

Curriculum Vitae – Elisabete Maciel

1. PERSONAL DATA



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Elisabete Maciel
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University of Aveiro Campus
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2. ACADEMIC DEGREES

Year

2014 - PhD in Biochemistry, University of Aveiro

2010 - Master's Degree in Biomolecular Methods, University of Aveiro

2008 - Degree in Biochemistry, University of Aveiro

3. Previous activity and current status

- February 2015 – Present – Post-Doctoral research

- Lipidomic studies on autochthonous halophyte plants by mass spectrometry (MS)-based methods
- Searching for bioactive compounds
- Contribution in the supervision of the research work of several master students at university of Aveiro

- July 2010-March 2011 – Research Fellow at University of Aveiro

- In vitro phospholipids oxidation: Fenton reaction and UV radiation
- Characterization of oxidation products of glycosylated phospholipids by LC-MS

4. Domain of specialization

- Biomolecular methods, with emphasis on mass spectrometry and separation techniques: GC-MS; LC-MS/MS and TLC.
- Lipidomics: identification and structural characterization of the lipid mass spectrometry
- Applications and development of analytical methods for the characterization of lipids and lipid oxidation

5. Current research interests

- Plant lipidomics
- Marine lipidomics
- Lipids as a biologically active compounds
- Oxidative stress

6. Other professional interests/activities

- The use in regular basis of modern methods of separation, detection and analysis (quality control and statistics, bioinformatics, modeling of chemical structures).
- Four months of Internship in the laboratory of Dr. Valerian Kagan, an expert in lipidomics and lipid oxidation at the University of Pittsburgh, Pennsylvania, USA, January to April 2014
- Internship of one month in the laboratory of Dra. Corinne Spickett, mass spectrometry and free radicals expert in Aston University, Birmingham UK, October 2012

7. Experience as a scientific advisor

- Supervised BSc students:

1. 2016 Ana Carolina Marques; “Valorização da *Halimione portulacoides* recolhida no seu habitat natural e num sistema de aquaponia: um estudo lipidómico”; 18 Valores
2. 2016 Ana Glória Ferreira; “Caracterização do perfil lipídico da *Salicornia ramosissima* da Ria de Aveiro e de um sistema de aquaponia”; 17 Valores

- co-supervised BSc students:

2013 Alicia Rodrigues Antunes "Biomimetic (per) oxidation of cardiolipin and/or other phospholipids: a MS approach".

2013 Vitor Azevedo "Per (oxidation biomimética da cardiolipina: uma abordagem por espectrometria de massa"

8. Participation in R&D projects (ordinator/member of the team)

1. Coordinator of the international project HALOFOOD - “Decoding lipid profile of saltmarsh halophytes for human consumption and livestock nutrition” CNRS/INEE - National Centre for Scientific Research/Institute of Ecology and Environment, via OHMI – International Observatory Hommes-Millieux. 2016. (2016-05-01 - 2017-07-31 (15 Months))
2. Member of the team project “Advanced Analytical Chemistry for Life Sciences” (ACCLifeSci) (ERASMUS+), Universidade de Białystok, Polónia. (2015-2017)
3. Member of the research team of the funded project: the role of aminophospholipid glycosylation in oxidative stress and their immune response: a lipidomic approach (PTDC/QUI-BIQ/104968/2008).

9. Prizes and awards received

1. 2016 – Best communication - Elisabete Maciel, Ricardo Calado, Ana Lillebø, Daniel Ettlin, Pedro Domingues and Rosário Domingues. Valorization of autochthonous halophyte plants through hydrophilic interaction chromatography coupled to Q Exactive mass spectrometer received the award for the best Communication in LC-MS at the international conference XVI COLACRO- Latin-American Congress on Chromatography

10. Publications

THESIS

“Oxidation and glycooxidation of phosphatidylserine and their effect in immune response: a lipidomic approach” tese de Doutorado, Universidade de Aveiro, 2014.

"Identification of oxidation products of cardiolipin using mass spectrometry", Tese de Mestrado, Universidade de Aveiro, 2010.

