CURRICULUM VITAE

Gyorgy Szabadkai, MD, PhD

Academic Appointments:

2015 -	**Professor of Physiology,** Department of Cell and Developmental Biology, Faculty of Life Sciences, University College London, UK;
2014-	**Associate Professor**, Department of Biomedical Sciences, University of Padua, Padua, Italy
2017-2020	**Satellite Group Leader**, Francis Crick Institute
2007-2015	**Senior Lecturer,** Department of Cell and Developmental Biology, Faculty of Life Sciences, University College London, UK

Education and Training:

1987-1993	**MD**, Semmelweis University Medical School, Budapest, Hungary
1994-2000	**PhD** in Cell Biology, Semmelweis University Medical School, Budapest, Hungary
2000-2002	**Postdoctoral research fellow**, Marie Curie Training Fellowship, University of Ferrara, Department of Experimental and Diagnostic Medicine, Section of General Pathology, *Supervisor:* Rosario Rizzuto, MD, Ph.D.
2003-2006	**Research Fellow,** Telethon Center for Cellular Imaging, University of Ferrara, Department of Experimental and Diagnostic Medicine,
2006-2007	**Senior Postdoctoral Fellow** 'Poste Vert', Unité INSERM U807, Paris, France, *Director*: Patrizia Paterlini-Brechot, MD, Ph.D.

Professional Activities

Memberships: Hungarian Physiological Society (MET, 1993); Federation of European Biochemical Society (FEBS, 1993); Young Investigator Award, University of Ferrara, (2000); European Life Science Organization (ELSO 2004-); Member of the AAAS (2006); Biochemical Society (London, 2005), Physiological Society (2009), Biophysical Society (2010), United Mitochondrial Disease Society (2010); European Calcium Society (2011). Fellow of Royal Society of Biology (2014). Co-founder of the Consortium for Mitochondrial Research at University College London (2009), International Society of Cancer Metabolism (2016) – President elect (2021)

Editorial activity: Editor of Scientific Reports, Frontiers of Oncology, Molecular and Cellular Oncology and PeerJ. Reviewer for funding bodies (Medical Research Council, Wellcome Trust, Biochem. Biophys. Research Council, Cancer Research UK) and many high impact journals, including Nature, Nature Cell Biology, EMBO Journal, Journal of Clinical Investigation, Cell Death and Differentiation.

Meetings organized: Abcam/UCL CfMR Mitochondrial Symposia Series in London: Mitochondria and the CNS (2012); Mitochondria in cardiovascular and metabolic disease (2013); Mitochondria, Energy Metabolism and Cancer (2014, 2015, 2016, 2017); Joint Anglo-Israeli Mitochondrial Meeting, Tel-Aviv, Israel (2013); The UIMD School of Pharmacy, New Concepts and Strategies for Neuroprotection (2012), Santander, Spain; International Society of Cancer Metabolism (7^{th}, 8^{th} Annual Meeting Webinar Series, 2020, 2021)

Previous and Current Grant Support

UCL, London, UK

- *Parkinson's UK, G-0905. Project Grant, 2009-2012. £262,300. PI; Title: DJ-1 in mitochondrial cell death.*
- *Glaxo SmithKline, 2011. £35,000. PI. Pilot grant to explore the role and pharmacological properties of the mitochondrial Renin-Angiotensin System.*
- *Eisai UK Ltd. funded PhD studentship 09/12-08/2015; £115,000 Co-PI with Michael Duchen. Defining the role of mitochondrial calcium uptake - a potential therapeutic target in neurodegenerative disease and cancer.*
- *Therapeutic Innovation Fund, University College London – NHS National Institute of Health Research, UK – Wellcome Trust. 2012-13. Pilot Grant £50,000. Identification of a membrane permeable inhibitor of the mitochondrial Ca2+ uniporter.*
- *COMPLeX UCL/British Heart Foundation PhD studentship 2012-2015 (£130,000; stipend and consumables)*
- *Eisai UK Ltd. - UCL Therapeutic Innovation Group, Drug Development Research Grant 2013-2016 (£750,000). To develop mitochondria targeting drugs for novel treatments of neurodegenerative disease and cancer.*
- *Biochemical and Biophysical Research Council. Project Grant. 2014-2017. In situ quantification of metabolic function using fluorescence lifetime imaging; £507,800; CoI (M. Duchen).*
- *Wellcome Trust Pathfinder Award. 2016-2018. £205,000. Mitochondrial profiling of breast cancer. PI.*

