Christian Frezza

Personal Data

Title	Prof. Dr.
First name	Christian
Name	Frezza
Current position	Full Professor, permanent
Current institution(s)/site(s), country	Metabolomics in Aging / CECAD Faculty of Medicine, University of Cologne, Germany
ORCID	0000-0002-3293-7397

Qualifications and Career

Stages	Periods and Details
Doctorate	Neurobiology, 2004–2008, Prof. Luca Scorrano, School of Biosciences, University of Padua, Italy
Bachelor & Master	MSc in Medicinal Chemistry, 1997–2002, University of Padua, Italy

Stages of Academic/Professional Career

Full Professor (W3)	2021–present, Alexander von Humboldt Professor, University of Cologne, Germany
Program Leader	2017–2022, Program Leader in Cancer Metabolism MRC Cancer Unit, Hutchison/MRC Research Centre, University of Cambridge, UK
Program Leader	2012–2017, Program Leader Track MRC Cancer Unit, Hutchison/MRC Research Centre, University of Cambridge, UK
Postdoctoral Fellow	2008–2012, Prof. Eyal Gottlieb, Tumour Metabolism Department, The Beatson Institute for Cancer Research, Glasgow, UK
Research Fellow	2003–2004, Prof. Luca Scorrano, Glaucoma Research Foundation USA, Dulbecco-Telethon Institute, Venetian Institute of Molecular Medicine, Padova, Italy
Research Scientist	2002–2003, Dr. Stefano Poli and Dr. Luca Zambelli, Research & Development Laboratory, Galentis Medicinal Chemistry S.p.A., Marcon, Italy

Activities in the Research System

Institutional Responsibilities (selected)

2023–present	Coordinator, Research Area 2 “Stress Response Mechanisms of Tissue-related and Interorgan Communication in Aging and Aging-associated Diseases”, CECAD Cluster of Excellence EXC 2030 (DFG) “Cellular Stress Responses in Aging-associated Diseases”, University of Cologne, Germany
2022–present	Editorial Board Member, Cancer & Metabolism 2021–
present	Editorial Board Member, American Journal of Physiology
2019–present	Editorial Board Member, Nucleic Acid Research Cancer

2017–present	Scientific Adviser, Istesso, London, UK
2017–2022	SAB Member, Owlstone, Cambridge, UK
2013–present	Editorial Board Member, Portland Press Biochemical Journal

Service to the Scientific Community (selected)

2024	LS4 Panel Member, ERC Synergy Grants
2022	LS4 Panel Member, ERC Starting Grants
2022	Co-Chair and Co-Organizer, FEBS Ageing Meeting, Innsbruck, Austria
2022	Co-Chair and Co-Organizer, EACR Cancer Metabolism Meeting, Bilbao, Spain
2020	Co-Chair and Co-Organizer, Cancer & Metabolism Abcam Meeting, London, UK
2020	Co-Session Chair, EMBO Meeting Life 2020, Tampere, Finland (postponed due to Covid)
2020	Co-Organizer, EACR Cancer Metabolism Meeting, Bilbao, Spain (postponed due to Covid)
2019	Expert Review Panel Member, CRUK Discovery Research, UK
2019	Co-Organizer, Cambridge Metabolic Network Conference, Cambridge, UK
2018	Steering Committee Member, Cancer Prevention and Nutrition Conference, Ludwig Cancer Research, London, UK
2018	Co-Chair and Co-Organizer, Cancer & Metabolism Abcam Meeting, Cambridge, UK

Scientific Results

Category A

Moschandrea, C., Kondylis, V., Evangelakos, I., Herholz, M., Schneider, F., Schmidt, C., Yang, M., Ehret, S., Heine, M., Jaeckstein, M.Y., Szczepanowska, K., Schwarzer, R., Baumann, L., Bock, T., Nikitopoulou, E., Brodesser, S., Krüger, M., **Frezza, C.**, Heeren, J., Trifunovic, A.[#], and Pasparakis, M.[#] (2024). Mitochondrial dysfunction abrogates dietary lipid processing in enterocytes. **Nature** *625*:385–392. doi: 10.1038/s41586-023-06857-0. (open access)