ARTICLES IN INTERNATIONAL JOURNALS WITH REFEREES

1. **Maciel, E.**; Leal, M. C.; Lillebø, A. I.; Domingues, P.; Domingues, M. R.; Calado, R., Bioprospecting of marine macrophytes using MS-based lipidomics as a new approach. *Marine Drugs* 2016, 14, (3).
2. Campos A.M., **Maciel E.**, Moreira A.S.P., Sousa B., Melo T., Domingues P., Curado L., Antunes B., Domingues M.R.M., Santos F. Lipidomics of Mesenchymal Stromal Cells: Understanding the Adaptation of Phospholipid Profile in Response to Pro-Inflammatory Cytokines. *Journal of Cellular Physiology*. (2016) 231, 5, 1024-1032
3. Couto, D.; Melo, T.; **Maciel, E.**; Campos A.; Alves E.; Guedes S.; Domingues, MR.; Domingues P.; New Insights on Non-Enzymatic Oxidation of Ganglioside GM1 Using Mass Spectrometry. *J. Am. Soc. Mass Spectrom.* (2016) 27: 1965. doi:10.1007/s13361-016-1474-1
4. Martins, J.; **Maciel, E.**; Silva, A.; Domingues, P.; Neves, BM.; Cruz, MT.; Domingues, MR. Phospholipidomic Profile Variation on THP-1 Cells Exposed to Skin or Respiratory Sensitizers and Respiratory Irritant. *J. Cell. Physiol.* (2016) 231 12 1097-4652. Doi: 10.1002/jcp.25365
5. A. M. Campos, E. **Maciel**, A. S P Moreira, B. Sousa, T. Melo, P. Domingues, L. Curado, B. Antunes, M. R. M Domingues, F. Santos, Lipidomics of Mesenchymal Stromal Cells: Understanding the Adaptation of Phospholipid Profile in Response to Pro-Inflammatory Cytokines, *Journal of Cellular Physiology* 09/2015;
6. Y Y Tyurina · A M Polimova · **E Maciel** · V A Tyurin · V I Kapralova · D E Winnica · A S Vikulina · M R M Domingues · J McCoy · L H Sanders · H Bayır · J T Greenamyre · V E Kagan, LC/MS analysis of cardiolipins in substantia nigra and plasma of rotenone-treated rats: Implication for mitochondrial dysfunction in Parkinson's disease, *Free Radical Research* 03/2015; 49(5):1-11.
7. D. Santinha, E. Ferreira-Fernandes, T. Melo, E. M. P. Silva, **E. Maciel**, M. Fardilha, P. Domingues, M. R. M. Domingues, Evaluation of the photooxidation of galactosyl- and lactosylceramide by electrospray ionization mass spectrometry, *Rapid Communications in Mass Spectrometry* 11/2014; 28(21).
8. L.M.O. Lourenço, P.M.R. Pereira, **E. Maciel**, M. Válega, F.M.J. Domingues, M.R.M. Domingues, M.G.P.M.S. Neves, J.A.S. Cavaleiro, R. Fernandes, J.P.C. Tomé, Amphiphilic phthalocyanine-cyclodextrin conjugates for cancer photodynamic therapy, *Chemical Communications*, 50 (2014) 8363-8366.
9. I.O. Gonçalves, **E. Maciel**, E. Passos, J.R. Torrella, D. Rizo, G. Viscor, S. Rocha-Rodrigues, E. Santos-Alves, M.R. Domingues, P.J. Oliveira, A. Ascensão, J. Magalhães, Exercise alters liver mitochondria phospholipidomic profile and mitochondrial activity in non-alcoholic steatohepatitis, *International Journal of Biochemistry and Cell Biology*, 54 (2014) 163-173.
10. R. Faria, M.M. Santana, C.A. Azeiteira, C. Simões, **E. Maciel**, T. Melo, D. Santinha, M.M. Oliveira, F. Peixoto, P. Domingues, C. Cavadas, M.R.M. Domingues. Alterations in

phospholipidomic profile in the brain of mouse model of depression induced by chronic unpredictable stress, *Neuroscience*, 273 (2014) 1-11.

11.J. Pinto, **E. Maciel**, T. S Melo, M. R.M. Domingues, E. Galhano, C. Pita, M. C. Almeida, I. M. Carreira, A. M. Gil, Maternal plasma phospholipids are altered in trisomy 21 cases and prior to preeclampsia and preterm outcomes, *Rapid Communications in Mass Spectrometry* 28 (2014):1635-1638.

