CURRICULUM VITAE February 2025

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1749-016 Lisboa. Portugal

BIOGRAPHICAL NOTE

Assistant Professor at FCUL. Scientist with a strong expertise in microscopy, high content screening, cell biology, biochemistry and biophysics. Cystic Fibrosis researcher. Co-responsible for FCUL Microscopy Facility, manager of the High-Throughput Screening Facility from BioISI / FCUL. Bioimage analyst, software developer, data scientist, trainer and academic supervisor.

MAIN SKILLS

Cystic Fibrosis	CFTR traffic and folding; Cystic Fibrosis cellular models; therapeutic target identification.
Management	Manager of High-Throughput Screening Facility (BioISI/FCUL); Scientific supervision; Project management.
Microscopy	High-content microscopy screening. Widefield and confocal fluorescence.
Bioimage analysis	Quantification and feature extraction from microscopy images (ImageJ, CellProfiler).
Cell Biology	Assay design; Eukaryotic and prokaryotic cell culture; RNA interference; Membrane trafficking.
Data Science	Statistical analysis of microscopy screening datasets. Data visualization, exploration and normalization.
Software development	R and ImageJ. Standalone scripts, libraries and web applications.
Training	Organization of courses and training sessions on microscopy, screening and image analysis.
Biochemistry	Protein expression, purification and characterization; Liquid chromatography; SDS-PAGE; Western blot; Proteomics.
Biophysics	Spectroscopy (UV-visible Absorption, Fluorescence Emission, Circular Dichroism, FT-IR, Dynamic Light Scattering); Protein folding, misfolding and aggregation; Thermodynamics; Protein aggregation; Electrochemistry.

EDUCATION

2010 **PhD in Biochemistry**. Specialization: Biophysics. ITQB / Universidade Nova de Lisboa.
Approved by unanimity
Supervisor: Cláudio M. Gomes
Thesis title: Protein folding and metal ions – Conformational and functional interplay

2006 **Degree in Biochemistry** (Licenciatura, pre-Bologna). Faculty of Sciences, University of Lisboa.
Mark: 18/20
Supervisor: Cláudio M. Gomes
Thesis title: Pesquisa, identificação e caracterização de proteínas hiperestáveis no proteoma solúvel da archaea hipertermofílica *Sulfurisphaera sp. [Search, identification and characterization of hyperstable proteins in the soluble proteome of the hyperthermophilic archaea Sulphurisphaera sp.]*

SCIENTIFIC APPOINTMENTS

2024, Dec - today	**Assistant Professor**, Department of Chemistry and Biochemistry, FCUL.
2023, Dec - today	**Chair of Bioimage Analysis Working Group, PPBI**
2019, Jul - today	**Facility Manager**, High-Throughput Screening Facility. BioISI, FCUL.
2019, Jul - today	**Co-Responsible**, FCUL Microscopy Facility, FCUL.

PUBLICATIONS

***h*-index:** 16

Online publication list and statistics:

http://www.researcherid.com/rid/B-3092-2008
http://orcid.org/0000-0002-4208-1086
https://www.researchgate.net/profile/Hugo_Botelho
https://www.scopus.com/authid/detail.url?authorId=15030102200
http://www.linkedin.com/pub/hugo-botelho/27/5b9/b60
http://scholar.google.com/citations?user=nXftyYwAAAAJ
https://www.cienciavitae.pt/portal/E218-E579-24C1

