Mário Tyago Murakami
Director
Brazilian Biorenewables National Laboratory (LNBR)
Brazilian Center for Research in Energy and Materials (CNPEM)

Murakami has broad experience in the coordination of large-scale national infrastructure and facilities (such as synchrotron beamlines), scientific divisions (equivalent to university departments), R&D projects with private biotechnology companies, and long-term interdisciplinary scientific projects. Since 2018, Murakami has been leading the scientific program of the Brazilian Biorenewables National Laboratory (LNBR), which encompasses over 180 scientific staff, including researchers, assistant scientists, analysts, and technicians. As scientist, Murakami contributed to the elucidation of novel molecular mechanisms governing the function of a number of enzymes with biomedical and biotechnological relevance resulting in publications in Journals like *Nature, Nature Chemical Biology* and *Nature Communications*. In addition, Murakami is leading a national program for the establishment of a large-scale production of enzyme cocktails for Brazilian biorefineries, which is pivotal for the transition to a sustainable bio-based economy. In 2024, Murakami was appointed as the Vice-President of the Brazilian Technical Commission on Biosafety (CTNBio).

Education/training

Year Term	Title or activity	Institution	Title of work
2013	Habilitation in Biotechnology	UNICAMP, Campinas	Molecular strategies for catalysis, regulation and stability of glycosidic hydrolases with potential biotechnological applications
2012-2012 (2m)	Sabbatical in Biomolecular NMR	Rutgers University (USA), Prof. Dr. Kalodimos Charalampos	Biomolecular Nuclear Magnetic Resonance (NMR)
2006-2007 (9m)	Postdoc in Macromolecular Crystallography	IBILCE/UNESP, Prof. Dr. Raghuvir Krishnaswamy Arni	Functional and structural aspects of sphingomyelinases of proteins isolated from southern bean mosaic virus involved in movement and replication
2005-2006 (8m)	Sandwich doctorate	University of Hamburg (GER), Prof. Christian Betzel	Inhibition strategies, molecular mechanisms and intermolecular interactions in macromolecular complexes
2004-2006 (36m)	PhD in Molecular Biophysics	IBILCE/UNESP, Prof. Dr. Raghuvir Krishnaswamy Arni	Strategies of inhibition and interactions in macromolecular complexes
1999-2003 (48m)	Food Engineer	IBILCE/UNESP, Prof. Dr. Raghuvir Krishnaswamy Arni	Structure and function of hemostatically-active proteases

Professional history

Year	Position	Organization
2025-current	Director	LNBR/CNPEM
2024-current	Vice-President of the Brazilian Biosafety Technical Commission (CTNBio)	MCTI
2018-2025	Scientific Director	LNBR/CNPEM
2018-current	Coordinator of the Molecular Biotechnology Division	LNBR/CNPEM
2017-2018	Coordinator of the Molecular Division	CTBE/CNPEM
2009-2016	Coordinator of the Crystallization Facility (Robolab)	LNBio/CNPEM
2009-2016	Coordinator of the Crystallography beamline MX2	LNLS/CNPEM
2008-2009	Coordinator of the Crystallography beamline MX1	LNLS/CNPEM
2008-current	Principal Investigator	LNBio/CNPEM
2007-2008	Assistant Professor	IBILCE/UNESP

Honors and awards

Year	Awards or Academic Distinctions	Institution
2023	EMBRAPII Researcher award in innovation by the Brazilian Agency of Innovation (EMBRAPII)	*EMBRAPII*
2023	Study describing the *Bifidobacterium* machinery for N-glycan processing published in *Nature Chemical Biology* was the Editor-in-Chief´s pick featuring an article written by Prof. Lucy I. Crouch (University of Birmingham)	*Nature Chemical Biology*
2021-current	Productivity in Research Scholarship level 1B	The Brazilian National Council for Scientific and Technological Development (CNPq)
2020	Member of the Brazilian Academy of Sciences	Brazilian Academy of Sciences
2020	Work describing a novel hydrolase family published in *Nature Chemical Biology* was the Editor-in-Chief´s pick featuring an article written by Prof. Paul H. Walton (University of York)	*Nature Chemical Biology*
2013 – 2020	Productivity in Research Scholarship level 1D	CNPq
2009 – 2012	Productivity in Research Scholarship level 2	CNPq
2006	Winner of the X Young Talent Award in Life Sciences	The Brazilian Society for Biochemistry and Molecular Biology (SBBq)
2005	PhD thesis selected as Six Top choices	*American Crystallographic Association*
1997	Highlight of the Regional Mathematics Olympics	UNESP