Rogerson, C., Sciacovelli, M., Maddalena, L.A., Pouikli, A., Segarra-Mondejar, M., Valcarcel-Jimenez, L., Schmidt, C., Yang, M., Ivanova, E., Kent, J., Mora, A., Cheeseman, D., Carroll, J.S., Kelsey, G., and **Frezza, C.** (2023). FOXA2 controls the anti-oxidant response in FH-deficient cells. **Cell Rep** *42*:112751. doi: 10.1016/j.celrep.2023.112751. (open access)

Zecchini, V.*, Paupe, V.*, Herranz-Montoya, I., Janssen, J., Wortel, I.M.N., Morris, J.L., Ferguson, A., Chowdury, S.R., Segarra-Mondejar, M., Costa, A.S.H., Pereira, G.C., Tronci, L., Young, T., Nikitopoulou, E., Yang, M., Bihary, D., Caicci, F., Nagashima, S., Speed, A., Bokea, K., Baig, Z., Samarajiwa, S., Tran, M., Mitchell, T., Johnson, M., Prudent, J.[#], and **Frezza, C.**[#] (2023). Fumarate induces vesicular release of mtDNA to drive innate immunity. **Nature** *615*:499–506. doi: 10.1038/s41586-023-05770-w. (open access)

Sciacovelli, M.*, Dugourd, A.*, Jimenez, L.V., Yang, M., Nikitopoulou, E., Costa, A.S.H., Tronci, L., Caraffini, V., Rodrigues, P., Schmidt, C., Ryan, D.G., Young, T., Zecchini, V.R., Rossi, S.H., Massie, C., Lohoff, C., Masid, M,, Hatzimanikatis, V., Kuppe, C., Von Kriegsheim, A., Kramann, R., Gnanapragasam, V., Warren, A.Y., Stewart, G.D., Erez, A., Vanharanta, S., Saez-Rodriguez. J.[#], and **Frezza, C.**[#] (2022). Dynamic partitioning of branched-chain amino acids-derived nitrogen supports renal cancer progression. **Nat Commun** *13*:7830–7850. doi: 10.1038/s41467-022-35036-4. (open access)

Valcarcel-Jimenez, L., Rogerson, C., Yong, C., Schmidt, C., Yang, M., Harle, V., Offord, V., Wong, K., Mora, A., Speed, A., Caraffini, V., Tran, M.G.B., Maher, E.R., Stewart, G.D., Vanharanta, S., Adams, D.J., and **Frezza, C**. (2022). HIRA loss transforms FH-deficient cells. **Sci Adv** *8*:eabq8297. doi: 10.1126/sciadv.abq8297. (open access)

Gaude, E., Schmidt, C., Gammage, P.A., Dugourd, A., Blacker, T., Chew, S.P., Saez-Rodriguez, J., O'Neill, S.J., Szabadkai, G., Minczuk, M., and **Frezza, C.** (2018). NADH shuttling couples cytosolic reductive carboxylation of glutamine with glycolysis in cells with mitochondrial dysfunction. **Mol Cell** *69*:581–593. doi: 10.1016/j.molcel.2018.01.034. (open access)

Tyrakis, P.A., Yurkovich, E.M., Sciacovelli, M., Papachristou, E.K., Bridges, H.R., Gaude, E., Schreiner, A., D'Santos, C., Hirst, J., Hernandez-Fernaud, J., Springett, R., Griffiths, J.R., and **Frezza, C.** (2017). Fumarate hydratase loss causes combined respiratory chain defects. **Cell Rep** *21:*1036–1047. doi: 10.1016/j.celrep.2017.09.092. (open access)

Sciacovelli, M., Gonçalves, E., Johnson, T.I., Zecchini, V.R., da Costa. A.S., Gaude, E., Drubbel, A.V., Theobald, S.J., Abbo, S.R., Tran, M.G., Rajeeve, V., Cardaci, S., Foster, S., Yun, H., Cutillas, P., Warren, A., Gnanapragasam, V., Gottlieb, E., Franze, K., Huntly, B., Maher, E.R., Maxwell, P.H., Saez-Rodriguez, J., and **Frezza, C.** (2016). Fumarate is an epigenetic modifier that elicits epithelial-to-mesenchymal transition. **Nature** *537*:544–547. doi: 10.1038/nature19353. (open access)

