



Paulo Jorge Travessa Gavaia

PhD Biological Sciences - Molecular Biology

Curriculum Vitae

Jan, 2023

Personal Information

Name: Paulo Jorge Travessa Gavaia
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Current Scientific Positions

Since 08/2007 Associated researcher, Centre of Marine Sciences, University of Algarve, Faro, Portugal.

Since 09/2012 Invited assistant professor, Faculty of Medicine and Biomedical Sciences, University of Algarve, Faro, Portugal.

Previous Scientific Positions

08/2005-07/2007 Postdoctoral fellow, University of Algarve, Center of Marine Sciences, Faro, Portugal.

Recipient of post doctoral fellowship from FCT (SFRH/BPD/14528/2003) entitled “Studies on the skeletal development of teleosts: mechanisms of bone resorption during metamorphosis of the sole (*Solea senegalensis*) and establishment of an in vitro system to analyze the differentiation of mature osteoclasts”. My interests include the study of developmental, growth and resorption processes in teleost skeleton using in vivo and in vitro models using molecular biology, histology and immunohistochemical techniques.

12/1999-11/2003 PhD Student, University of Algarve, Faro, Portugal, and Instituto de Ciencias Marinas de Andalucía-CSIC, Cádiz, Spain

Recipient of PhD fellowship from FCT (PRAXIS XXI/BD/19665/99) entitled “Functional analysis of Bone related Gla proteins from bony fish during skeletal development”. During this period I have developed studies on skeletal development, gene cloning and expression analysis by *in situ* hybridization, sequence analysis, immunological assays and collaborated in training undergraduate students.

01/1998-11/1999 Young Investigator, University of Algarve, Faro, Portugal

Recipient of research initiation fellowship from FCT (PRAXISXXI/BIC/17159/98) ”Tratamentos vitaminicos e obtenção de ácidos nucleicos, em larvas e juvenis de dourada (*Sparus aurata*, L.)”

01/1996-12/1997 Laboratory technician, University of Algarve, Faro, Portugal

Recipient of laboratory technician fellowship from JNICT (PRAXIS/4/4.1/BTL/2987/96). This position required maintenance and larval rearing of gilthead sea bream larvae and juveniles, nucleic acid purification, gene cloning by PCR and expression analysis by RNA hybridization.

Academic degrees

2005- PhD in Molecular Biology by the University of Algarve, Faro

1999- Post-graduation in Aquaculture, University of Algarve, Faro.

1997- BSc in Marine Biology and Fisheries by the University of Algarve, Faro.

Research Areas and Technical Skills

Molecular Biology- Molecular determinants of mineralization; Expression and regulation of skeleton related genes, regulation of osteo-chondrogenic differentiation and osteoclastic resorption; Molecular and metabolic effects of vitamin K.

Histochemistry- Histology, immunochemistry, immunofluorescence.

Aquaculture- Larval rearing and assessment of fish quality. Development of larval skeleton, skeletal deformities and nutritional influences on growth and skeletogenesis. Influence of Vitamins nutrition on development of the skeleton and in reproduction

Patents

Inventors: L. Cancela, A.B. Brito, V. Laize, P. Gavaia, N. Afonso

Title: "INTEGRATED SCREENING METHOD"

N.^o Request: US 61/105,975

N.^o confirmation: 8119

Date of deposit in USA: October 16, 2008

Owners: UALG + Technophage

Awards

2010 BEST POSTER AWARD N. Richard, M. de Vareilles, **P.J. Gavaia**, T.S. Silva, O. Cordeiro, M. Yúfera, P.M. Rodrigues, L.E.C. Conceição 2010. Inclusion of protein hydrolysates in the diet of white seabream (*Diplodus sargus*) larvae: impacts on skeleton quality and larvae proteome expression. XIV International Symposium on Fish Nutrition and Feeding May 31- June 4, 2010, China

