Short Biography

Patrícia A. T. Martins was born in 1983 in Lisbon, Portugal. She graduated in Biochemistry at the University of Lisbon in 2005 with a grade of 15 out of 20. During the last year of her graduation she joined the group of Professor Ricardo Boavida Ferreira, at the Institute of Chemistry and Biological Technology of the New University of Lisbon, working in the extraction and characterization of a newly discovered storage protein present in raspberry (*Rubus idaeus L.*) roots. The work developed was presented in a scientific meeting in Pucón, Chile and resulted in a protein sequence registration and the internship was completed with a grade of 19 out of 20.

After her graduation Patrícia received a fellowship from the Biological Chemistry Group at the University of Coimbra to work in the project "Quantitative modelling of passive transcytotic diffusion of amphiphilic molecules across the Blood-Brain Barrier". Her work in this project was published in two papers, in peer reviewed journals. During this period Patrícia also collaborated in the main research projects of the group namely the interaction of small drugs with proteins, lipoproteins and lipid vesicles, presented some posters and an oral communication at national and international scientific meetings and attended biophysical courses. She then continued at the University of Coimbra to develop her doctoral studies and in 2013 Patrícia finished her PhD in Chemistry, under the supervision of Professor Maria João Moreno. In this work the evaluation of chlorpromazine interaction with lipid bilayers was assessed using Isothermal Titration Calorimetry in order to obtain the corresponding partition coefficients and thermodynamic parameters. A new methodology was developed that allowed the use of ITC to quantitatively characterize the kinetics of translocation across lipid bilayers in the liquid disordered state. This work was published in Journal of American Chemical Society, in a book chapter and was awarded the Young Biophysicist Award by the Portuguese Biophysical Society in 2014.

Presently, Patrícia is a Pos-doc at Professor Niveen Khashab group in the King Abdullah University of Science and Technology, Thuwal (Kingdom of Saudi Arabia). Her main project is related with the early events in Alzheimer's disease, using reconstituted lipoproteins based nanoparticles as drug delivery agents targeting amyloid beta peptide aggregation.

Curriculum Vitae

Patrícia Alexandra Teles Martins

Personal Information

e-mail	patricia.martins@kaust.edu.sa
Telephone	+351 963 602 637 +966 546 764 059
Current adress	King Abdullah University of Science and Technology (KAUST) Thuwal 23955-6900 PO Box # 2262 Smart Hybrid Materials Lab Ibn Al Haytham Building, level 4, Area 4, Room 4254-WS15 Kingdom of Saudi Arabia
Birth	March 8th, 1983 Lisbon, Portugal
Orcid ID	http://orcid.org/0000-0002-2264-4451

Academic Education

2008 - 2013 PhD in Chemistry – Biological Chemistry (**pre-Bologna**)
University of Coimbra
Level: Approved unanimously, with Distinction and Honours
Thesis: "Passive permeation across the blood-brain barrier - Kinetics and thermodynamics of Chlorpromazine interaction with lipid bilayers representative of endothelial cell membranes"
https://estudogeral.sib.uc.pt/handle/10316/23513?mode=full
Supervisor: Maria João Pedrosa Moreno Silvestre (mmoreno@ci.uc.pt)
Co-supervisor: Winchil Luís Cláudio Vaz (wvaz@ci.uc.pt)

2000 - 2005 BSc in Biochemistry (**5 years curriculum, pre-Bologna**)
University of Lisbon
Level: 15/20

Activity

2015 – present Post Doctoral Fellow
King Abdullah University of Science and Technology (KAUST), Kingdom of Saudi Arabia
Smart Hybrid Materials (SHMs)
Supervisor: Niveen M. Khashab (niveen.khashab@kaust.edu.sa)

2014 Post Doctoral Fellow
University of Minho, Braga, Portugal
3 B's Research Group - Biomaterials, Biodegradables and Biomimetics
Supervisors: Isabel Leonor and Rogério Pirraco