Papers in international peer reviewed journals

1. Botelho HM, Lopes-Pacheco M, Pinto MC, Railean V, Pankonien I, Caleiro MF, Clarke LA, Cachatra V, Neumann B, Tischer C, Moiteiro C, Ousingsawat J, Kunzelmann K, Pepperkok R, Amaral MD (2025) **Global Functional Genomics Reveals GRK5 as a Cystic Fibrosis Therapeutic Target Synergistic with Current Modulators**. *iScience*. *In press*. DOI: 10.1016/j.isci.2025.111942 (IF: 4.6, 2022)
2. Coelho M, Duarte AP, Pinto S, Botelho HM, Reis CP, Serralheiro ML, Pacheco R (2023) **Edible seaweeds extracts: characterization and functional properties for health conditions**. *Antioxidants.* 12(3), 684. DOI: 10.3390/antiox12030684 (IF: 6.0)
3. Godinho-Pereira J, Lopes MD, Garcia AR, Botelho HM, Malhó R, Figueira I, Brito MA (2022) **A drug screening reveals minocycline hydrochloride as a therapeutic option to prevent breast cancer cells extravasation across the blood-brain barrier**. *Biomedicines*. 10(8):1988. DOI: 10.3390/biomedicines10081988 (IF: 4.7)
4. Ferreira FF, Silva IAL, Botelho HM, Amaral MD, Farinha CM (2022) **Absence of EPAC1 signaling to stabilize CFTR in intestinal organoids**. *Cells*. 11(15):2295. DOI: 10.3390/cells11152295 (IF: 6.0)
5. Fernandes C, Palma E, Silva F, Belchior A, Pinto CIJ, Guerreiro JF, Botelho HM, Mendes F, Raposinho P, Paulo A (2022) **Searching for a Paradigm Shift in Auger-Electron Cancer Therapy with Tumor-Specific Radiopeptides Targeting the Mitochondria and/or the Cell Nucleus**. *Int J Mol Sci*. 23(13):7238. DOI: 10.3390/ijms23137238 (IF: 5.6)
6. Quaresma MC, Botelho HM, Pankonien I, Rodrigues CS, Pinto MC, Costa PR, Duarte A, Amaral MD (2022) **Exploring YAP1-centred networks linking dysfunctional CFTR to epithelial-mesenchymal transition**. *Life Sci Alliance*. 5(9):e202101326. DOI: 10.26508/lsa.202101326 (IF 4.4)
7. Lim SH, Snider J, Birimberg-Schwartz L, Ip W, Serralha JC, Botelho HM, Lopes-Pacheco M, Pinto MC, Moutaoufik MT, Zilocchi M, Laselva O, Esmaeili M, Kotlyar M, Lyakisheva A, Tang P, Vázquez LL, Akula I, Aboualizadeh F, Wong V, Grozavu I, Opacak-Bernardi T, Yao Z, Mendoza M, Babu M, Jurisica I, Gonska T, Bear C, Amaral MD, Stagljar I (2022) **CFTR interactome mapping using the Mammalian Membrane Two-Hybrid High-Throughput Screening system**. *Mol Syst Biol*, 18:e10629. DOI: 10.15252/msb.202110629 (IF 9.9)
8. Pinto MC, Botelho HM, Silva IAL, Railean V, Neumann B, Pepperkok R, Schreiber R, Kunzelmann K, Amaral MD (2022) **Systems Approaches to Unravel Molecular Function: High-content siRNA Screen Identifies**

TMEM16A Traffic Regulators as Potential Drug Targets for Cystic Fibrosis. *J Mol Biol*, 434(5):167436. DOI: 10.1016/j.jmb.2021.167436 (IF 5.6)

9. Hagemeijer MC, Vonk AM, Awatade NT, Silva IAL, Tischer C, Hilsenstein V, Beekman JM, Amaral MD, Botelho HM (2020) **An open-source high-content analysis workflow for CFTR function measurements using the forskolin-induced swelling assay**. *Bioinformatics*, 36(24): 5686-5694. DOI: 10.1093/bioinformatics/btaa1073 (IF 6.937)

10. Silva IAL, Dousŏvá T, Ramalho S, Centeio R, Clarke LA, Railean V, Botelho HM, Holubová A, Valášková I, Yeh J-T, Hwang T-C, Farinha CM, Kunzelmann K, Amaral MD (2020) **Organoids as a Personalized Medicine Tool for Ultra-Rare Mutations in Cystic Fibrosis: the Case of S955P and 1717-2A>G**. *Biochim Biophys Acta – Mol Basis Dis,* 1866, 165905. DOI: 10.1016/j.bbadis.2020.165905 (IF 5.187)

