

Elisabetta Cacace, MD PhD
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 Institute of Microbiology, ETH Zurich

Research Interests: antimicrobial resistance, drug-drug interactions, bacterial genomics, host-pathogen interactions

Academic career

Since 2023 **Postdoc** | Institute of Microbiology, ETH Zurich | Groups: Prof. S. Sunagawa; Prof. E. Slack
 2021-2022 **Postdoc** | Institute of Medical Microbiology and Infection Control, Goethe University Hospital, Frankfurt am Main, Germany (Group: Dr. S. Göttig)
 2021-2022 Visiting Postdoc | Genome Biology Unit, EMBL Heidelberg, Germany (Group: Dr. A. Typas)
 2016-2021 **Ph.D.**, Joint Degree by European Molecular Biology Laboratory (EMBL International PhD Programme) and University of Groningen, Netherlands. Supervisors: Dr. A. Typas; Prof. O. Kuipers
 2016 **M.Sc.**, 100/100 with honors, Scuola Superiore Sant'Anna, Pisa, Italy. Supervisors: Prof. F. A. Recchia and Dr. D. Thieffry
 2016 Swiss License to Medical Practice
 2016 Italian License to Medical Practice
 2009-2015 **MD**, 110/110 with honors and special mention from thesis committee | University of Pisa, Italy | Supervisor: Prof. P. Migliorini

Third-party funding and awards

2024-2026 Novartis Freenovation
 2024-2025 SNSF Spark
 2024 FEMS Early Career Scientist Meeting Grant
 2023 FEBS Short-Term Fellowship
 2023 Best Poster Prize | 15th Seeon Conference on Microbiota, Probiotics and Host, Seeon, Germany
 2022 FEMS Early Career Scientist Meeting Grant
 2018 Selected for the 68th Lindau Nobel Laureate Meeting | EMBL sponsorship
 2016-2021 EMBL Predoctoral Fellowship | EMBL International PhD Programme
 2016 Erasmus Traineeship
 2015 Golden Caduceus award as youngest MD graduate | Order of Physicians and Surgeons, Siena, Italy
 2014 Visiting Student Elective | UCL Medical School, Department of Infectious Diseases, Royal Free Hospital, London, UK | Supervisor: Dr I. Cropley (Scuola Superiore Sant'Anna Mobility Stipend)
 2014 Highly commended in the 2014 Undergraduate Awards, Life Sciences category
 2013 Amgen Scholarship | Supervisor: Dr M. Anderson, MRC CBU, Cambridge, UK
 2013 École Normale Supérieure – Scuola Superiore Sant'Anna Scholars Exchange Scholarship
 2012 MRC Summer Studentship | Supervisor: Dr M. M. Babu, MRC LMB, Cambridge, UK
 2011-2015 Scuola Superiore Sant'Anna Full Scholarship

Publications

Peer-reviewed

Jendrusch MA, Yang ALJ, **Cacace E**, Bobonis J, Voogdt CGP, Kaspar S, Schweimer K, Perez-Borrajero C, Lapouge K, Scheurich J, Remans K, Hennig J, Typas A, Korbel JO, Sadiq SK (2025) AlphaDesign: A *de novo* protein design framework based on AlphaFold. *Mol. Syst. Biol.*, accepted.

Cacace E, Tietgen M, Steinhauer M, Mateus A, Parzeller J, Schultze T, Eckermann M, Riedel-Christ S, Galardini M, Koumoutsis A, Varik V, Koumoutsis A, Parzeller JJ, Corona F, Orakov A, Knopp M, Brauer-Nikonow A, Bork P, Romao CV, Zimmermann M, Kloetens P, Typas A, Göttig S (2025) Uncovering nitroxoline activity spectrum, mode of action and resistance across Gram-negative bacteria. *Nat. Commun.* **16**, 3783 (2025). doi: 10.1038/s41467-025-58730-5.

Sakenova N, **Cacace E**, Orakov A, Huber F, Varik V, Kritikos G, Michiels J, Bork P, Cossart P, Goemans CV, Typas A (2025) Systematic mapping of antibiotic cross-resistance and collateral-sensitivity with chemical genetics. *Nat. Microbiol.* **10**, 202–216. doi: 10.1038/s41564-024-01857-w.

Sommer J, Reiter H, Sattler J, **Cacace E**, Eisfeld J, Gattermann SG, Hamprecht A, Göttig S (2024) Emergence of OXA-48-like producing *Citrobacter* species, Germany, 2011-2022. *Euro Surveill.* **2024**;29(15):pii=2300528. doi:10.2807/1560-7917.ES.2024.29.15.2300528.