2013	Research Assistant University of Aveiro, Portugal Organic Chemistry, Natural Products and Agricultural Food Group Supervisor: João Paulo Tomé
2009: Sep – Dec (and other smaller periods between 2008-2013)	PhD student – visitor University of Zaragoza, Spain Institute for Biocomputation and Physics of Complex Systems (BIFI) Supervisor: Adrián Velazquez-Campoy (adrianvc@unizar.es)
2008 – 2013	PhD student University of Coimbra, Science and Technology Faculty Biological Chemistry Research Group Supervisors: Maria João Moreno and Winchil Vaz
2007 – 2008	Research Assistant University of Coimbra, Science an Technology Faculty Biological Chemistry Research Group Supervisor: Maria João Moreno
2006	Research Assistant Molecular and Cellular Biology Institute, University of Porto Neural Networks Group Supervisor: Boris Safronov
2004 – 2005	Undergraduated Student Chemical and Biological Technology Institute (ITQB) Plant Sciences, Disease and Stress Biology Supervisor: Ricardo Boavida Ferreira

Scientific Interests and Skills

My research interests include the Blood-Brain barrier permeation, drug delivery systems and their interaction with biomembranes, the kinetics and thermodynamics of the interaction of drugs and drug carriers with lipidic membranes, serum proteins and lipoproteins and the understanding of the mechanisms underlying loading and release of functional molecules into and from their carriers.

I have developed very good to excellent skills in the use of Isothermal Titration Calorimetry (VP-ITC, MicroCal) to obtain partition coefficients and thermodynamic parameters for the interaction of small molecules with proteins and lipid vesicles. I've developed new methodologies for the use of this unique and very powerful technique to study the kinetic parameters for the interactions.

I have also developed skills in the use of the following techniques: Differential Scanning Calorimetry (DSC), spectroscopic methods such as steady-state and Stopped-Flow fluorescence, Dynamic Light Scattering, UV-Visible and Circular Dichroism spectroscopies.

From previous activities, I am also skilled in the optimization of protein extraction, purification and characterization, usage of FPLC system (anionic exchange, affinity, gel filtration…), HPLC and CG chromatography, electrophoresis, blotting assays and enzyme kinetics.

Additionally, I am also a trained user of cell culture room, worked with stem cells cultures and handled live animals for the preparation of spinal cord tissue for patch clamp assays.

Publications and Communications

Papers in international scientific periodicals with referees: (5)

2016 Ângela Inácio, Neuza Domingues, Alexandra Nunes, Patricia Martins, Maria Moreno, Luis Estronca, Rui Fernandes, Antonio Moreno, Maria Jose Borrego, Joao Gomes, Winchil Vaz and Otilia Vieira
Quaternary ammonium surfactant structure determines selective toxicity towards bacteria: mechanisms of action and clinical implications in anti-bacterial prophylaxis
Journal of Antimicrobial Chemotherapy 71, 641-654
DOI:10.1093/jac/dkv405 **i.f.: 5.313 cit.: -**

2015 Filipe M. Coreta-Gomes, Patricia A. T. Martins, Adrian Velazquez-Campoy, Winchil L. C. Vaz, Carlos F. G. Geraldes and Maria João Moreno
Interaction of bile salts with model membranes mimicking the gastrointestinal epithelium: A study by isothermal calorimetry
Langmuir 31, 9097-9104
DOI: 10.1021/acs.langmuir.5b01810 **i.f.: 4.457 cit.: 2**

2012 Patricia T. Martins, Adrian Velazquez-Campoy, Winchil L. C. Vaz, Renato M. S. Cardoso, Joana Valério and Maria João Moreno
Kinetics and thermodynamics of Chlorpromazine interaction with lipid bilayers: Effect of charge and cholesterol
Journal of the American Chemical Society 134, 4184-4195
DOI: 10.1021/ja209917q **i.f.: 12.113 cit.: 8**

2011 Renato M. S. Cardoso, Patricia A. T. Martins, Filipe Gomes, Slavomira Doktorovova, Winchil L. C. Vaz and Maria João Moreno
Chain-length dependence of insertion, desorption and translocation of a homologous series of 7-nitrobenz-2-oxa-1,3-diazol-4-yl-labeled aliphatic amines in membranes
Journal of Physical Chemistry B 115, 10098–10108
DOI: 10.1021/jp203429s **i.f.: 3.302 cit.: 10**

2008 Patricia A. T. Martins, Filipe Gomes, Winchil L. C. Vaz and Maria J. Moreno
Binding of phospholipids to β-Lactoglobulin and their transfer to lipid bilayers
Biochimica et Biophysica Acta – Biomembranes 1778(5) 1308-1315
DOI: 10.1016/j.bbamem.2008.02.011 **i.f.: 3.836 cit: 14**

Book chapters (1)

