Dr Rémi Zallot

Senior Lecturer (Associate Professor) in Biochemistry
Department of Life Sciences, Manchester Metropolitan University, UK

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Academic Positions

Senior Lecturer (Associate Professor) in Biochemistry Aug 2024 – present
Department of Life Sciences, Manchester Metropolitan University, UK

Lecturer (Assistant Professor) in Biochemistry Jun 2023 – Aug 2024
Department of Life Sciences, Manchester Metropolitan University, UK

Research Associate Mar 2022 – Jun 2023
Manchester Institute of Biotechnology (MIB), The University of Manchester, UK

Marie Skłodowska-Curie Individual Fellow Oct 2019 – Mar 2022
Institute of Life Science, Swansea University Medical School, UK
"deCrYPtion" project (ID 839116), decrypting *Mycobacterium* cytochrome P450 physiological functions using comparative genomics. Supervisor: Prof. Steven L. Kelly.

Enzyme Function Initiative team 2016 – 2019
Carl R. Woese Institute for Genomic Biology, University of Illinois at Urbana-Champaign, USA
Enhanced the EFI genomic enzymology web tools; characterised genes from the human gut microbiome; trained biochemists in comparative genomics approaches.

Postdoctoral Researcher 2011 – 2016
Microbiology and Cell Science Department, University of Florida, USA
Characterised genes involved in B vitamin metabolism and queuosine tRNA modification in plants and microbes.

Education

PhD, Biochemistry / Plant Biology 2011
Laboratoire de Biogenèse Membranaire
Thesis: *Identification and characterization of a lipase expressed during Arabidopsis thaliana reserves hydrolysis*.

Master's, Plant Biology and Biotechnology
Université de Bordeaux, France

Licence, Biochemistry
Université de Bordeaux, France

Research Interests

My aim is to advance our fundamental understanding of microbes to enhance human health. I focus on characterising and understanding the functions of genes from microbes, particularly pathogens, to leverage this knowledge for developing new drugs and biotechnological applications. My approach is multidisciplinary, combining bioinformatics — including comparative genomics and genomic enzymology — with experimental techniques from microbiology, genetics, and biochemistry.

Grants and Funding

The Academy of Medical Sciences – Springboard Award (SBF009\1016) Aug 2024 – Jul 2026
£125,000
STEROSPRING: Characterising an Uncharted Lanosterol Catabolic Pathway in Non-Tuberculous Mycobacterial (NTM) Species.

MMU Research and Knowledge Exchange – Research Accelerator Grant Jan – Dec 2023
£7,000
Deciphering an Uncharted Sterol Catabolic Pathway and Its Relevance in Non-Tuberculous Mycobacterial Infection.

Manchester-Melbourne-Toronto (MMT) Research Funds Apr 2023
£6,960 – Grant P122678
Missing Links in Global Sulphur Metabolism. Instructor for Genomic Enzymology and Enzyme Function Initiative training, Melbourne, Australia.

Marie Skłodowska-Curie Individual Fellowship Oct 2019 – Mar 2022
€212,933 – European Commission, Horizon 2020, Grant 839116

Higher Education Investment and Recovery Fund Aug 2021 – Feb 2022
£33,954 – Higher Education Funding Council for Wales (HEFCW)

Inception Programme (Investissement d'Avenir) – Travel Grant Jun 2019
€3,000 – Grant ANR-16-CONV-0005
Workshop Instructor, "From Genes to Function: A Survival Guide to Web-Based Tools for Microbiologists," Institut Pasteur, Paris.

Sêr Cymru II COFUND Fellowship Jul 2019
£173,000 – Grant SU190
Offer declined due to concurrent MSCA Individual Fellowship.

Wales Marie Skłodowska-Curie Individual Fellowship Summer School May 2018
£2,000 travel grant

Allocation de recherche (PhD Research Allowance Award) Sep 2008 – Nov 2011
€90,000
French Ministry of Higher Education and Research (Ministère de l'Enseignement Supérieur et de la Recherche).

Publications

[1] Valérie Crécy-Lagard, Geoffrey Hutinet, José Cediel-Becerra, Yifeng Yuan, Rémi Zallot, Marc Chevrette, RM Ratnayake, Marshall Jaroch, Samia Quaiyum, Steven Bruner, et al. "Biosynthesis and function of 7-deazaguanine derivatives in bacteria and phages". In: *Microbiology and Molecular Biology Reviews* (2024).

[2] Mochen Dong, Zhuoyun Chen, Yuan He, Rémi Zallot, and Yi Jin. "Bioinformatics-facilitated identification of novel bacterial sulfoglycosidases that hydrolyze 6-Sulfo-N-acetylglucosamine". In: *ACS Bio & Med Chem Au* (2024).