11. Uliyakina I, da Paula AC, Afonso S, Lobo MJ, Felício V, Botelho HM, Farinha CM, Amaral MD (2020) **Full rescue of F508del-CFTR processing and function by CFTR modulators can be achieved by removal of two regulatory regions**. *Int J Mol Sci,* 21(12): 4524. DOI: 10.3390/ijms21124524 (IF 5.924)

12. Amaral MD, Hutt DM, Tomati V, Botelho HM, Pedemonte N (2019) **CFTR processing, trafficking and interactions**. *J Cyst Fibros*, S1569-1993(19)30932-30934. DOI: 10.1016/j.jcf.2019.10.017 (IF 4.759)

13. Santos JD, Canato S, Carvalho AS, Botelho HM, Aloria K, Amaral MD, Matthiesen R, Falcão AO, Farinha CM (2019) **Folding status is determinant over traffic-competence in defining CFTR interactors in the endoplasmic reticulum**. *Cells,* 8(4): 353. DOI: 10.3390/cells8040353 (IF 4.366)

14. Palma E, Botelho HM, Morais GR, Rodrigues I, Santos IC, Campello MPC, Raposinho P, Belchior A, Gomes SS, Araújo MF, Correia I, Ribeiro N, Gama S, Mendes F, Paulo A (2019) **Unravelling the antitumoral potential of novel bis(thiosemicarbazonato) Zn(II) complexes: structural and cellular studies**. *J Biol Inorg Chem,* 24: 71-89. DOI: 10.1007/s00775-018-1629-6 (IF 3.246)

15. Awatade NT, Ramalho S, Silva IAL, Felício V, Botelho HM, de Poel E, Vonk A, Beekman JM, Farinha CM, Amaral MD (2018) **R560S: a class II CFTR mutation that is not rescued by current modulators**. *J Cyst Fibros,* 18(2):182-189. DOI: 10.1016/j.jcf.2018.07.001 (IF 4.29)

16. Cristóvão JS, Morris VK, Cardoso I, Leal SS, Martinez J, Botelho HM, Göbl C, David R, Kierdorf K, Alemi M, Madl T, Fritz G, Reif B, Gomes CM (2018) **The neuronal S100B protein is a calcium-tuned suppressor of amyloid-β aggregation**. *Sci Adv,* 4(6): eaaq1702. DOI: 10.1126/sciadv.aaq1702 (IF 12.804)

17. Lérias JR*, Pinto MC*, Botelho HM, Awatade NT, Quaresma MC, Silva IAL, Wanitchakool P, Schreiber R, Pepperkok R, Kunzelmann K, Amaral MD (2018) **A novel microscopy-based assay identifies extended synaptotagmin-1 (ESYT1) as a positive regulator of anoctamin 1 traffic**. *Biochim Biophys Acta - Mol Cell Res,* 1865(2): 421-431. DOI: 10.1016/j.bbamcr.2017.11.009 (IF 4.739)

18. Igreja S, Clarke LA, Botelho HM, Marques L, Amaral MD (2015) **Correction of a cystic fibrosis splicing mutation by antisense oligonucleotides**. *Human mutat,* 37(2): 209-215. DOI: 10.1002/humu.22931 (IF 5.089)

19. Clarke LA, Botelho HM, Sousa L, Falcão AO, Amaral MD (2015) **Transcriptome meta-analysis reveals common differential and global gene expression profiles in cystic fibrosis and other respiratory disorders and identifies CFTR regulators**. *Genomics,* 106(5): 268-277. DOI: 10.1016/j.ygeno.2015.07.005 (IF 2.386)

20. Botelho HM, Uliyakina I, Awatade NT, Proença MC, Tischer C, Sirianant L, Kunzelmann K, Pepperkok R, Amaral MD (2015) **Protein traffic disorders: an effective high-throughput fluorescence microscopy pipeline for drug discovery**. *Sci Rep,* 5, 9038. DOI: 10.1038/srep09038 (IF 5.228)