2016 Patrícia A. T. Martins, Adrian Velazquez-Campoy and Maria João Moreno "Kinetics of the Interaction of Amphiphiles with Lipid Bilayers using ITC", in "Biocalorimetry: Foundations and Contemporary Approaches", Ed. Margarida Bastos, Taylor & Francis Catalog #: K23600, **ISBN: 978-1-4822-4665-0**

Papers in conference proceedings: (5)

2015 Patrícia T. Martins, Adrian Velazquez-Campoy, Winchil L. C. Vaz, Renato M. S. Cardoso, Joana Valério and Maria João Moreno
Kinetics and thermodynamics of Chlorpromazine interaction with lipid bilayers: Effect of charge and cholesterol
European Biophysics Journal 44 (Suppl 1) pp. S187 **i.f.: 2.219**

2013 Maria João Moreno, Patricia T. Martins and Adrian Velazquez-Campoy
Applications of Isothermal Titration Calorimetry in the characterization of the energetics and kinetics of the interaction of amphiphiles with lipid bilayers
Biophysical Journal 104(2) pp 86a **i.f.: 3.97**

2011 Patricia A. T. Martins, Adrián Velazquez-Campoy, Winchil L. C. Vaz and Maria J. Moreno
Thermodynamics of Chlorpromazine association with lipid bilayers
Biophysical Journal 100(3) pp. 505ª **i.f.: 3.97**

2009 Renato Cardoso, Filipe M.C. Gomes, Patricia T. Martins, Winchil L.C. Vaz, and Maria J. Moreno
Effect of the acyl chain length on the translocation rate of amphiphilic molecules in liquid disordered and liquid ordered lipid bilayers
Biophysical Journal 96(3) pp. 351a **i.f.: 3.97**

2007 P. A. Martins, W. L. C. Vaz and M. J. Moreno
Binding of phospholipids to β-Lactoglobulin
Colloids and Interfaces – Book of Proceedings – RICI2

Oral Communications in Scientific Meetings: (3)

2016 Ana Maria Alves, Renato Cardoso, Tiago Palmeira, Patrícia T. Martins and Maria João Moreno
Molecular Crowding Effects on the Solubility of Amphiphilic Molecules and their Partition to Biological Membranes
International Conference on Physics and Chemistries of Hydrophobic Interfaces, KAUST, Thuwal (Jeddah), Saudi Arabia

2015 Patrícia T. Martins, Adrian Velazquez-Campoy, Winchil L. C. Vaz, Renato M. S. Cardoso, Joana Valério and Maria João Moreno
Kinetics and thermodynamics of Chlorpromazine interaction with lipid bilayers: Effect of charge and cholesterol
10th European Biophysics Congress, Dresden, Germany

2008 Martins P. A. T., Gomes F., Vaz W. L. C. and Moreno M. J.
Binding of phospholipids to β-lactoglobulin and their transfer to lipid bilayers
1st Portuguese-Spanish-British Joint Biophysics Congress, Lisboa, Portugal

Posters in Scientific Meetings: (10)

2015 Kholod O. Alamoudi, Patricia A. Martins, Lin Deng and Niveen M. Khashab
Bubble-liposomal nanocarriers as an advanced gene delivery model
4th Nano Today Conference, Dubai, United Arab Emirates

2015 Patrícia T. Martins, Adrian Velazquez-Campoy, Winchil L. C. Vaz, Renato M. S. Cardoso, Joana Valério and Maria João Moreno
Kinetics and thermodynamics of Chlorpromazine interaction with lipid bilayers: Effect of charge and cholesterol
10th European Biophysics Congress, Dresden, Germany

2014 Sofia Ribeiro; Simone S. Silva; Patrícia A. T. Martins; Rogério P. Pirraço; Isabel B. Leonor and Rui L. Reis
Biomimetic silk fibroin membrane for periosteum regeneration
TermStem 2014, Porto, Portugal

2013 Maria J. Moreno, Patricia T. Martins and Adrian Velazquez-Campoy
Aplications of Isothermal Titration Calorimetry on the characterization of the energetics and kinetics of the interaction of amphiphiles with lipid bilayers
Biophysical Society 57th Meeting, Philadelphia, EUA

2011 Patricia A. T. Martins, Adrian Velazquez-Campoy, Winchil L. C. Vaz and Maria J. Moreno
Thermodynamics of Chlorpromazine association with lipid bilayers
Biophysical Society 55th Annual Meeting, Baltimore, EUA

