

Personal data

Cláudia Nunes dos Santos

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Academic degrees

2006-PhD in Biochemistry-FCL, Lisboa.

1993-degree in Biochemistry- FCL, Lisboa.

Previous and current scientific and/or professional activities

- From 1993 to 1995- post graduate student at ISA/ITQB;
- From 1996- 2006 PhD student at FCL/ITQB;
- From October 1998-October 1999- Assistant professor at Instituto Superior de Estudos Interculturais e Transdisciplinares from Instituto Piaget
- From 1st October 1999 to 31th October 2005- Assistant professor at Escola Superior Agrária from Santarém;
- Since October 2006 post-doc at ITQB/INSA and FF.

Area of scientific activity

Biochemistry and molecular biology

Present research interests

Study of the effect of plant phenolic compounds on neurodegenerative diseases that affect man, and of Parkinson's disease in particular. The main areas of research are: biochemical profiling of polyphenols extracted from selected plant sources; screening and selection of the polyphenols for biological activity (antioxidant and cytoprotective activities) in neuronal cell lines; effects on the rotenone-induced neurodegeneration cell model of Parkinson disease through the ubiquitin/proteasome pathway, a proteomic analysis and a transcriptomic analysis.

Other skills/activities

- Coordination of the Disease & Stress Biology (D&SB) research group-ITQB pole, in collaboration with Prof Ricardo Ferreira.
- Supervision of many final-year undergraduates (13), Master of Science (2) as well as other post-graduates (3). Currently involved in the supervision of 2 Ph.D. students and 1 Master of Science.
- Coordination of research project from Fundo EDP para a Biodiversidade "Conservation and Recovery of Threatened endemic Flora in Portugal"-IBET pole.
- Team member of 8 projects (national and EC).
- Member of collaborative network: Action 863: Euroberry Research: from Genomics to Sustainable Production, Quality & Health since 2007
- Member of Scientific societies: Portuguese Biochemical Society; Portuguese Society

of Plant Physiology; Groupe Polyphenols; GA-Society for Medicinal Plant and Natural Product Research.

Publications

In books:

- Ferreira, R., Monteiro, S., Freitas, R., Santos, C., Chen, Z., Batista, L., Duarte, J., Borges, A. and Teixeira, A. (2007), "Plant/Fungal Interactions Studied at the Molecular Level" in "Plant Pathology Concepts and Laboratory Exercises", Robert N. Trigiano, Mark T. Windham, Alan S. Windham Eds, 2nd Ed, CRC Press.

In International Scientific Journals:

- Santos, C. N. , Ferreira, R. B. , Teixeira, A. R. , (1997), " Seed proteins of *Lupinus mutabilis*", J. Agric. Food Chem., vol. 45, pp. 3821-3825.
- Santos, C. N. , Gaspar, M., Caeiro, A. S., Branco-Price, C., Teixeira, A. R. , Ferreira, R. B. , (2006), "Exposure of *Lemna minor* to arsenite: expression levels of the components and intermediates of the ubiquitin/proteasome pathway" Plant and Cell Physiology, vol. 47, 1262-1273.
- Ferreira, R.B., Monteiro, S., Freitas, R., Santos, C.N., Chen, Z., Batista, L.M., Duarte, J., Borges, A. and Teixeira, A.R. (2006) Fungal pathogens: The battle for plant infection. *Critical Reviews in Plant Sciences*, vol 25, 505-524.
- Ferreira, R.B., Monteiro, S., Freitas, R., Santos, C.N., Chen, Z., Batista, L.M., Duarte, J., Borges, A. and Teixeira, A.R. (2007) "The role of plant defence proteins in fungal pathogenesis", *Molecular Plant Pathology*, vol 8, 677–700.
- Menezes, R., Amaral, C, Batista-Nascimento, L., Santos, C., Eleutherio, E., Ferreira, R., Devaux, F., Rodrigues-Pousada, C. (2008) "Contribution of Yap1 towards *S. cerevisiae* adaptation to arsenic mediated oxidative stress" *Biochem. J.* vol 414, 301–311.
- Fortalezas, S., L Tavares, R. Pimpão, M. Tyagi, V. Pontes, P. Alves, G.J. McDougall, D. Stewart, R. Ferreira, C. N. Santos (2010) "Antioxidant properties and neuroprotective capacity of strawberry tree fruit (*Arbutus unedo*)". *Nutrients*, 2, 214-229
- L. Tavares, S. Fortalezas, C. Carrilho, G.J. McDougall, D. Stewart, R. B. Ferreira, C. Santos.(2010). "Antioxidant and antiproliferative properties of strawberry tree tissues", J Berry Research (in press).
- Tavares, L., Carrilho, D., Barata, D., Serra, T., Duarte, C., Feliciano, R., Bronze, R., Duarte, R., Chicau, P., Espirito-Santo, D., Teixeira, A., Ferreira, R. Santos, C. (2010) "Antioxidant capacity of Macaronesia traditional medicinal plants, *Molecules*, 15 : 2576-2592.
- Santos, C. N., Tavares, L., Martins, I.L., Ricardo, C.P., Teixeira, A. R. , Ferreira, R. B. , "Influence of the cell redox state on the response of *Lemna minor* proteome to arsenite" (under revision to Plant Physiology).
- Santos, C. N. , Rajasekhar, T.B., C., Teixeira, A. R. , Ferreira, R. B. , "Specific cations are involved in protein packaging inside *Lupinus albus* seed storage vacuoles" (submitted).
- Santos, C. N., Teixeira, A. R. , Ferreira, R. B. , "The supply of protein substrates for the ubiquitin/proteasome pathway depends upon the redox state of *Lemna minor* cells" (submitted).