21. Carvalho SB, Botelho HM, Leal SS, Cardoso I, Fritz G, Gomes CM (2013) **Intrinsically disordered and aggregation prone regions underlie β-aggregation in S100 proteins**. *PLoS ONE*, 8, e76629. DOI: 10.1371/journal.pone.0076629 (IF 3.354)

22. Sá-Moura B, Simões AM, Fernandes H, Fraga J, Abreu IA, Botelho HM, Gomes CM, Marques AJ, Dohmen J, Ramos P, Macedo-Ribeiro S (2013) **Biochemical and biophysical characterization of recombinant yeast proteasome maturation factor ump1**. *Comput Struct Biotechnol J*, 7(8), e201304006. DOI: 10.5936/csbj.201304006 (IF 4.148, 2017)

23. Botelho HM, Leal SS, Cardoso I, Yanamandra K, Morozova-Roche LA, Fritz G, Gomes CM (2012) **S100A6 amyloid fibril formation is calcium-modulated and enhances superoxide dismutase-1 (SOD1) aggregation**. *J Biol Chem*, 287(50): 42233-42. DOI: 10.1074/jbc.M112.396416 (IF 4.651)

24. Leal SS*, Botelho HM *, Gomes CM (2012) **Metal ions as modulators of protein conformation and misfolding in neurodegeneration**. *Coord Chem Rev*, 256: 2253-2270. (*equally contributing authors). DOI: 10.1016/j.ccr.2012.04.004 (IF 11.016)

25. Veith A, Botelho HM, Kindinger F, Gomes CM, Kletzin A (2012) **The sulfur oxygenase reductase from the mesophilic bacterium *Halothiobacillus neapolitanus* is a highly active thermozyme**. *J Bacteriol*, 194: 677-685. DOI: 10.1128/JB.06531-11 (IF 3.177)

26. Botelho HM, Gomes CM (2011) **Structural reorganization renders enhanced metalloprotein stability**. *Chem Commun*, 47: 11149-11151. DOI: 10.1039/c1cc13354c (IF 6.169)

27. Fritz G, Botelho HM, Morozova-Roche LA, Gomes CM (2010) **Natural and amyloid self-assembly of S100 proteins: structural basis of functional diversity**. *FEBS J*, 277: 4578-90. DOI: 10.1111/j.1742-4658.2010.07887.x (IF 3.129)

28. Botelho HM, Leal SS, Veith A, Prosinecki V, Bauer, C., Fröhlich, R., Kletzin A, Gomes CM (2010) **Role of a novel disulfide bridge within the all-beta fold of soluble Rieske proteins**. *J Biol Inorg Chem*, 15: 271-281. DOI: 10.1007/s00775-009-0596-3 (IF 3.287)

29. Botelho HM, Koch M, Fritz G, Gomes CM (2009) **Metal ions modulate the folding and stability of the tumor suppressor protein S100A2**. *FEBS J*, 276(6): 1776-86. DOI: 10.1111/j.1742-4658.2009.06912.x (IF 3.042)

30. Prosinecki V, Botelho HM, Francese S, Mastrobuoni G, Moneti G, Urich T, Kletzin A, Gomes CM (2006) **A proteomic approach toward the selection of proteins with enhanced intrinsic conformational stability**. *J Proteome Res*, 5(10): 2720-6. DOI: 10.1021/pr0602491 (IF 5.151)

Book Chapters

1. Amaral MD, Clarke LA, Farinha CM, Botelho HM (2023) **Systems Biology and the New Omics**, *in* Hodson and Geddes' Cystic Fibrosis, 5th Edition (Bush A, Amaral MD, Davies JC, Simmonds NJ, Taylor-Cousar JL and Ranganathan S, Eds.) Taylor & Francis. CRC Press. Boca Raton FL, USA. DOI: 10.1201/9781003262763

2. Amaral MD, Farinha CM, Matos P, Botelho HM (2016) **Investigating alternative transport of integral plasma membrane proteins from the ER to the Golgi: lessons from the cystic fibrosis transmembrane conductance regulator (CFTR)**, *In* Unconventional Protein Secretion: Methods in Molecular Biology, vol. 1459 (Pompa, A., and De Marchis, F., Eds.) 105-126. Humana Press, New York. DOI: 10.1007/978-1-4939-3804-9_7