[3] Guangcai Xu, Daniele Torri, Sebastian Cuesta-Hoyos, Deepanjan Panda, Luke Yates, Rémi Zallot, Kehan Bian, Dongxu Jia, Andreea Iorgu, Colin Levy, et al. "Cryptic enzymatic assembly of peptides armed with β-lactone warheads". In: *Nature chemical biology* (2024).

[4] Nils Oberg, Rémi Zallot, and John Gerlt. "EFI-EST, EFI-GNT, and EFI-CGFP: enzyme function initiative (EFI) web resource for genomic enzymology tools". In: *Journal of molecular biology* (2023).

[5] Zhen Zhang, Mochen Dong, Rémi Zallot, George Blackburn, Nini Wang, Chengjian Wang, Long Chen, Patrick Baumann, Zuyan Wu, Zhongfu Wang, et al. "Mechanistic and structural insights into the specificity and biological functions of bacterial sulfoglycosidases". In: *ACS Catalysis* (2022).

[6] Qiang Li, Rémi Zallot, Brian MacTavish, Alvaro Montoya, Daniel Payan, You Hu, John Gerlt, Alexander Angerhofer, Valérie Crécy-Lagard, Steven Bruner, et al. "Epoxyqueuosine reductase QueH in the biosynthetic pathway to tRNA queuosine is a unique metalloenzyme". In: *Biochemistry* (2021).

[7] Remi Zallot, Nils Oberg, and John Gerlt. "Discovery of new enzymatic functions and metabolic pathways using genomic enzymology web tools". In: *Current opinion in biotechnology* (2021).

[8] Yifeng Yuan, Rémi Zallot, Tyler Grove, Daniel Payan, Isabelle Martin-Verstraete, Sara Šepić, Seetharamsingh Balamkundu, Ramesh Neelakandan, Vinod Gadi, Chuan-Fa Liu, et al. "Discovery of novel bacterial queuine salvage enzymes and pathways in human pathogens". In: *Proceedings of the National Academy of Sciences* (2019).

[9] Rémi Zallot, Nils Oberg, and John Gerlt. “The EFI web resource for genomic enzymology tools: leveraging protein, genome, and metagenome databases to discover novel enzymes and metabolic pathways”. In: *Biochemistry* (2019).

[10] Michael Carter, Xinshuai Zhang, Hua Huang, Jason Bouvier, Brian Francisco, Matthew Vetting, Nawar Al-Obaidi, Jeffrey Bonanno, Agnidipta Ghosh, Rémi Zallot, et al. “Functional assignment of multiple catabolic pathways for D-apiose”. In: *Nature chemical biology* (2018).

[11] Katherine Harrison, Valérie Crécy-Lagard, and Rémi Zallot. “Gene Graphics: a genomic neighborhood data visualization web application”. In: *Bioinformatics* (2018).

[12] Rémi Zallot, Nils Oberg, and John Gerlt. “‘Democratized’genomic enzymology web tools for functional assignment”. In: *Current opinion in chemical biology* (2018).

[13] Rémi Zallot, Robert Ross, Wei-Hung Chen, Steven Bruner, Patrick Limbach, and Valérie Crécy-Lagard. “Identification of a novel epoxyqueuosine reductase family by comparative genomics”. In: *ACS chemical biology* (2017).

[14] Rémi Zallot, Yifeng Yuan, and Valérie Crécy-Lagard. “The Escherichia coli COG1738 member YhhQ is involved in 7-cyanodeazaguanine (preQ0) transport”. In: *Biomolecules* (2017).

[15] Ghulam Hasnain, Sanja Roje, Na Sa, Rémi Zallot, Michael Ziemak, Valérie Crécy-Lagard, Jesse Gregory, and Andrew Hanson. “Bacterial and plant HAD enzymes catalyse a missing phosphatase step in thiamin diphosphate biosynthesis”. In: *Biochemical Journal* (2016).

[16] Christopher Henry, Claudia Lerma-Ortiz, Svetlana Gerdes, Jeffrey Mullen, Ric Colasanti, Aleksey Zhukov, Océane Frelin, Jennifer Thiaville, Rémi Zallot, Thomas Niehaus, et al. “Systematic identification and analysis of frequent gene fusion events in metabolic pathways”. In: *BMC genomics* (2016).

[17] Lili Huang, Anna Khusnutdinova, Boguslaw Nocek, Greg Brown, Xiaohui Xu, Hong Cui, Pierre Petit, Robert Flick, Remi Zallot, Kelly Balmant, et al. “A family of metal-dependent phosphatases implicated in metabolite damage-control”. In: *Nature Chemical Biology* (2016).

[18] Manaki Mimura, Rémi Zallot, Thomas Niehaus, Ghulam Hasnain, Satinder Gidda, Thuy Nguyen, Erin Anderson, Robert Mullen, Greg Brown, Alexander Yakunin, et al. “Arabidopsis TH2 encodes the orphan enzyme thiamin monophosphate phosphatase”. In: *The Plant Cell* (2016).