- Carvalho, M., Santos, C. N., Caeiro, A. S., Monteiro, S., Teixeira, A. R., Ferreira, "Role of the Ubiquitin/proteasome pathway in *Vitis vinifera*/*Uncinula necator* compatible interaction" (submitted).
- Santos, C., Tavares, L., Carrilho, D., Barata, D., Serra, T., Duarte, C., Feliciano, R., Bronze, R., Duarte, R., Espirito-Santo, D., Teixeira, A., Ferreira, R. "Screening for antioxidant activities in Portuguese endemic plants with medicinal use", (in preparation).
- Santos, C., D. Duarte, D. Barata, L. Tavares, D. Carrilho, A. Teixeira, P. Alves, R. Ferreira. (2008) "Phytochemical evaluation of *Quercus* species- Antioxidant properties of *Q. suber* leaves in a neurodegeneration cell model", (in preparation).

Gene and protein sequences:

- 49 sequences submitted at NCBI

Abstracts in international scientific periodicals with referees:

- Tavares, L., R.C. Pimpão, C. Santos, G.J. McDougall, D. Stewart, R.B. Ferreira. 2009. Phytochemical characterization of *Juniperus* spp. leaves. 57th International Congress and Annual Meeting of the GA. August 16 – 20, Geneva, Switzerland. *Planta Med* 2009. 75: 923.
- Santos C, Tavares L, Fortalezas S, Carillho D, Pontes V, McDougall GJ, Stewart D, Ferreira RB. 2009. Neuroprotective and MMP-9 inhibitory activity of hydroethanolic extract of *Arbustus unedo* leaves. 57th International Congress and Annual Meeting of the GA. August 16 – 20, Geneva, Switzerland. *Planta Med* 2009. 75:924

Papers in conference proceedings with referee:

- Santos, C.N., Ferreira, R.B., Teixeira, A. N., Freitas, R. M., (1996) "Characterisation of *Lupinus mutabilis* (cv. Potosi) seed storage proteins", Proceedings of the Eighth International Lupin Conference, Pacific Grove, USA, pp 211-213.
- Santos, C.N., Ferreira, R.B., Teixeira, A. N., (1996) "Cold Tolerance studies with two *Lupinus mutabilis* cultivars", Proceedings of the Eighth International Lupin Conference, Pacific Grove, USA, pp 455-458.
- Santos, C., Ferreira, R., Teixeira, A., (1998), "Preliminary characterisation of a glycosidase possibly involved in the mobilisation of storage proteins from *Lupinus albus* seeds". Proceedings of the 3rd European Conference on Grain Legumes, Valladolid, Spain, pp296-297.
- Santos, C., Rajasekhar, T., Ferreira, R., Teixeira, A. (2004) "Cation content of the protein storage vacuoles from *Lupinus albus* cotyledons". Proceedings of the 10th International Lupin Conference, Laugarvatn, Iceland. pp.294-295.
- Carrilho, D., Tavares, L., Barata, D., Santos, C., Serra, T., Duarte, R., Duarte, C., Espirito-Santo, D., Teixeira, A., Ferreira, R. (2008) "Antioxidant properties and phytochemical analysis of an uncharacterized Portuguese endemic aromatic herb, *Thymus capitellatus*". Proceedings of the XXIVth International Conference on Polyphenols, Salamanca, Spain., vol 2 pp.467-469.
- Tavares, L., D. Barata, C. Santos, D. Carrilho, T. Serra, R. Feliciano, C. Duarte, R. Bronze, P. Oliveira, R. Ferreira. (2008). "Phytochemical characterization of leaf and root tissues from raspberry, including antioxidant activity evaluation. Proceedings of the XXIVth International Conference on Polyphenols. Salamanca, Spain., vol 1 407-409pp.
- Santos, C., D. Duarte, D. Barata, L. Tavares, D. Carrilho, T. Serra, A. Teixeira, C.