3. Carvalho SB, Cardoso I, Botelho HM, Yanamandra K, Fritz G, Gomes CM, Morozova-Roche LA (2014) **Structural heterogeneity and bioimaging of S100 amyloid assemblies**, *in* Bionanoimaging: Protein Misfolding and Aggregation (Uversky, V., Lyubchenko, Y., eds), 197-212. Academic Press, Boston. DOI: 10.1016/B978-0-12-394431-3.00018-3

4. Botelho HM, Fritz G, Gomes CM (2012) **Analysis of S100 oligomers and amyloids**, *in* Amyloid Proteins: Methods and Protocols, Methods in Molecular Biology, vol. 849 (Sigurdsson E.M., Calero, M., Gasset, M., eds), 373-386. Springer Science+Business Media. DOI: 10.1007/978-1-61779-551-0_25

Patents

1. Amaral MD, Botelho HM, Lopes-Pacheco M (2023) **Method of identifying agents for the treatment of cystic fibrosis caused by the mutation F508del**. International Patent PCT/IB2023/051813. WIPO.

SOFTWARE PORTFOLIO

http://github.com/hmbotelho
Selected examples:

Organoid Analyst
https://github.com/hmbotelho/organoid_analyst
Web app for the statistical analysis of the Forskolin-Induced Swelling (FIS) assay in Cystic Fibrosis research.

shinyHTM
https://github.com/embl-cba/shinyHTM
An interactive web-based tool which uses the R shiny package to inspect, plot and visualize high throughput microscopy data and images.

htmrenamer (R package)
https://github.com/hmbotelho/htmrenamer
Systematic renaming of high throughput microscopy images.

FIS analysis tools
https://github.com/hmbotelho/fis_image_analysis
Measurement of organoid features in a live cell microscopy assay with CellProfiler or Fiji/ImageJ.

LECTURING ACTIVITY, SELECTED EXAMPLES

2022-2025	**Fundamentos de Química e Bioquímica *[Fundamentals of Chemistry and Biochemistry]***. Theoretical and Problem solving lectures. BSc in Biomedical and Biophysical Engineering and BSc in Physical Engineering, FCUL. 1st year,2nd semester.
2025	**Bioquímica Experimental II *[Experimental Biochemistry II]***. Laboratory lectures. BSc in Biochemistry, FCUL. 2rd year,2nd semester.
2024	**Bioquímica Experimental IV *[Experimental Biochemistry IV]***. Laboratory lectures. Degree in Biochemistry, FCUL. 3rd year,2nd semester.
2017-2024	**Functional screens and high throughput microscopy in drug discovery**. Lecture for FCUL MSc in Biochemistry and Biomedicine, Omics approaches in biomedicine and biotechnology module.
2023	**Introdução à Biologia Molecular *[Introduction to Molecular Biology]***. Problem solving lectures. Degree in Biochemistry, FCUL. 1st year,2nd semester.
2016-2022	**Data analysis in high content microscopy**. Course on High Throughput Screening and Image Analysis for Biosciences. i3S. Porto, Portugal. Organizer: André Maia.
2016-2021	**Fluorescence Microscopy**. Lecture for FCUL Biochemistry Master's course. Complements in Biochemical Analysis module.
2020	**Biochemistry.** Laboratory lectures. Biology degree FCUL, 1st year,1st semester.
2016-2017	**High-throughput microscopy & screening**. Lecture for FCUL Animal Biology Department Master's course. Bioimaging module.

COORDINATION OF RESEARCH PROJECTS

2024	**Biocompatible Coatings with Natural-Based Nano-Agents for Biomedical Applications** BioISI Project. 5,000€ Principal Investigators: Noelia Losada García & Hugo M. Botelho
2023-2024	**NewKinCF – Unraveling the mechanism of action of a novel kinase regulator of F508del-CFTR traffic and activity** FCT 2022.03453.PTDC. 50,000€ Principal Investigator: Hugo M. Botelho

2022 **Mitochondrial network in Multiple Acyl-CoA Dehydrogenase Deficiency: construction of a high-content bioimage analysis workflow**
BioISI Project. 5,000€
Principal Investigators: Hugo M. Botelho & Filipa S. Carvalho.