2010 Patricia A. T. Martins, Adrian Velazquez-Campoy, Winchil L. C. Vaz and Maria J. Moreno
Thermodynamics of Chlorpromazine association with lipid bilayers
IV Spanish Portuguese Biophysical Congress, Zaragoza, Spain

2009 Patricia A. T.Martins, Renato M. Cardoso, Filipe Gomes, Winchil L. C. Vaz and Maria J. Moreno
Effect of the acyl chain length on the translocation rate of amphiphilic molecules in liquid disordered and liquid ordered lipid bilayers
Biophysical Society 53rd Annual Meeting, Boston, EUA

2008 Patricia A. T. Martins, Filipe Gomes, Winchil L. C. Vaz and Maria J. Moreno
Binding of phospholipids to β-lactoglobulin and their transfer to lipid bilayers
1st Portuguese-Spanish-British Joint Biophysics Congress, Lisboa, Portugal

2007 Patricia A. Martins, Winchil L. C. Vaz and Maria J. Moreno
Binding of phospholipids to β-lactoglobulin
2ª Reunião Ibérica de Colóides e Interfaces, Coimbra, Portugal

2005 Patrícia A. Martins, Pedro B. Oliveira, Ricardo B. Ferreira
Characterization of a storage protein from primocane-fruiting red raspberry 'Autumn Bliss' roots
9th International Rubus and Ribes Symposium, Pucón, Chile

Protein sequence:

2007 Borrego, V., Martins, P., Santos, C., Oliveira, P., Teixeira, A. R., Ferreira, R. B.
Rubusin, the storage protein present in raspberry (*Rubus idaeus L.*) roots. (17 aminoacid residues)
UniProtKB/Swiss-Prot entry P85096

Thesis:

2013 Passive permeation across the blood-brain barrier. Kinetics and thermodynamics of Chlorpromazine interaction with lipid bilayers representative of endothelial cell membranes
https://estudogeral.sib.uc.pt/handle/10316/23513?mode=full

2005 Caracterização preliminar de uma proteína de reserva em raízes de framboesa remontante 'Autumn Bliss' em cultura protegida; Doseamento da proteína radicular expressa em maior quantidade em framboesa remontante 'Joan Irene' em cultura hidropónica protegida

Courses

2015, Oct-Dec Scientific Writing Course (21 hours)
King Abdullah University of Science and Technology (KAUST)
Thuwal, Saudi Arabia

2014, Jun Cell Culture Lab Training (25 hours)
3 B's research group - Biomaterials, Biodegradables and Biomimetics
Braga, Portugal

2010, Jun EBSA Biophysics Course on:
Membrane Biophysics and Lipid/Protein Interaction
European Biophysical Societies' Association (EBSA)
Bordeaux/Arcachon, France

2009, Oct	8th Short Course of SPBf on: Systems Biology Portuguese Biophysical Society (SPBf) Santarém, Portugal
2007, Oct	7th Short Course of SPBf on: BioSpectroscopy and Imaging Portuguese Biophysical Society (SPBf) Santarém, Portugal

Prizes and Awards

2014	**Young Biophysicist 2014** Portuguese Biophysical Society (SPBf)
2011	International Travel Award Biophysical Society
2010	Travel Award Portuguese Biophysical Society (SPBf)
2010	**Best Poster Award** Spanish Biophysical Society (SBE)
2009	International Travel Award Biophysical Society
2008-2012	**PhD Fellowship** (SFRH/BD/38951/2007) Portuguese Foundation for Science and Technology (FCT) – Ministery for Education and Science of Portuguese Government

Languages

Portuguese	Mother tongue	
English	Reading:	Proficient
	Writing:	Proficient
	Speaking:	Proficient
Spanish	Reading:	Autonomous
	Writing:	Basic
	Speaking:	Autonomous

Participation in scientific projects (team member)

Pest-C/QUI/UI0062/2013	Strategic Project – UI 62, 2013-2014 Ended in 2014-12-31
Pest-C/QUI/UI0313/2011	Strategic Project – UI 313, 2011-2012 Ended in 2012-12-31
PTDC/QUI/64565/2006	Molecular crowding effects on the kinetics and thermodynamics of the interaction of amphiphilic molecules with proteins and with biological membranes Ended in 2010-12-31 Researcher 30%
PTDC/SAU-FCF/69072/2006	Quantitative modelling of passive transcytotic diffusion of amphiphilic molecules across the Blood-Brain Barrier Ended in 2010-06-30 Researcher 50 %