Duarte, P. Alves, R. Ferreira. (2008) "Phytochemical evaluation of Quercus species-Antioxidant properties of Q. suber leaves in a neurodegeneration cell model". Proceedings of the XXIVth International Conference on polyphenols. Salamanca, Spain., vol 2. 789-791pp.

- Santos, L. Tavares, D. Duarte, S. Esteves, V. Pontes, D. Carrilho, A. Teixeira, R. Ferreira (2008), "Poder antioxidante dos pequenos frutos e seus efeitos benéficos para a saúde humana", Proceedings of the "III Colóquio Nacional da Produção de Pequenos Frutos", Sever do Vouga, from 26 to 27 June, in press.

Communications

Oral communications by invitation

- Santos, C. N., Gaspar, M. E., Ferreira, R. B., Ricardo, C. P., Teixeira, A. R., (1995) "Aumento dos níveis de glicolato oxidase em Lemna minor em situações de choque térmico e na presença de metais pesados"; IV Congresso Luso-Espanhol de Fisiologia Vegetal, Estoril, from 3 to 6 October; Abstract no. 93
- Ferreira, R., Caeiro, A., Santos, C., Teixeira, A., (1996). "The plant 26S proteasome", 10 th Congress of the Federation of European Societies of Plant Physiology (FESPP), Florence, Italy, from 9 to 13 September. Abstract published in the special edition of Plant Physiology and Biochemistry, pp336-337, U-06.
- A. Caeiro, C. Branco, C. Santos, A. Teixeira, R. Ferreira (2002), "The Ubiquitin/proteasome Pathway from Lemna minor. Transcription of E1 and the 26S Proteasome During Heat Shock", XIII Congresso Nacional de Bioquímica, Lisboa, from 5 to 7 December, Abstract CS-1.
- Ferreira, R.B., Santos, C.N., Martins, P.D., Caeiro, A.S., Price, C.B., Teixeira, A.R. (2003), "Increase in E1 protein precedes its mRNA transcript accumulation during heavy metal stress (arsenite) in Lemna minor", VIII Congresso Hispano-Luso de Fisiologia Vegetal, Palma de Maiorca, from 16 to 20 September.
- Santos, C.N., (2007), "Search for plant phenolic compounds exhibiting antioxidant activity and neuroprotective properties in a neuronal cell model of Parkinson's disease" Small group meeting from the COST863 on small fruit production systems, Oeiras, from 8 to 10 November.
- Santos, L. Tavares, D. Duarte, S. Esteves, V. Pontes, A. Teixeira, R. Ferreira (2008), "Poder antioxidante dos pequenos frutos e seus efeitos benéficos para a saúde humana", III Colóquio Nacional da Produção de Pequenos Frutos, Sever do Vouga, de 26 a 27 de Junho.
- L.R. Tavares, C.N. Santos, G.J. McDougall, D. Stewart, R. B. Ferreira (2008), "Portuguese endemic wild blackberries as an alternative source of polyphenols and antioxidant activity", COST863 WG1 + WG4 Joint Meeting Bioactive compounds in berry fruits:genetic control, breeding, cultivar, analytical aspects and human health, Zurich, 3rd - 5th December 2008.
- C. Santos, L. Tavares, V. Pontes, P. Alves, R. Ferreira (2008)"Antioxydant capacity of portuguese endemic Rubus fruits in a neurodegeneration cell model", COST863 WG1 + WG4 Joint Meeting Bioactive compounds in berry fruits:genetic control, breeding, cultivar, analytical aspects and human health, Zurich, 3rd - 5th December 2008.
- L.R. Tavares, C.N. Santos, G.J. McDougall, S. Fortalezas, D. Carrilho, D. Stewart, R. B. Ferreira (2009), "Phytochemical Profiling Of Different Tissues From Portuguese Endemic Rubus Species", COST863 Management Committee and Workshop on

Defining needs of berry industries, Lisbon, 19th - 21st March 2009

Over 40 posters presented at scientific meetings, both national and international.