12.D. Antunes, A. I. Padrão, **E. Maciel**, D. Santinha, P. Oliveira, R. Vitorino, D. Moreira-Gonçalves, B. Colaço, M. J. Pires, C. Nunes, L. L. Santos, F. Amado, J. A. Duarte, M. R. Domingues, R. Ferreira, Molecular insights into mitochondrial dysfunction in cancer-related muscle wasting, *Biochimica et Biophysica Acta-Molecular and Cell Biology of Lipids*, 1841 (2014) 896-905.

13.**E. Maciel**, B.M. Neves, D. Santinha, A. Reis, P. Domingues, M. T. Cruz, A. R Pitt, C. M Spickett, M. R. M Domingues, Detection of phosphatidylserine with a modified polar head group in human keratinocytes exposed to the radical generator AAPH. *Archives of biochemistry and biophysics*, 548 (2014) 38-45.

14.Y. Y. Tyurina, R. M. Domingues, V. A Tyurin, **E. Maciel**, P. Domingues, A. A Amoscato, H. Bayir, V. E Kagan, Characterization of cardiolipins and their oxidation products by LC–MS analysis. *Chemistry and physics of lipids*, 179, (2014) 3-10.

15.E.Alves, N. Santos, T.Melo, **E. Maciel**, M. L. Dória, M. AF Faustino, J.PC Tomé, M. GPMS Neves, J.A.S Cavaleiro, Â. Cunha, L. A. Helguero, P. Domingues, A. Almeida, M. R. M Domingues. Photodynamic oxidation of *Escherichia coli* membrane phospholipids: new insights based on lipidomics. *Rapid Communications in Mass Spectrometry*, 27 (2013) 2717-2728.

16.T. Melo, N. Santos, D. Lopes, E. Alves, **E. Maciel**, M. AF Faustino, J. PC Tomé, M. GPMS Neves, A. Almeida, P. Domingues, M. A Segundo, M. R. M. Domingues, Photosensitized oxidation of phosphatidylethanolamines monitored by electrospray tandem mass spectrometry, *Journal of Mass Spectrometry*, 48 (2013) 1357-1365.

17.**E. Maciel**, R. N. da Silva, C. Simões, T. Melo, R. Ferreira, P.Domingues, M. R. M. Domingues, Liquid chromatography–tandem mass spectrometry of phosphatidylserine advanced glycated end products. *Chemistry and physics of lipids* 174 (2013) 1-7.

18.D.R. Santinha, M. Luisa Doria, B.M. Neves, **E. Maciel**, J. Martins, L. Helguero, P. Domingues, M. Teresa Cruz, M. Rosario Domingues, Prospective phospholipid markers for skin sensitization prediction in keratinocytes: A phospholipidomic approach, *Archives of Biochemistry and Biophysics*, 533 (2013) 33-41.

19.J. Monteiro, C. Pereira, A. Silva, **E. Maciel**, I. Baldeiras, F. Peixoto, M. Domingues, A. Jurado, P. Oliveira, Rapeseed oil-rich diet alters hepatic mitochondrial membrane lipid composition and disrupts bioenergetics, *Archives of Toxicology*, (2013) 1-13.

20.**E. Maciel**, R. Faria, D. Santinha, M.R.M. Domingues, P. Domingues, Evaluation of oxidation and glyco-oxidation of 1-palmitoyl-2-arachidonoyl-phosphatidylserine by LC–MS/MS, *Journal of Chromatography B*, 929 (2013) 76-83.

21.J.J. Villaverde, S.A.O. Santos, **E. Maciel**, M.M.Q. Simoes, C. Pascoal Neto, M.R.M. Domingues, A.J.D. Silvestre, Formation of oligomeric alkenylperoxides during the oxidation of unsaturated fatty acids: an electrospray ionization tandem mass spectrometry study, *Journal of mass spectrometry*, 47 (2012) 163-172.