Chouchani, E.T.*, Pell, V.R.*, Gaude, E., Aksentijević, D., Sundier, S.Y., Robb, E.L., Logan, A., Nadtochiy, S.M., Ord, E.N.J., Smith, A.C., Eyassu, F., Shirley, R., Hu, C.H., Dare, A.J., James, A.M., Rogatti, S., Hartley, R.C., Eaton, S., Costa, A.S.H., Brookes, P.S., Davidson, S.M., Duchen, M.R., Saeb-Parsy, K., Shattock, M.J., Robinson, A.J., Work, L.M., **Frezza, C**.[#], Krieg, T.[#], and Murphy, M.P.[#] (2014). Ischaemic accumulation of succinate controls reperfusion injury through mitochondrial ROS. **Nature** *515*:431–435. doi: 10.1038/nature13909. (open access)

Frezza, C., Zheng, L., Folger, O., Rajagopalan, K.N., MacKenzie, E.D., Jerby, L., Micaroni, M., Chaneton, B., Adam, J., Hedley, H., Kalna, H., Tomlinson, I.P.M., Pollard, P.J., Watson, D.G., Deberardinis, R.J., Shlomi, T., Ruppin, E., and Gottlieb, E. (2011). Haem oxygenase is synthetically lethal with the tumour suppressor fumarate hydratase. **Nature** *477*:225–228. doi: 10.1038/nature10363. (open access)

** shared first authorship, [#] shared corresponding authorship*

Category B

Preprints, Reviews, and Commentaries (Non-peer-reviewed, selected)

Kamp, M., Surmacki, J., Segarra Mondejar, M., Young, T., Chrabaszcz, K., Joud, F., Zecchini, V., Speed, A., **Frezza, C.**[#], and Bohndiek, S.E.[#] (2023) Raman micro-spectroscopy reveals the spatial distribution of fumarate in cells and tissues. **bioRxiv**. doi: 10.1101/2023.07.02.547209.

Pouikli, A., and **Frezza, C.** (2023). Metabolic control of antitumor immunity. **Science** *381*:1287–1288. doi: 10.1126/science.adk1785.

Patents

Inventors:	Pluchino, S., **Frezza, C**., Gaude, E., Leonardi, T., and Iraci, N. (Cambridge Innovation Technolgies Consulting Limited, UK)
No.:	WO 2018/050918 A1 (2018)
Title:	Human asparaginase lacking glutaminase activity
Inventors:	E. Ruppin, Shlomi, T., Folger, O., Gottlieb, E., and **Frezza, C.** (Ramot at Tel-Aviv University Ltd, IL, Cancer Research Technology Limited, Glasgow, UK)
No.:	US 20160300010 A1 (2016)
Title:	Method and system for predicting selective cancer drug targets

Inventors:	Murphy, M.P., Work, L., and **C. Frezza** (MRC, University of Glasgow, UK)
No.:	WO 2016001686 A1 (2016)
Title:	Succinate dehydrogenase inhibitors (sdhi's)

Public Outreach Activities (selected)

2024	CECAD Primary School Event "Everyone is a Scientist", Cologne, Germany
2022	KinderUni, "What is cancer? A journey through our body." University of Cologne, Germany

Academic Distinctions

2024–2028	Partner, Marie Skłodowska-Curie Innovative Training Networks (EU)
2024	Invited Speaker, President's Lecture Series, La Jolla, CA, USA
2024	Invited Speaker, 2023–24 UCLA Distinguished Speaker Metabolism Research Theme/CTSI Seminar Series, Los Angeles, CA, USA
2023	Highly Cited Researcher (Web of Science)
2021	Alexander von Humboldt Professorship, Alexander von Humboldt Foundation
2019	Cancer Research UK Programme Foundation Award (CRUK)
2019	ERC Consolidator Grant
2016–2019	Partner, Marie Skłodowska-Curie Innovative Training Networks (EU)
2016	Cambridge Cancer Centre Pump Priming Award
2014	Worldwide Cancer Research Grant (AICR)
2013	Cambridge Cancer Centre Pump Priming Award
2012	Medical Research Council Centenary Award (MRC)
2008–2010	EMBO Long-Term Fellowship