2012 First prize for Portugal and Spain in the contest of ideas CITRANSBET, for the creation of companies based on knowledge transfer, financed by project TRANS EBT and program FEDER – POCTEP (2007-2012). May 08, University of Huelva

2015 Third prize in the contest of scientific photography “Aos olhos do CCMAR” with the photo “50 cent”. Organized by CCMAR, February 04, 2015

2018 BEST POSTER AWARD Chaumel J, Dean M, Gonçalves J, **Gavaia PJ** 2018. Histological analysis of cartilages from *Raja undulata* (Rajidae). V Interdisciplinary Approaches in Fish Skeletal Biology, April 16-19, Tavira, Portugal.

2018 BEST POSTER AWARD Estremoz B, Simão M, **Gavaia PJ**, Cancela ML 2018. Phylogenetic and molecular characterization of *slc39a14* (zip14) zinc transporter in *Danio rerio*. V Interdisciplinary Approaches in Fish Skeletal Biology, April 16-19, Tavira, Portugal.

2018 BEST POSTER AWARD Diogo P, Nogueira R, Martins G, **Gavaia PJ**, Cabrita E 2018. Effect of water temperature and conductivity on the activation of zebrafish sperm motility. VII Iberian Congress of Ichthyology - SIBIC 2018, 12-15 June, University of Algarve Faro, Portugal.

2019 BEST POSTER AWARD Diogo P, Martins G, Marreiros A, **Gavaia PJ**, Cabrita E 2019. Cryoprotectants modulate skeletal development of zebrafish offspring. 7th International Workshop on the Biology of Fish Gametes. 2-6 September 2019, Rennes, France.

2021 BEST POSTER AWARD **Gavaia PJ**, Barata M, Oliveira C, Mendes AC, Soares F, Pousão-Ferreira P, Cabrita E 2021. Skeletal deformities in aquaculture produced greater amberjack *Seriola dumerili*. Aquaculture Europe 2021. 4-7 October 2021, Funchal-Madeira, Portugal.

2022 BEST POSTER AWARD Felix F, Silva N, Oliveira CCV, Cabrita E, **Gavaia PJ** 2022. *Plocamium cartilagineum* and *Sargassum vulgare* extracts modulate different spermatozoa traits in Senegalese sole. Aquaculture Europe 2022. 27-30 September, 2022, Rimini, Italy.

Scientific Courses and Training

1995- Colloquium “Gestão e Conservação da Fauna Piscícola das Águas Continentais Portuguesas”. October 28. F.C.U.L.- Lisbon, Portugal

1996- Seminar “Histofisiología e Histopatología de Espécies Marinas de Interés en Acuicultura”. Universidad de Cádiz, February 12-16 Cádiz, Espanha.

1997- Workshop “Potencialidades e perspectivas no cultivo do linguado, *Solea senegalensis*. January 18, University of Algarve, Faro, Portugal.

1998- “Curso de formação em protecção e segurança radiológica” Departamento de Protecção e Segurança Radiológica. University of Algarve, April 5-6. Faro, Portugal.

1998- “Ichtiopathology in Seabream and seabass”, Provimi Portugal, SA.; ProAqua Nutrición, SA.; ProAqua consulting. University of Algarve, June. Faro, Portugal.

2001- “III Leica Symposium - Cryomethods for in situ molecular identification” University of Barcelona September 3-4. Barcelona, Spain.

2004- “European Institute in Statistical Analysis” University of Algarve, July 19-28. Faro, Portugal.

2008- “Building a Successful International Research Career -Training Workshop” British Council Paris, February 18-20. Paris, France.

2008- “Fish in experimental research” IMM-FCUL- March 10-12. Institute of Molecular Medicine, Lisboa, Portugal.

2011- Practical course on the use of rodents, fish and amphibian in scientific research. University of Algarve, July 7-9. Faro, Portugal.