[19] Rémi Zallot, Katherine Harrison, Bryan Kolaczkowski, and Valérie Crécy-Lagard. “Functional annotations of paralogs: a blessing and a curse”. In: *Life* (2016).

[20] Ekaterina Kuznetsova, Boguslaw Nocek, Greg Brown, Kira Makarova, Robert Flick, Yuri Wolf, Anna Khusnutdinova, Elena Evdokimova, Ke Jin, Kemin Tan, et al. “Functional diversity of haloacid dehalogenase superfamily phosphatases from Saccharomyces cerevisiae: biochemical, structural, and evolutionary insights”. In: *Journal of Biological Chemistry* (2015).

[21] Samuel Seaver, Svetlana Gerdes, Océane Frelin, Claudia Lerma-Ortiz, Louis Bradbury, Rémi Zallot, Ghulam Hasnain, Thomas Niehaus, Basma El, Shiran Pasternak, et al. “High-throughput comparison, functional annotation, and metabolic modeling of plant genomes using the PlantSEED resource”. In: *Proceedings of the National Academy of Sciences* (2014).

[22] Rémi Zallot, Céline Brochier-Armanet, Kirk Gaston, Farhad Forouhar, Patrick Limbach, John Hunt, and Valérie Crécy-Lagard. “Plant, animal, and fungal micronutrient queuosine is salvaged by members of the DUF2419 protein family”. In: *ACS chemical biology* (2014).

[23] Rémi Zallot, Mohammad Yazdani, Aymeric Goyer, Michael Ziemak, Jiahn-Chou Guan, Donald McCarty, Valérie Crécy-Lagard, Svetlana Gerdes, Timothy Garrett, Jordi Benach, et al. “Salvage of the thiamin pyrimidine moiety by plant TenA proteins lacking an active-site cysteine”. In: *Biochemical Journal* (2014).

[24] Yonghua Li-Beisson, Basil Shorrosh, Fred Beisson, Mats Andersson, Vincent Arondel, Philip Bates, Sébastien Baud, David Bird, Allan DeBono, Timothy Durrett, et al. “Acyl-lipid metabolism”. In: *The Arabidopsis book/American Society of Plant Biologists* (2013).

[25] Mohammad Yazdani, Rémi Zallot, Meral Tunc-Ozdemir, Valérie Crécy-Lagard, David Shintani, and Andrew Hanson. “Identification of the thiamin salvage enzyme thiazole kinase in Arabidopsis and maize”. In: *Phytochemistry* (2013).

[26] Rémi Zallot, Gennaro Agrimi, Claudia Lerma-Ortiz, Howard Teresinski, Océane Frelin, Kenneth Ellens, Alessandra Castegna, Annamaria Russo, Valérie Crécy-Lagard, Robert Mullen, et al. “Identification of mitochondrial coenzyme a transporters from maize and Arabidopsis”. In: *Plant physiology* (2013).

[27] Rémi Zallot. “Identification et caractérisation d’une lipase exprimée pendant l’hydrolyse des réserves chez Arabidopsis thaliana”. PhD thesis. 2011.

[28] Y. Li-Beisson, B. Shorrosh, F. Beisson, M. Andersson, V. Arondel, P. Bates, S. Baud, D. Bird, A. DeBono, T. Durrett, et al. “The arabidopsis book”. In: *American Society of Plant Biologists* (2010).

[29] Fabienne Furt, Sabine König, Jean-Jacques Bessoule, Françoise Sargueil, Rémi Zallot, Thomas Stanislas, Elodie Noirot, Jeanine Lherminier, Françoise Simon-Plas, Ingo Heilmann, et al. “Polyphosphoinositides are enriched in plant membrane rafts and form microdomains in the plasma membrane”. In: *Plant physiology* (2010).

Teaching

Module Leader, Biomedical Cell Biology (BCB) 2023 – present
Manchester Metropolitan University, Department of Life Sciences
Final-year optional module for students on the accredited Biomedical Science programme.

Medical Microbiology 2023 – present
Manchester Metropolitan University, Department of Life Sciences
Teaching contributor; supervises final-year student projects.