Active grants

Title	Coordinator	Term	Funding Agency
5-year Thematic project: Enzymatic mechanisms from the microbiome of aquatic herbivores for depolymerization and metabolism of complex carbohydrates.	**Mario T. Murakami**	**02/01/2023 a 31/12/2028**	**FAPESP (2015/26982-0)**

Selected publications in the last 5 years as corresponding author

1. Santos CA, Morais MAB, Mandelli F, Lima EA, Miyamoto RY, Higasi PMR, Araujo EA, Paixão DAA, Junior JM, Motta ML, Streit RSA, Morão LG, Silva CBC, Wolf LD, Terrasan CRF, Bulka NR, DIOGO JA, Fuzita FJ, Colombari FM, Santos RC, Rodrigues PT, Silva DB, Grisel S, Bernardes JS, Terrapon N, Lombard V, Filho AJC, Henrissat B, Bissaro B, Berrin JG, Persinoti GF, **Murakami MT**. A metagenomic 'dark matter' enzyme catalyses oxidative cellulose conversion. **Nature**, v. 639, p. 1076-1083, 2025. Impact Factor: 50.5

2. Cordeiro RL, Santos CR, Domingues MN, Lima TB, Pirolla RAS, Morais MAB, Colombari FM, Miyamoto RY, Persinoti GF, Borges AC, de Farias MA, Stoffel F, Li C, Gozzo FC, van Heel M, Guerin ME, Sundberg EJ, Wang LX, Portugal RV, Giuseppe PO, **Murakami MT.** Mechanism of high-mannose N-glycan breakdown and metabolism by *Bifidobacterium longum***. Nature Chemical Biology**, v. 19, p. 218-229, 2023. Impact Factor: 14.7.

3. Cabral L, Persinoti GF, Paixão DAA, Martins MP, Morais MAB, Chinaglia M, Domingues MN, Sforca ML, Pirolla RAS, Generoso WC, Santos CA, Maciel LF, Terrapon N, Lombard V, Henrissat B, **Murakami MT**. Gut microbiome of the largest living rodent harbors unprecedented enzymatic systems to degrade plant polysaccharides. **Nature Communications**, v. 13, p. 629, 2022. Impact Factor: 16.1.

4. Vieira PS, Bonfim IM, Araujo EA, Melo RR, Lima AR, Fessel MR, Paixão DAA, Persinoti GF, Rocco SA, Lima TB, Pirolla RAS, Morais MAB, Correa JBL, Zanphorlin LM, Diogo JA, Lima EA, Grandis A, Buckeridge MS, Gozzo FC, Benedetti CE, Polikarpov I, Giuseppe PO, **Murakami MT**. Xyloglucan processing machinery in Xanthomonas pathogens and its role in the transcriptional activation of virulence factors. **Nature Communications**, v. 12, p. 4049, 2021. Impact Factor: 16.1.

5. Morais MAB, Coines J, Domingues MN, Pirolla RAS, Tonoli CCC, Santos CR, Correa JBL, Gozzo FC, Rovira C, **Murakami MT**. Two distinct catalytic pathways for GH43 xylanolytic enzymes unveiled by X-ray and QM/MM simulations. **Nature Communications**, v. 12, p. 367, 2021. Impact Factor: 16.1.

6. Santos CR, Costa PACR, Vieira PS, Gonzalez SET, Correa TLR, Lima EA, Mandelli F, Pirolla RAS, Domingues MN, Cabral L, Martins MP, Cordeiro RL, Junior AT, Souza BP, Prates ÉT, Gozzo FC, Persinoti GF, Skaf MS, **Murakami MT**. Structural insights into β-1,3-glucan cleavage by a glycoside hydrolase family. **Nature Chemical Biology**, v. 16, p. 920-929, 2020. Impact Factor: 14.7.

Academic quantitative indicators

Item	Qty
Peer-reviewed manuscripts indexed in Web of Science	171
Book chapters	4
Filed Patents	15
Master students supervised	8
PhD students supervised	17
Postdocs supervised	16
Citations (Google Scholar)	6450
h-index (Google Scholar)	45
i10-index (Extraído do Google Scholar)	133
Structures deposited at PDB	215

Links

ORCID: https://orcid.org/0000-0002-0405-8010
Google Scholar: https://scholar.google.com.br/citations?user=Ff5cpsUAAAAJ&hl=en
Lattes: http://lattes.cnpq.br/2119882299651306