2012- Curso Teórico Categoria B – online. Ministrado pela Sociedade Portuguesa de Ciência em Animais de Laboratório (SPCAL). Ciências de Animais de Laboratório Curso Teórico online. 12-2012. University of Algarve, Faro Portugal. Approved in December 2012.

2013- “Handling, nutrition and feeding of meagre (*Argyrosomus regius*)”. Workshop, University of Algarve, Campus of Gambelas, December 19th 2013. Faro (Portugal).

2014- Workshop on Improving Zebrafish Husbandry - Towards Better Research and Animal Welfare. Champalimaud Foundation, November 7. Lisbon, Portugal.

Books and Book Chapters

Richard N., **Gavaia P.**, de Vareilles M., Silva T.S., Cordeiro O., Rodrigues P.M., Conceição L.E.C. **2012**. Two-dimensional proteomics as a tool to evaluate nutritional effects in farmed fish. pp 156-158. In: Rodrigues P., Eckersall D. & de Almeida A. [Eds.]. Farm animal proteomics. Proceedings of the 3rd Managing Committee Meeting and 2nd Meeting of Working Groups 1, 2 & 3 of COST Action FA1002. Wageningen Academic Publishers, Wageningen- The Netherlands. Doi: 10.3920/978-90-8686-751-6_37

Soares F., Monzón I., Costas B., **Gavaia P.J. 2014**. Non-infectious Disorders of Warm Water Fish Chapter 7. In: Woo P.T.K., Bruno D.W. & Lim L.H.S. [Eds], Diseases and Disorders of Finfish in Cage Culture, 2nd edition. CABI publishing. Pp 254-286. ISBN: 9781780642079. DOI: 10.1079/9781780642079.0254

Fernández I., **Gavaia P.J. 2016** Vitamin K, much more than blood clotting: An update on its roles metabolism and requirements in fish species. A mini-review. Avances en Nutrición Acuícola XIII. XIII Simposio Internacional de Nutrición Acuícola. Nuevo León (México). In: Cruz-Suárez L.E., Ricque-Marie D., Tapia-Salazar M., Nieto-López M.G., Villarreal-Cavazos D.A., Gamboa-Delgado J., Rivas Vega M. & Miranda Baeza A. [Eds]. Nutrición Acuícola: Investigación y Desarrollo. Universidad Autónoma de Nuevo León, San Nicolás de los Garza, Nuevo León, México, 2016 Pp. 361-376. ISBN: 978-607-27-0593-7.

Boglione C., **Gavaia P.**, Koumoundouros G., Gisbert E., Moren M., Fontagné S., Witten P.E. **2017**. Skeletal anomalies in reared European fish larvae and juveniles. Part 1: Normal and anomalous skeletogenic processes. In: Conceição L.E.C., and Tandler A. [Eds] Success factors for fish larval production. John Wiley & Sons, Oxford, UK. pp. 219-254. ISBN: 978-1-119-07216-4

Boglione C., Gisbert E., **Gavaia P.**, Witten P.E., Moren M., Fontagné S., Koumoundouros G. **2017**. Skeletal anomalies in reared European fish larvae and juveniles. Part 2: Main typologies, occurrences and causative factors. In: Conceição LEC, and Tandler A [Eds] Success factors for fish larval production. John Wiley & Sons, Oxford, UK. pp. 255-330. ISBN: 978-1-119-07216-4

Fernández I., **Gavaia P.J.**, Darias M.J., Gisbert E. **2018** Fat-soluble vitamins in fish: A transcriptional tissue-specific crosstalk that remains to be unveiled and characterized. In: Yufera M [Ed]. Emerging issues in fish larvae research. Springer International Publishing, New York, ISBN: 978-3-319-73243-5. DOI: 10.1007/978-3-319-73244-2_6