- *Biochemical and Biophysical Research Council. Project Grant. 2017-2020. New approaches to studying redox metabolism using time-resolved NAD(P)H fluorescence and anisotropy; £574,161; CoI (A. Bain).*
- Cancer Research UK, Grand Challenge Award. 2018-2023. Total award to Consortium ('A complete cartography of cancer through multiscale molecular imaging', PI: J. Bunch) £15M; Role: Collaborator at UCL-Crick, awarded £255,000.
- Cancer Research UK, Pioneer Award. 2020-2023. Specific targeting of tumour mitochondrial DNA for cancer gene therapy. £195,700: PI
- British Heart Foundation, Research project, 2019-2023. Novel Targets In The Final Common Pathway Of Necrosis During Ischemia Reperfusion Injury. £228,217: PI

University of Padua, Italy

- *Telethon Exploratory Grants, Italy, University of Padua. 2012-13 € 49,500; The Role of Inositol 1,4,5-trisphosphate Mediated Nuclear Ca2+ Signals In Core Myopathies*
- *AIRC, Associazione Italiana per la Ricerca sul Cancro, Investigator Grant. Italy, University of Padua. 2013-2016. €354,550 Title: Inhibition of hepatocellular tumor formation by modulating mitochondrial biogenesis.*
- AIRC, Associazione Italiana per la Ricerca sul Cancro, Investigator Grant. Italy, University of Padua. 2019-2024. €599,000 Title: "Exploiting mitochondrial biogenesis pathways to stratify and target different breast cancer subtypes",
- Ministry of Health, The Role of Mitochondrial Ca^{2+} Signals In Core Myopathies, 2015-2020, PI, €430,000
- Telethon Research Grant, 2017-2020, €365,000; Targeting mitochondria in myopathies with RyR1 and MICU1 mutations. PI

Selected publications

ISI citation report: 137 publications (cited 20,203 times w/o self, **h-index: 50**), 4 book chapters, 1 patent.

