bizkarguenaga M, Bruzzone C, Laín A, … Nicholson JK, Mato JM, Millet O. An NMR-based model to investigate the metabolic phenoreversion of COVID-19 patients throughout a longitudinal study. *Metabolites*. 2022;12(12):1206. doi:10.3390/metabo12121206
17. **Conde R** **(first author)**, Laires R, Gonçalves LG, Rizvi A, … Matzapetakis M, Coelho AV. Discovery of serum biomarkers for diagnosis of tuberculosis by NMR metabolomics including cross-validation with a second cohort. *Biomedical Journal*. 2022;45(4):654–664. doi:10.1016/j.bj.2021.07.006

CONFERENCE ABSTRACTS, PROCEEDINGS AND PREPRINTS

1. **Conde R**, Gil-Redondo R, Bizkarguenaga M, … Millet O. Age- and sex-adjusted NMR lipoprotein profiles reveal early atherogenic signatures before clinical CVD onset. *Atherosclerosis* (e-poster and abstract, 94th EAS Congress). 2026.
2. **Conde R**, Gil-Redondo R, Bizkarguenaga M, … Millet O. Epidemiological analysis of cardiovascular risk factors and their impact on NMR-based lipoprotein subfractions. *Atherosclerosis* (e-poster and abstract, 94th EAS Congress). 2026.
3. Barahona-López C, Sánchez-Gordón G, Ruiz Moreno E, … Castelló A. Validation of inflammatory dietary indexes with biomarkers in women in Spain. *Gaceta Sanitaria* (abstract 308). 2026.
4. Sánchez-Gordón G, Barahona-López C, Anta B, … Castelló A. Consumo de grupos alimentarios y su relación con biomarcadores de inflamación en mujeres de mediana edad. *Gaceta Sanitaria* (abstract 760). 2025.
5. Barahona-López C, Sánchez-Gordón G, Sierra A, … Castelló A. Asociación entre biomarcadores inflamatorios y recomendaciones internacionales para la prevención del cáncer en mujeres premenopáusicas. *Gaceta Sanitaria* (abstract 190). 2025.
6. Elizondo S, Hernandez M, Londoño F, … Epelde G. Evaluation of synthetic data generation models for balancing multiclass metabolomic profiles. Conference paper. 2025.
7. Martín Asiain M, Londoño F, Hernandez M, … Beristain A. Implementation and evaluation of models for synthetic generation of spectral signals to balance metabolomic data. Conference paper. 2025.
8. **Conde R**, Gil-Redondo R, Bizkarguenaga M, … Millet O. Trajectories of lipoprotein particles in aging: gender-specific patterns and health status correlation. *Atherosclerosis* (poster and abstract, 92nd EAS Congress). 2024.
9. **Conde R**, Gil-Redondo R, Bizkarguenaga M, … Millet O. Effects of COVID-19 severity on the atherosclerotic risk post-recovery: relation between inflammation and lipoproteins. *Atherosclerosis* (e-poster and abstract, 91st EAS Congress). 2023.
10. **Conde R**, Faias S, Roque R, … Fonseca CP. Metabolomic analysis of pancreatic cyst fluid and plasma by proton nuclear magnetic resonance spectroscopy. Oral presentation, United European Gastroenterology Week, Vienna. 2022.
11. Faias S, **Conde R**, Roque R, … Fonseca CP. Mo1255: Metabolomic analysis of pancreatic cyst fluid by proton nuclear magnetic resonance spectroscopy. *Gastroenterology* (abstract). 2022.
12. **Conde R**, Desouzart G, Verde I. Relação de biomarcadores da dor antes e após uma intervenção postural. ICHWBI 2021 (abstract). 2021.

OTHER COMMUNICATIONS AT CONGRESSES

2025	Metabolomic insights into cardiometabolic health: bridging the gap between metabolic dysfunction and cardiovascular disease risk · oral · NMR Metabolomics Symposium, Nantes
2024	Lipoprotein size and composition variability with sex and age for a better diagnostic of the cardiometabolic risk · poster MTB-003 · EUROMAR 2024, Bilbao
2023	Prostate cancer and benign prostatic hyperplasia diagnosis through a NMR-based metabolomics approach · 2nd GERMN-junior Symposium, Spain
2022	COVID-19 severity affects atherosclerotic risk: a view from NMR-based metabolomics approach · poster · 11th GERMN Biennial NMR Meeting, Spain
2021	1H NMR-based metabolomics approach for dementia and cognitive impairment detection · oral, online · 10th GERMN – 9th Ibero-American – 7th Iberian NMR Meeting
2019	Untargeted 1H NMR-based metabolomics analysis of plasma in EBICohort elders looking for a cognitive impairment fingerprinting · oral · III International Congress in HSR – Trends in Aging and Cancer, UBI
2019	Metabolomic analysis of plasma of EBICohort individuals with different Framingham stroke risk scores (Oliveira N, … Conde R, …) · poster · same congress
2019	Characterization of a population based on their cognitive impairment severity · poster · XIV Annual CICS-UBI Symposium
2018	NMR-based urinary metabonomic studies to identify diaper and cotton ball contaminations · poster · XIII CICS-UBI Symposium