Kumar N., Carletti A., **Gavaia P.J.**, Muller M., Cancela M.L., Geurts P., Marée R. **2021**. Deep Learning Approaches for Head and Operculum Segmentation in Zebrafish Microscopy Images. In: Tsapatsoulis N., Panayides A., Theocharides T., Lanitis A., Pattichis C., Vento M. (eds) Computer Analysis of Images and Patterns. CAIP 2021. Lecture Notes in Computer Science, vol 13052. Springer, Cham. pp 154-164.
https://doi.org/10.1007/978-3-030-89128-2_15

Soares F., Costas B., Marques C., Monzón I., **Gavaia P.J. 2023**. Non-infectious Disorders of Warm Water Fish Chapter 7. In: Woo P.T.K., & Subasinghe, R.P. [Eds], Climate Change on Diseases and Disorders of Finfish in Cage Culture, 3rd edition. CAB International, Wallingford, Oxfordshire, England, UK. P. 488. Pp XXX-XXX. ISBN: 978-1-80062-162-6. DOI: 10.1079/9781800621640.0007

Fernandes J.M.O., Nedoluzhko A.V., Konstantinidis I., **Gavaia P. 2023**. Chapter 9. Epigenetics in fish growth. in: Piferrer F, XXXXX Wiley

Publications- Thesis

Gavaia P.J. 1997. Clonagem molecular da BGP de linguado *Solea senegalensis*. Thesis to obtain the degree of “licenciado” in Marine Biology and Fisheries – Specialty in Aquaculture, defended in December 15, 1997 at the University of Algarve, Faro, Portugal.

Gavaia P.J. 2005. Functional analysis of Bone related Gla proteins from bony fish during skeletal development. Thesis to obtain the degree of doctor in Biological Sciences - Molecular Biology, defended in July 14, 2005 at the University of Algarve, Faro, Portugal.

Publications- Peer-reviewed articles

Gavaia P.J., Sarasquete M.C., Cancela M.L. 2000. Detection of mineralized structures in very early stages of development of Marine Teleostei using a modified Alcian blue-Alizarin red double staining technique for bone and cartilage. *Biotechnic & Histochemistry* 75 (2): 79-84; doi: <https://doi.org/10.3109/10520290009064151>

Gavaia P.J., Dinis M.T., Cancela M.L. 2002. Osteological Development and Abnormalities of the Vertebral Column and Caudal Skeleton in Larval and Juvenile Stages of Hatchery Reared *Solea senegalensis* (Kaup). *Aquaculture* 211: 305-323; doi: [https://doi.org/10.1016/S0044-8486\(02\)00167-9](https://doi.org/10.1016/S0044-8486(02)00167-9)

Pinto J.P., Conceição N., **Gavaia P.J.,** Cancela M.L. **2003.** Matrix Gla protein gene expression and protein accumulation co-localize with cartilage distribution during development of the teleost fish *Sparus aurata*. *Bone* 32: 201 –210; doi: [https://doi.org/10.1016/S8756-3282\(02\)00981-X](https://doi.org/10.1016/S8756-3282(02)00981-X)

Simes D.C., Williamson M.K., Schaff B.J., **Gavaia P.J.,** Ingleton P., Price P.A., Cancela M.L. **2004.** Characterization of Osteocalcin (BGP) and Matrix Gla Protein (MGP) Fish Specific Antibodies: Validation for Immunodetection Studies in Lower Vertebrates. *Calcified Tissue International* 74: 170-180; doi: <https://doi.org/10.1007/s00223-003-0079-4>

Engrola S., Conceição L.E.C., **Gavaia P.J.,** Cancela M.L. Dinis M.T. **2005.** Effect of pre-weaning feeding regime on weaning performance of Senegalese sole, *Solea senegalensis* (Kaup, 1858). *Israeli Journal of Aquaculture* 57 (1): 10-18; (http://aquaculture.ocean.org.il/ija/57/57-1_10-18.pdf)