1. Menegollo Michela, Robert B. Bentham, Tiago Henriques, Seow Q. Ng, Ziyu Ren, Clarinde Esculier, Sia Agarwal, et al. **"Multistate Gene Cluster Switches Determine the Adaptive Mitochondrial and Metabolic Landscape of Breast Cancer."** Cancer Research 84, 2024: 2911–25.
2. Alzaydi, Mai M., Vahitha B. Abdul-Salam, Harry J. Whitwell, Giusy Russomanno, Angelos Glynos, Daria Capece, Gyorgy Szabadkai, Martin R. Wilkins, and Beata Wojciak-Stothard. **"Intracellular Chloride Channels Regulate Endothelial Metabolic Reprogramming in Pulmonary Arterial Hypertension."** American Journal of Respiratory Cell and Molecular Biology 68, no. 1 2023: 103–15.
3. Chung, Chih-Yao, Kritarth Singh, Preethi Sheshadri, Gabriel E. Valdebenito, Anitta R. Chacko, María Alicia Costa Besada, Xiao Fei Liang, et al. **"Inhibition of the PI3K-AKT-MTORC1 Axis Reduces the Burden of the m.3243A>G mtDNA Mutation by Promoting Mitophagy and Improving Mitochondrial Function."** Autophagy, 2024, 1–16.
4. Chung CY, Singh K, Kotiadis VN, Valdebenito GE, Ahn JH, Topley E, Tan J, Andrews WD, Bilanges B, Pitceathly RDS, Szabadkai G, Yuneva M, Duchen MR. 2021. **"Constitutive activation of the PI3K-Akt-mTORC1 pathway sustains the m.3243 A > G mtDNA mutation."** Nat Commun. 12(1):6409.
5. De Mario A, Tosatto A, Hill JM, Kriston-Vizi J, Ketteler R, Vecellio Reane D, Cortopassi G, Szabadkai G, Rizzuto R, Mammucari C. 2021. **"Identification and functional validation of FDA-approved positive and negative modulators of the mitochondrial calcium uniporter."** Cell Rep. 35(12):109275.
6. Desai R, East DA, Hardy L, Faccenda D, Rigon M, Crosby J, Alvarez MS, Singh A, Mainenti M, Hussey LK, Bentham R, Szabadkai G, Zappulli V, Dhoot GK, Romano LE, Xia D, Coppens I, Hamacher-Brady A, Chapple JP, Abeti R, Fleck RA, Vizcay- Barrena G, Smith K, Campanella M. 2020 **"Mitochondria form contact sites with the nucleus to couple prosurvival retrograde response"**. Sci Adv; 6(51):eabc9955".
7. Xu R, Jones W, Wilcz-Villega E, Costa AS, Rajeeve V, Bentham RB, Bryson K, Nagano A, Yaman B, Olendo Barasa S, Wang Y, Chelala C, Cutillas P, Szabadkai G, Frezza C, Bianchi K. 2020. **"The breast cancer oncogene IKKε coordinates mitochondrial function and serine metabolism"**. EMBO Rep. 3;21(9):e48260.
8. Abeyakoon O, Latifoltojar A, Gong F, Papoutsaki MV, Chowdhury R, Glaser M, Jeraj H, Awais R, Holt C, Twyman F, Arstad E, Gadian DG, Atkinson D, Comment A, O'Callaghan J, Smith L, Beeston T, Clemente J, Patani N, Stein R, Yuneva M, Szabadkai G, Halligan S, Punwani S. 2019 "**Hyperpolarised 13C MRI: a new horizon for non-invasive diagnosis of aggressive breast cancer**". BJR Case Rep. 5(3):20190026
9. Blacker, Thomas S., Michael D. E. Sewell, Gyorgy Szabadkai, and Michael R. Duchen. 2019. "**Metabolic Profiling of Live Cancer Tissues Using NAD(P)H Fluorescence Lifetime Imaging.**" Pp. 365–87 in Methods in molecular biology (Clifton, N.J.). Vol. 1928.
10. Plotegher N, Perocheau D, Ferrazza R, Massaro G, Bhosale G, Zambon F, Rahim AA, Guella G, Waddington SN, Szabadkai G, Duchen MR. 2020 **"Impaired cellular bioenergetics caused by GBA1 depletion sensitizes neurons to calcium overload."** Cell Death Differ. 27(5):1588-1603.
11. Thomas, Luke W., Cinzia Esposito, Jenna M. Stephen, Ana S. H. Costa, Christian Frezza, Thomas S. Blacker, Gyorgy Szabadkai, and Margaret Ashcroft. 2019. "**CHCHD4 Regulates Tumour Proliferation and EMT-Related Phenotypes, through Respiratory Chain-Mediated Metabolism**." Cancer & Metabolism 7(1):7.
12. Briston, Thomas, David L. Selwood, Gyorgy Szabadkai, and Michael R. Duchen. 2019. "**Mitochondrial Permeability Transition: A Molecular Lesion with Multiple Drug Targets**." Trends in Pharmacological Sciences 40(1):50–70.
13. Briston, Thomas, Jenna M. Stephen, Luke W. Thomas, Cinzia Esposito, Yuen-Li Chung, Saiful E. Syafruddin, Mark Turmaine, Lucas A. Maddalena, Basma Greef, Gyorgy Szabadkai, Patrick H. Maxwell, Sakari Vanharanta, and Margaret Ashcroft. 2018. "**VHL-Mediated Regulation of CHCHD4 and Mitochondrial Function**." Frontiers in Oncology 8(OCT):388.