- 22.D.R. Santinha, D.R. Marques, **E. Maciel**, C.S.O. Simoes, S. Rosa, B.M. Neves, B. Macedo, P. Domingues, M.T. Cruz, M.R.M. Domingues, Profiling changes triggered during maturation of dendritic cells: a lipidomic approach, *Analytical and Bioanalytical Chemistry*, 403 (2012) 457-471.
- 23.T. Melo, R.A. Videira, S. Andre, **E. Maciel**, C.S. Francisco, A.M. Oliveira-Campos, L.M. Rodrigues, M.R.M. Domingues, F. Peixoto, M.M. Oliveira, Tacrine and its analogues impair mitochondrial function and bioenergetics: a lipidomic analysis in rat brain, *Journal of Neurochemistry*, 120 (2012) 998-1013.
- 24.T. Melo, **E. Maciel**, M.M. Oliveira, P. Domingues, M.R.M. Domingues, Study of sphingolipids oxidation by ESI tandem MS, *European Journal of Lipid Science and Technology*, 114 (2012) 726-732.
- 25.R.N. da Silva, A.C. Silva, **E. Maciel**, C. Simoes, S. Horta, P. Laranjeira, A. Paiva, P. Domingues, M.R.M. Domingues, Evaluation of the capacity of oxidized phosphatidylserines to induce the expression of cytokines in monocytes and dendritic cells, *Archives of Biochemistry and Biophysics*, 525 (2012) 9-15.
26. **E. Maciel**, R.N. da Silva, C. Simoes, P. Domingues, M.R.M. Domingues, Structural Characterization of Oxidized Glycerophosphatidylserine: Evidence of Polar Head Oxidation, *Journal of the American Society for Mass Spectrometry*, 22 (2011) 1804-1814.
- 27.A. Reis, C. Fonseca, **E. Maciel**, P. Domingues, M.R.M. Domingues, Influence of amino acid relative position on the oxidative modification of histidine and glycine peptides, *Analytical and Bioanalytical Chemistry*, 399 (2011) 2779-2794.
- 28.**E. Maciel**, P. Domingues, D. Marques, C. Simoes, A. Reis, M.M. Oliveira, R.A. Videira, F. Peixoto, M.R.M. Domingues, Cardiolipin and oxidative stress: Identification of new short chain oxidation products of cardiolipin in in vitro analysis and in nephrotoxic drug-induced disturbances in rat kidney tissue, *International Journal of Mass Spectrometry*, 301 (2011) 62-73.
29. **E. Maciel**, P. Domingues, M.R.M. Domingues, Liquid chromatography/tandem mass spectrometry analysis of long-chain oxidation products of cardiolipin induced by the hydroxyl radical, *Rapid Communications in Mass Spectrometry*, 25 (2011) 316-326.

COMUNICAÇÕES EM ENCONTROS CIENTÍFICOS INTERNACIONAIS

1. Moreira, Ana S.P., Passos, Cláudia P., Simões, Joana, **Maciel, Elisabete**, NUNES, Fernando M., Domingues, Pedro, Domingues, M. Rosário, Coimbra, Manuel A. The relevance of non-enzymatic transglycosylation reactions for coffee melanoidins formation. 26th International Conference on Coffee Science” (ASIC 2016 China).
Poster communication
2. Da Costa, Elisabete; Melo, Tania; **Maciel, Elisabete**; Lillebo, Ana; Calado, Ricardo; Domingues, Pedro; Abreu, M. Helena and Domingues, M. Rosario How to use lipidomic tools in red and green seaweeds signature and bioprospection? *Codium tomentosum* and *Gracilaria* sp. as showcases. The 5th International Seaweed Conference, 27-28th September, 2016. Aveiro, Portugal. **Oral communication**