Cacace E, Kim V, Varik V, Knopp M, Tietgen M, Brauer-Nikonow A, Inecik K, Mateus A, Milanese A, Torrisen Mârli M, Mitosch K, Selkig J, Brochado AR, Kuipers OP, Kjos M, Zeller G, Savitski MM, Göttig S, Huber W, Typas A (2023) Systematic analysis of drug combinations against Gram-positive bacteria. *Nat. Microbiol.* **8**, 2196–2212. doi: 10.1038/s41564-023-01486-9.

Maier L, Goemans CV, Wirbel J, Kuhn M, Eberl C, Pruteanu M, Müller P, Garcia-Santamarina S, **Cacace E**, Zhang B, Gekeler C, Banerjee T, Anderson EE, Milanese A, Löber U, Forslund SK, Patil KR, Zimmermann M, Stecher B, Zeller G, Bork P, Typas A (2021) Unravelling the collateral damage of antibiotics on gut bacteria. *Nature*. doi: 10.1038/s41586-021-03986-2.

Cacace E, Collombet S, Thieffry D (2020) Logical modeling of cell fate specification - application to T cell commitment. *Curr. Top. Dev. Biol.* 139:205-238. doi: 10.1016/bs.ctdb.2020.02.008.

Cacace E, Kritikos G, Typas A (2017) Chemical genetics in drug discovery. *Curr. Opin. Syst. Biol.* 4:35–42. doi: 10.1016/j.coisb.2017.05.020.

Passino C, **Cacace E**, Caratozzolo D, Rossari F, Saccaro LF (2017) “Mechanisms and Chemistry of Respiration in Health”, in: Emdin M et al (eds.), *The Breathless Heart: Apneas in Heart Failure*, Springer International Publishing Switzerland, pp. 11-34. doi: 10.1007/978-3-319-26354-0_3.

Preprints

Vonesch SC, Bredikhin D, Dobrev N, Villacorta L, Kleinendorst R, **Cacace E**, Flock J, Frank M, Jung F, Kornienko J, Mitosch K, Osuna-Lopez M, Zimmermann J, Göttig S, Hamprecht A, Kräusslich H, Knop M, Typas A, Steinmetz LM, Benes V, Remans K, Krebs AR (2020) McQ - an open-source multiplexed SARS-CoV-2 quantification platform. *medRxiv*. doi: 10.1101/2020.12.02.20242628

Patents

European patent application number No. EP22207154.0 *Novel combinations of antibiotics and non-antibiotic drugs effective in vivo against Gram-positive bacteria, in particular methicillin-resistant S. aureus (MRSA)* (co-inventor).

US patent application number No. 17782654 *Compounds and pharmaceutical compositions for prevention and/or treatment of dysbiosis and antibacterial antidotes for microbiome-protection* (co-inventor).

Conference presentations (selected)

- 2025 JPIAMR Final Conference, Stockholm, SE (invited speaker and panelist)
- 2024 “New Approaches to Combat Antimicrobial Resistance”, Ascona, CH (talk)
- 2024 “New Approaches and Concepts in Microbiology”, EMBL Heidelberg, DE (poster)
- 2023 15th Seeon Conference on Microbiota, Probiotics and Host”, Seeon, DE (poster)
- 2023 “BioVaria: Europe’s Leading Showcasing Event for Life-Science Technologies”, Munich, DE (talk)
- 2023 “New Approaches to Combat Antimicrobial Resistance”, Ascona, CH (talk)
- 2022 “New Approaches and Concepts in Microbiology”, EMBL Heidelberg, DE (poster)
- 2021 European Congress of Clinical Microbiology and Infectious Diseases (ECCMID), Amsterdam, NL (poster)
- 2019 “Young Researchers in Life Science” Conference, Paris, FR (talk)
- 2016 “3rd Conference on translational medicine on pathogenesis of immune-mediated diseases”, Milan, IT (poster)
- 2014 Bioinformatics Italian Society Conference 2014, Rome, IT (poster)

Invited lectures (selected)

Wellcome Sanger Institute, Hinxton (2025); Institute of Biochemistry, Charité Berlin (2025); CMFI Tübingen (2025); Israel Innovation Authority (2024); EPFL SV (2024); Institute of Microbiology, University Hospital Zurich (2023); Biotechnopolo Siena, Rappuoli group (2023); Infectious Diseases Department, University Hospital Zurich (2022); Biozentrum, Basel (2022); Institute for Microbiology and Immunology, Charité Berlin (2021); Colloque du Laboratoire des Maladies Infectieuses, CHUV, Lausanne, CH (2016); Colloque du Service de Rhumatologie, HUG, Geneva, CH (2015).