14. Suman, Matteo, Jenny A. Sharpe, Robert B. Bentham, Vassilios N. Kotiadis, Michela Menegollo, Viviana Pignataro, Jordi Molgó, Francesco Muntoni, Michael R. Duchen, Elena Pegoraro, and Gyorgy Szabadkai. 2018. "**Inositol Trisphosphate Receptor-Mediated Ca2+ Signalling Stimulates Mitochondrial Function and Gene Expression in Core Myopathy Patients**." Human Molecular Genetics 27(13):2367–82.
15. Gaude, Edoardo, Christina Schmidt, Payam A. Gammage, Aurelien Dugourd, Thomas Blacker, Sew Peak Chew, Julio Saez-Rodriguez, John S. O'Neill, Gyorgy Szabadkai, Michal Minczuk, and Christian Frezza. 2018. "**NADH Shuttling Couples Cytosolic Reductive Carboxylation of Glutamine with Glycolysis in Cells with Mitochondrial Dysfunction.**" Molecular Cell 69(4):581-593.e7.
16. R. B. Bentham, K. Bryson, and G. Szabadkai, **MCbiclust: a novel algorithm to discover large-scale functionally related gene sets from massive transcriptomics data collections** *Nucleic Acids Res.*, 2017, 45, 8712–8730
17. B. Bilanges, S. Alliouachene, W. Pearce, D. Morelli, G. Szabadkai, Y.L. Chung, G. et al, Vps34 PI 3-kinase inactivation enhances insulin sensitivity through reprogramming of mitochondrial metabolism, *Nat. Commun*. 8 (2017).
18. T. Briston, M. Roberts, S. Lewis, B. Powney, J. M Staddon, G. Szabadkai, M.R. Duchen, **Mitochondrial permeability transition pore: sensitivity to opening and mechanistic dependence on substrate availability**., *Sci. Rep*.; 7; 10492. 2017.
19. G. Bhosale, J. A. Sharpe, A. Koh, A. Kouli, G. Szabadkai*, and M. R. Duchen*, **Pathological consequences of MICU1 mutations on mitochondrial calcium signalling and bioenergetics** *Biochim. Biophys. Acta*, pp. 1–9, Jan. 2017. *shared senior authorship
20. Tosatto A, Sommaggio R, Kummerow C, Bentham RB, Blacker TS, Berecz T, Duchen MR, Rosato A, Bogeski I, Szabadkai G, Rizzuto R, Mammucari C. **The mitochondrial calcium uniporter regulates breast cancer progression via HIF-1α.** *EMBO Mol Med* 2016, **8**:569–85.
21. Blacker T, Mann Z, Gale J, Ziegler M, Bain A, Szabadkai G*, Duchen MR*: **Separating NADH and NADPH fluorescence in live cells and tissues using FLIM**. *Nat Commun* 2014, **5:** 3936-9. (PMID 24874098; PMCID: PMC4046109) *shared senior authorship
22. Logan CV*, Szabadkai G*, Sharpe JA*, Parry DA, Torelli S, Childs A-M, Kriek M, Phadke R, Johnson CA, Roberts NY, Bonthron DT, Pysden KA, Whyte T, Munteanu I, Foley AR, et al.: **Loss-of-function mutations in MICU1 cause a brain and muscle disorder linked to primary alterations in mitochondrial calcium signaling.** *Nat Genet* 2014, **46**:188–93. (PMID 24336167) *shared first authorship
23. Hill JM, De Stefani D, Jones AWE, Ruiz A, Rizzuto R, Szabadkai G: **Methods to Measure Baseline Ca2+ Levels with Organelle-Targeted Recombinant Fluorescent Probes**. *Methods Enzymol* 2014, **543:**47-72.
24. Dalton CM, Szabadkai G, Carroll J: **Measurement of ATP in single oocytes: impact of maturation and cumulus cells on levels and consumption.** *J Cell Physiol* 2014, **229**:353–61.

Patent:

'Quinolium conjugates of cyclosporine with mitochondrial targeting for the treatment of a disease or disorder susceptible for amelioration by inhibition of cyclophilin D'; International (PCT/GB2015/052412), US (15/505006).