2020 **VALHealth – Valorisation of Algae for Health: Bioactive Compounds from Marine Bioresources by Membrane Technology**
BioISI Project. 10,000€
Principal Investigators: Rita Pacheco & Hugo M. Botelho.

2018 **Deconvolution of dual CFTR/ANO1 Modulators from Portuguese natural products – A new class of drugs for CF therapy**
BioISI Project. 10,000€
Principal Investigators: Helena Gaspar, Helena Vieira & Hugo M. Botelho.

2017 **A new class of drugs for CF therapy - Dual CFTR/ANO1 Modulators from Portuguese natural products**
BioISI Project. 10,000€
Principal Investigators: Hugo M. Botelho & Helena Vieira.

2016 **Natural compounds as a source of novel drug leads for Cystic Fibrosis**
BioISI Project. 10,000€
Principal Investigators: Hugo M. Botelho & Helena Vieira.

2016 **The identification of new natural compounds of high therapeutic potential for Cystic Fibrosis by high-throughput microscopy screens**
BioISI Post-Doc.
Supervisors: Hugo M. Botelho & Helena Vieira.

ORGANIZATION OF SCIENTIFIC MEETINGS

2026 **ELMI - European Light Microscopy Initiative**
Member of the scientific committee
June. Convento de São Francisco, Coimbra.
https://www.elmi2026.org

2024 **4th Chem&BioChem – Students Meeting, FCUL**
Member of the scientific committee
27 June, Faculty of Sciences, University of Lisbon
https://chembiochem.campus.ciencias.ulisboa.pt

2023 **SPAOM2023 – Spanish-Portuguese Advanced Optical Microscopy 2023**
Member of the scientific committee
25-27 October, University of Algarve, Portugal
https://www.spaom2023.pt

2022 **2nd Chem&BioChem – Postgraduate Students Meeting, FCUL**
Member of the scientific committee
15 July, Faculty of Sciences, University of Lisbon
https://chembiochem.campus.ciencias.ulisboa.pt

2021 **SPAOM2021 – Spanish-Portuguese Advanced Optical Microscopy 2021**
Member of the scientific committee & HCS Community Workshop Organizer
23-25 November, Online
https://igc.idloom.events/spaom2021

2021 **Eutopia 3 – Third Meeting of the European Topology Interdisciplinary Initiative**
Member of the local organizing committee
15-17 February, Faculty of Sciences, University of Lisbon
http://eutopia3.campus.ciencias.ulisboa.pt

2019 **Workshop on Integrative Approaches to Protein Folding & Aggregation**
Organizing Committee
11-12 June, Faculty of Sciences, University of Lisbon
http://folding2019.campus.ciencias.ulisboa.pt

ORGANIZATION OF TRAINING EVENTS, SELECTED EXAMPLES

2022-2025 **Macro Scripting in ImageJ**
Lisbon, Portugal

2021-2024 **Introduction to Image Analysis**
Lisbon, Portugal

2024 **Basics on Advanced Microscopy Workshop for Facility Staff**
GIMM. Oeiras, Portugal.

2024 **Advanced Course on the Principles of Light Microscopy**
Champalimaud Foundation. Lisbon, Portugal.

2021-2022 **Basics in Light Microscopy**
13-16 December. Lisbon, Portugal.
Participants: 15
https://fculmf.campus.ciencias.ulisboa.pt/blm2022

2015-2018 **Hands-on Workshop on High-Throughput Microscopy**
BioISI/FCUL. Lisbon, Portugal.

SCIENTIFIC SOCIETIES

2016-present NEUBIAS: Network of European BioImage Analysts, COST Action CA15124

2006 - present Portuguese Biochemical Society & Portuguese Biophysical Society