3. Moreira, A. S. P., **Maciel, E.**, Domingues, P., Nunes, F. M., Domingues, R. M., Coimbra, M. A., Non-enzymatic transglycosylation reactions in roasted foods: occurrence, catalysts and inhibitors. XIII Encontro de Química dos Alimentos. Porto, Portugal, 14-16 September 2016. **Poster communication**
4. **Maciel E.**, Melo T, Marques B., Domingues R., Calado R. and Lillebø A., Halophyte plants as a natural source of antioxidant compounds. COST FA1306 - The quest for tolerant varieties-phenotyping at plant and cellular level. 2nd General Meeting, April 18-20, 2016, Copenhagen, Denmark, **Poster communication**
5. **Elisabete Maciel**, Ricardo Calado, Ana Lillebø, Daniel Etilinc, Pedro Domingues and Rosário Domingues. “Valorization of autochthonous halophyte plants through hydrophilic interaction chromatography coupled to Q Exactive mass spectrometer” XVI Congresso Latino-Americano de Cromatografia (XVICOLACRO), January 5-9 de janeiro de 2016, Lisboa – **Best communication in LC-MS**
6. **Elisabete Maciel**, Bruna Marques, Ricardo Calado, Ana Lillebø and Rosário Domingues. “Plant lipidomics based on HILIC-MS to valorization of autochthonous halophyte plants” COST FA1306 - The quest for tolerant varieties-phenotyping at plant and cellular level. 1st General Meeting, June 22-24, 2015, IPK Gatersleben, Germany, **Oral communication**
7. Martins J., **Maciel E.A.**, Silva A., Domingues P., Neves B.M., Cruz M.T., Domingues M.R. (2015) Phospholipidomic profile variation on dendritic-like cells exposed to skin or respiratory sensitizers and respiratory irritant. Toxicology Letters. 238, 2, S235-S236.
8. Novais S.M., Domingues M.R., **Maciel E.**, Melo T., Vega-Naredo I., Oliveira P.J. (2015) Cardiolipin synthesis and modifications during P19 embryonic carcinoma cell differentiation. European Journal Of Clinical Investigation. 45, 54-54
9. **E. Maciel**, Identification oxPS by LC-MS. Evaluation of their effects on the inflammatory process. 1st Workshop-Lipidomics, 16 May 2012. University of Aveiro;
10. **E. Maciel**, Phosphatidylserine oxidation by Fenton Reaction: Recognition of oxidation of serine polar head by TLC and Mass Spectrometry, V Journeys of biochemistry “metabolic changes in disease”, 27 April 2011. University of Aveiro;
11. **E. Maciel**, Oxidative stress: Identification of short chain oxidation products of cardiolipin in nephrotoxic drug-induced disturbances, International courses on Toxicology 2010 “Survival or death as a matter of fatt”, 11-14 May 2010. University of Coimbra.
12. IO Goncalves, **E Maciel**, E Passos, JR Torrella, D Rizo, G Viscor, S Rocha-Rodrigues, E Santos-Alves, MR Domingues, PJ Oliveira, A Ascensao, J Magalhaes, Exercise improves liver mitochondria phospholipidomic profile and mitochondrial activity in non-alcoholic steatohepatitis, European Journal of Clinical Investigation 44 (2014) 56-56.
13. **E. Maciel**, Bruno M. Neves, Teresa Cruz, Pedro Domingues, M. Rosário M. Domingues, Identification of phosphatidylserine oxidized/glycated/glyco-oxidized products by LC-MS and the study of their anti-inflammatory properties, XIII Congress of the Iberian Society of Cytometry, 9-11 May 2013, University of Aveiro;
14. T. Melo, D. Santinha, R. N. da Silva, A. C. Silva, **E. Maciel** C. Simões, S. Horta, P. Laranjeira, A. Paiva, P. Domingues, M. R. M. Domingues Expression of cytokines in monocytes and

dendritic cells exposed to oxidized Phosphatidylserines, XIII Congress of the Iberian Society of Cytometry, 9-11 May 2013, University of Aveiro;

15. D. R. Santinha, T. Melo¹, M L. Doria, **E. Maciel**, C. Simões, S. Rosa, B. M. Neves, B. Macedo, M T. Cruz, P. Domingues, M R. M. Domingues, Profiling changes triggered by allergic contact dermatitis in dendritic cells and keratinocytes: a lipidomic approach, XIII Congress of the Iberian Society of Cytometry, 9-11 May 2013, University of Aveiro;

16. J.P. Monteiro, C. Pereira, **E. Maciel**, I. Baldeiras, F. Peixoto, M.R. Domingues, A.S. Jurado, P.J. Oliveira, Rapeseed oil-based diet alters rat hepatic mitochondria physiology and membrane composition, *European Journal of Clinical Investigation* 42 (2012) 74-74;

17. J.P. Monteiro, C. Pereira, **E. Maciel**, I. Baldeiras, F. Peixoto, M.R. Domingues, A.S. Jurado, P.J. Oliveira. The Influence of Diet in Rat Hepatic Mitochondria Physiology and Membrane Composition: Rapeseed Oil As a Case Study, *Journal of General Physiology* 138 (2011) 22A-22A;