Conferences and Talks

- **Summer 2026 meeting of the Acid Fast Club** — Conference attended. Liverpool School of Tropical Medicine, Liverpool, UK. July 2026.
- **Department Summer research symposium Seminar** — Oral presentation. Manchester Metropolitan University, Department of Life Sciences, Manchester, UK. April 2026.
- **Invited Seminar** — Invited talk. Institute of Medical Research, Northwestern Polytechnical University, Xi’an, China. April 2026.
- **Invited Seminar** — Invited talk. Shanghai Jiao Tong University Medical School, Shanghai, China. April 2026.
- **Tuberculosis: Understanding the Disease Across Scales** — Poster. Keystone Symposium, Cape Town, South Africa. March 2026.
- **Winter Acid Fast Club meeting** — Conference attended. Acid Fast Club, London, UK. January 2026.
- **Leicester 2025 summer session of the Acid Fast Club meeting** — Oral presentation. Acid Fast Club, Leicester, UK. July 2025.
- **Invited talk for MMU ECR and PhD Conference** — Invited talk. Faculty of Science and Engineering, Manchester Metropolitan University, Manchester, UK. September 2024.
- **Invited talk** — National University of Singapore, Singapore. April 2024.
- **Invited virtual seminar for the Catalysis Innovation Consortium** — Invited talk. Catalysis Innovation Consortium, Virtual, USA. March 2024.
- **Poster presentation** — Gordon Research Conference on Enzymes, Coenzymes and Metabolic Pathways, Waterville Valley, NH, USA. July 2023.
- **Invited talk and EFI workshop** — National University of Singapore, Singapore. November 2023.
- **Invited talk** — Chinese Academy of Sciences, Institute of Microbiology, Beijing, China. December 2023.
- **Invited talk** — Northwest University, Xi’an, China. December 2023.
- **Understanding antimicrobial resistance requires characterising unknown genes** — Invited talk. Manchester Institute of Biotechnology Fellowship days, The University of Manchester, Manchester, UK. January 2022.
- **Comparative genomics and genomic enzymology approaches for functional assignment** — Poster (selected for a short oral presentation). Manchester Institute of Biotechnology Annual Science Day, Manchester, UK. 2022.
- **Similarity Networks and Genome Neighborhood Networks for function assignment** — Invited talk. School of Chemistry, Cardiff University, Cardiff, UK. April 2021.
- **Genomic enzymology web tools for functional assignment** — Invited talk. Institut Pasteur, Centre of Bioinformatics, Biostatistics and Integrative Biology, Paris, France. June 2019.
- **Quel and its associated activator QueJ are non-orthologous replacement of the nitrile reductase QueF in the queuosine biosynthesis pathway** — Poster. Gordon Research Seminar and Conference, Enzymes, Coenzymes and Metabolic Pathways, Waterville Valley, NH, USA. 2018.
- **Quel and its associated activator QueJ are non-orthologous replacement of the nitrile reductase QueF in the queuosine biosynthesis pathway** — Poster. Frontiers in Metallobiochemistry Symposium and Bioinorganic Workshop, State College, PA, USA. 2018.
- **Comparative genomics for the identification of unknown genes, enzymes and transporters involved**

in Queuosine metabolism — Invited talk. University of Illinois at Urbana-Champaign, USA. August 2016.

- **Production of molecules of interest from plants in Yeast, can comparative genomics help?** — Invited talk. Université François Rabelais, Tours, France. May 2016.
- **Is Streptomyces secondary metabolism regulation involving lipid rafts?** — Invited talk. Université Paris 11, Orsay, France. May 2016.
- **Identification of missing enzymes and transporters involved in the synthesis and salvage of Queuosine by comparative genomics** — Poster. EMBO Conference, Ribosome Structure and Function, Strasbourg, France. 2016.
- **Identification of missing enzymes and transporters involved in the synthesis and salvage of Queuosine by comparative genomics** — Poster. DOE JGI User meeting, Genomics of Energy and Environment Meeting, Walnut Creek, CA, USA. 2016.
- **Identification of genes involved in Queuosine Salvage** — Poster. Gordon Research Conference, RNA editing, Lucca (Barga), Italy. 2015.
- **Salvage of the thiamin pyrimidine moiety by plant TenA proteins lacking an active site cysteine** — Invited talk. Plant Biology conference, Portland, OR, USA. July 2014.
- **Identification of maize and Arabidopsis genes for the salvage of thiamin breakdown products** — Poster. Gordon Research Conference, Plant Metabolic Engineering, Waterville Valley, NH, USA. 2013.
- **Identification of a potential queuine salvage gene in eukaryotes** — Poster. XXIV tRNA Conference, Olmué, Chile. 2012.
- **Identification of a triacylglycerol-lipase from Brassica napus by functional proteomics** — Poster (selected for a short oral presentation). 5th European Symposium on Plant Lipids, Gdansk, Poland. 2011.

Professional Service and Memberships

- Member, Acid Fast Club (since July 2026)
- Expert Evaluator, European Commission Horizon Europe programme
- Member, UKRI Talent Peer Review College (PRC)
- Bacterial lead, Genetically Modified Organisms Health and Safety Committee, Manchester Metropolitan University
- Carbon Literacy Champion, Department of Life Sciences, Manchester Metropolitan University
- Member, Microbiology Society (since 2019)
- Member, NTM Network UK, Basic Science & Microbiology interest group
- Fellow of the Higher Education Academy (FHEA)