Ortiz-Delgado J. B., Simes D.C., **Gavaia P.J.,** Sarasquete C., Cancela M.L. **2005.** Osteocalcin and Matrix Gla Protein in developing teleost teeth. Identification of sites of mRNA and protein accumulation at single cell resolution. *Histochemistry and Cell Biology* 124 (2):123-130; doi: <https://doi.org/10.1007/s00418-005-0015-y>

Gavaia, P.J., Simes, D.C., Viegas C.S.B., Pinto J., Ortiz-Delgado J.B., Kelsh R.N., Sarasquete M.C., Cancela M.L. **2006.** Osteocalcin and Matrix Gla Protein in zebrafish (*Danio rerio*) and Senegal sole (*Solea senegalensis*): comparative gene and protein expression during larval development through adulthood. *Mechanisms of Development- Gene Expression Patterns* 6(6): 637-52; doi: <https://doi.org/10.1016/j.modgep.2005.11.010>

Simões B., Conceição N., Viegas C.S.B., Pinto J.P., **Gavaia P.J.,** Kelsh R.N., Cancela M.L. **2006.** Identification of a promoter element within the zebrafish Collagen Xα1 gene responsive to Runx2 isoforms Osf2/Cbfa1 and til-1 but not to pepb2αA2. *Calcified Tissue International* 79: 230-244; doi: <https://doi.org/10.1007/s00223-006-0111-6>

J. Sarrazin, P.M. Sarradin, A.G. Allais, D. Almeida, S. Bernagout, R. Bettencourt, E. Bonnivard, V. Brandou, P. Briand, M. Bruneaux, E. Buffier, J.B. Burnet, N. Byrne, F. Cardigos, E. Coiras, R. Cosson, D. Cottin, D. Cuvelier, S. Dentrecolas, P. Dorval, J. Dupont, M.C. Fabri, **P. Gavaia**, A. Godfroy, M. Gouillou, J. Gronemann, G. Hamel, M. Hamon, D. Higuet, U. Hoge, D. Jollivet, C. LeGall, P. Legendre, D. Leroux, F. Lesongeur, J. Legrand, P. Léon, J.P. Lévèque, I. Martins, H. Ondréas, V. Riou, P. Rodier, E. Sauter, E. Savino, L. Sebastiao, B. Shillito, P. Siméoni, A. Schultz, J.M. Sinquin, J.P. Sudreau, A. Tanguy, P. Taylor, R. Vuillemin, C. Waldmann and F. Zal. **2006.** Momareto : a cruise dedicated to the spatio-temporal dynamics and the adaptations of hydrothermal vent fauna on the Mid-Atlantic Ridge. *Interidge news* 15: 24-33

Stefanni S., Porteiro F., Bettencourt R., **Gavaia P.J.**, Santos R.S. **2007**. Molecular insights indicate that *Pachycara thermophilum* (Geistdoerfer, 1994) and *P. saldanhai* (Biscoito and Almeida, 2004) (Perciformes: Zoarcidae) from the Mid-Atlantic Ridge are synonyms species. *Molecular Phylogenetics and Evolution* 45: 423–426; doi: <https://doi.org/10.1016/j.ympev.2007.02.001>

Ronnestad I., **Gavaia P.J.**, Viegas C.S.B., Verri T., Romano A., Nilsen T.O., Jordal A.-E.O., Kamisaka Y., Cancela M.L. **2007**. Oligopeptide transporter PepT1 in Atlantic cod (*Gadus morhua* L.): cloning, tissue expression and comparative aspects. *J. Exp. Biol.* 210 (22): 3883 – 3896; doi: <https://doi.org/10.1242/jeb.007898>

Pittman K., Rønnestad I., **Gavaia P.**, Cancela M.L., Guerreiro P., Ribeiro L., Aragão C., Hamre K., Moren M., Yúfera M., Conceição L. **2007**. Fish Larval Research: a tool for sustainable food production and understanding environmental impacts on developing organisms. *Aquaculture Europe* 32 (4), 5-10.