18. **E. Maciel**, C. Simões, P. Domingues, R. M. Domingues. Study of influence of glycation on phosphatidylserine modifications under oxidative stress conditions by LC-MS/MS. XVII. Lipid-Meeting, 8-10 Dezembro 2011, Leipzig, Germany;

19. **E. Maciel**, R. N. da Silva, P. Domingues, M. R. M. Domingues. Identification of oxidative modifications in phosphatidylserine polar head using lipidómica approach. Lipid Maps annual meeting 2011 "Lipidomics Impact on Cell Biology, Cancer, and Metabolic Diseases", 2 - 3 May 2011, La Jolla, CA;

20. **E. Maciel**, R. N. da Silva, P. Domingues, M. R. M. Domingues Phosphatidylserine oxidation by Fenton reaction: oxidation of serine alpha carbon. XVII Congresso Nacional de Bioquímica, 15 - 17 December 2010, Porto;

21. P. Domingues, C. Simões, **E. Maciel**, M. R. Domingues. Evaluation of glycerophospholipids oxidation profile by LC-MS and MS/MS. 4th Portuguese Mass Spectrometry Meeting, 13- 15 de December 2010, FCUL;

22. **E. Maciel**, P. Domingues, D. Marques, C. Simões, A. Reis, M. R. M. Domingues Oxidation stress and cardiolipin: Identification of specific structural modifications by LC-MS/MS. Third European Workshop on Lipid Mediators, 3 and 4 June de 2010, Pasteur Institute, Paris;

23. A. Reis, **E. Maciel**, D. Marques, C. Simões, P. Domingues, R. A. Videira, M. M. Oliveira, F. Peixoto, M. R. Domingues The fate of phospholipids in mitochondria after gentamicin-induced nephrotoxicity. International courses on Toxicology 2010 "Survival or death as a matter of fatt", 11-14 May 2010. University of Coimbra;

24. **E. Maciel**, P. Domingues, D. Marques, C. Simões, A. Reis, M. R. M. Domingues, Oxidation of cardiolipin by the hydroxyl radical generated under Fenton conditions: Identification of short chain products by LC-MS/MS. 2nd Portuguese Young Chemist, 21- 23 April 2010, University of Aveiro;

25. D. Marques, **E. Maciel**, C. Simões, M. T. Cruz, M. R. Domingues Evaluation of phospholipids profile of dendritic cells using lipidomic approach. 2nd Portuguese Young Chemist, 21- 23 April 2010, University of Aveiro.

OTHER COMMUNICATIONS

1. **Elisabete Maciel**, Bruna Marques, Ricardo Calado, Ana Lillebø and Rosário Domingues. Characterization of Polar lipids in marine halophytes using MS-based lipidomics approach to their valorization. 5th Workshop of Lipidomics. June 1, 2016.

Oral communication

2. Ana Glória Ferreira, Ana Carolina Marques, Ana Isabel Lillebø, Ricardo Calado, **Elisabete Maciel**. Distribution of fatty acids in glycolipids and phospholipids of wild and aquaponic *Salicornia Ramosissima*. VIII Biochemistry Day da UA - The Big Challenges for Biochemistry April 20, 2016. **Poster communication**

3. Ana Carolina Marques, Ana Glória Ferreira, Rui Ferraz, Ana Isabel Lillebø, Ricardo Calado, **Elisabete Maciel**. Comparison of polar lipids profile in wild and aquaponics *Halimione portulacoides*. VIII Biochemistry Day da UA - The Big Challenges for Biochemistry April 20, 2016. **Poster communication**

11. ORGANIZATION COMMITTEE

1. . Organization and teaching of the course entitled "From the basics to LC-MS data acquisition and interpretation", integrated in the Curricular Unit of Advanced Courses in Biochemistry I, of the Doctoral Program in Biochemistry of the University of Aveiro. November 14 to 16, 2016..

2. Organization and teaching of the course entitled “From the basics to LC-MS data acquisition and interpretation” University of Aveiro April 30 to June 1, 2016

3. Organization and teaching of the course entitled “From the basics to LC-MS data acquisition and interpretation” University of Aveiro, February 3 to 5, 2016

4. Member of organize and scientific committee of Olympics semi-finals of Junior Chemistry, 2015 - University of Aveiro

5. Member of the Workshops organizing committee in lipidomics and Immunology conducted at the University of Aveiro in April 2013 and May 2015.