CONGRESSES ATTENDED

24–27 May 2026	94th European Atherosclerosis Society (EAS) Congress (two e-posters)

30 Jun–3 Jul 2025	XL Biennial Meeting of the Royal Spanish Society of Chemistry (RSEQ), Bilbao
16–18 Jun 2025	NMR Metabolomics Symposium, Nantes (oral presentation)
30 Jun–4 Jul 2024	EUROMAR 2024, Bilbao (poster)
26–29 May 2024	92nd EAS Congress (poster)
21–24 May 2023	91st EAS Congress, Mannheim (e-poster)
13–14 Apr 2023	2nd GERMN-junior Symposium (with contribution)
13–15 Oct 2022	11th GERMN Biennial NMR Meeting (poster)
Oct 2022	United European Gastroenterology (UEG) Week, Vienna (oral presentation)
2021	10th GERMN – 9th Ibero-American – 7th Iberian NMR Meeting (online, oral presentation)
2013 – 2019	III International Congress in HSR – Trends in Aging and Cancer (UBI, 2019) · XIV and XIII CICS-UBI Symposia (2019, 2018) · IV National Congress of Tropical Medicine (NOVA Lisbon, 2017) · XVII and XVI National Meetings of Biology Students (2014, 2013) · "20 years of the Biology course" (Évora, 2013)
Oct 2021–Jul 2025	CIC bioGUNE seminar series

COURSES AND TRAINING

18–23 Jun 2023	XV International "Manuel Rico" NMR School
25–27 Jan 2023	Microbiota: Basics and Implications for Health
28 Nov–1 Dec 2022	X-Ray Crystallography, Advanced
7 Nov 2022	X-Ray Crystallography, Basic
19–20 Sep 2022	Extracellular Vesicles: Principles and Applications
19–24 Jun 2022	XIV "Manuel Rico" NMR Summer School
6–9 Jun 2022	Hands-on NMR-based Metabolomics: Principles, Methods, and Applications
10–22 Feb 2022	Aplicaciones de la RMN al estudio de la estructura y conformación de moléculas orgánicas y de sus interacciones con receptores moleculares
Nov 2020	Hands-on Data Analysis of Metabolic Profiling, Imperial College London
2013 – 2016	Bioinformatics tools in clinical proteomics data analysis (University of Lisbon, 2016) · 8th Practical Basic NMR course (NOVA Lisbon, 2015) · Erasmus Intensive Programme NACELA (Daugavpils University, Latvia, 2014) · Biotoxins in aquatic ecosystems (University of Algarve, 2014) · Technology of monoclonal antibodies (University of Évora, 2013)

RESEARCH PROJECTS

2017 – 2020	An Omics Network to Prevent and Control Infectious Diseases and Antimicrobial Resistance · SAICTPAC/0015/2015
2017 – 2020	Interdisciplinary Challenges of Neurodegeneration (ICON) · CENTRO-01-0145-FEDER-000013
2015 – 2016	TBomics: an omics approach for diagnosing tuberculosis · NEW-INDIGO/0001/2012

SKILLS AND LANGUAGES

NMR spectroscopy	1H NMR metabolomics of serum, plasma, urine and other biofluids; spectra acquisition and processing (600 MHz IVDr and 80 MHz benchtop); lipoprotein quantification (B.I.LISA™); metabolite identification and quantification
Data analysis	Univariate and multivariate statistics (PCA, PLS-DA, O-PLS-DA); reference percentile modelling in large cohorts; risk scores and predictive models; multi-omic integration
Software	R, SIMCA-P, MATLAB, Chenomx NMR Suite, TopSpin, SPSS, Origin
Wet lab	Isolation of lipoprotein subfractions by ultracentrifugation; serum cytokine quantification by flow cytometry (LEGENDplex); mass spectrometry, proteomics, HPLC, PCR, Western blot, ELISA; processing of blood and urine samples
Teaching	Microbiology laboratory classes, University of Beira Interior (2018 – 2020)
Languages	Portuguese (native) · English (C1, advanced) · Spanish (strong comprehension and conversational proficiency)