Engrola S., Figueira L., Conceição L.E., **Gavaia P.J.**, Ribeiro L., Dinis M.T. **2009**. Co-feeding in Senegalese sole larvae with inert diet from mouth opening promotes growth at weaning. *Aquaculture* 288, 264-272; doi: <https://doi.org/10.1016/j.aquaculture.2008.12.010>

Vânia P. Roberto, Sofia Cavaco, Carla S.B. Viegas, Dina C Simes, Juan-Bosco Ortiz, Carmen Sarasquete, **Paulo J. Gavaia**, M. Leonor Cancela. **2009**. Matrix Gla protein in turbot (*Scophthalmus maximus*): Gene expression analysis and identification of sites of protein accumulation. *Aquaculture* 294, 202-211; doi: <https://doi.org/10.1016/j.aquaculture.2009.06.020>

Gavaia P.J., Domingues S.S., Engrola S., Drake P., Sarasquete C., M.T. Dinis, Cancela M.L. **2009**. Comparing skeletal development of wild and hatchery-reared Senegalese sole (*Solea senegalensis*, Kaup 1858): evaluation in larval and postlarval stages. *Aquaculture Research* 40 (14): 1585-1593; doi: <https://doi.org/10.1111/j.1365-2109.2009.02258.x>

Conceição L.E.C., Aragão C., Richard N., Engrola S., **Gavaia P.**, Mira S., Dias J. **2009**. Avanços recentes em nutrição de larvas de peixes. *Revista Brasileira de Zootecnia* 38: 26-35; doi: <https://doi.org/10.1590/S1516-35982009001300003>

Conceição L.E.C., Aragão C., Richard N., Engrola S., **Gavaia P.J.**, Mira S., Dias J. **2010**. Novel methodologies in marine fish larval nutrition. *Fish Physiology and Biochemistry* 36:1-16; doi: <https://doi.org/10.1007/s10695-009-9373-z>

Dámaso-Rodrigues M.L., Pousão-Ferreira P., Ribeiro L., Coutinho J., Bandarra N.M., **Gavaia P.J.**, Narciso L., Morais S. **2010**. Lack of essential fatty acids in live feed during larval and post larval rearing: effect on the performance of juvenile *Solea senegalensis*. *Aquaculture international* 18 (5): 741-757; doi: <https://doi.org/10.1007/s10499-009-9296-9>

Cunha M.E., Quental -Fereira H., Boglione C., Palamara E., **Gavaia P.**, Pousão-Fereira P. **2010**. Rearing fish larvae for extensive and semi-intensive aquaculture - the “natural” mesocosms system. *Aquaculture Europe* 35 (2): 23-26

Fonseca V.G., Rosa J., Laizé V., **Gavaia P.J.**, Cancela M.L. **2011**. Identification of a new cartilage-specific S100-like protein up-regulated during endo/perichondral mineralization in gilthead seabream. *Gene Expression Patterns* 11: 448–455; doi: <https://doi.org/10.1016/j.gep.2011.07.003>

Dionísio G., Campos C., Valente L.M.P., Conceição L.E.C., Cancela M.L., **Gavaia P.J.** **2012**. Effect of egg incubation temperature on the occurrence of skeletal deformities in *Solea senegalensis*. *Journal of Applied Ichthyology* 28: 471–476; doi: <https://doi.org/10.1111/j.1439-0426.2012.01996.x>

De Vareilles M., Richard N., **Gavaia P.J.**, Silva T.S., Cordeiro O., Yúfera M., Pousão-Ferreira P., Rodrigues P.M., Rønnestad I., Fladmark K.E., Conceição L.E.C. **2012**. Impact of dietary protein hydrolysates on skeleton quality and proteome expression in white seabream (*Diplodus sargus*) larvae. *Journal of Applied Ichthyology* 28: 477-487; doi: <https://doi.org/10.1111/j.1439-0426.2012.01986.x>

Cardeira J., Bensimon-Brito A., Pousão-Ferreira P., Cancela M. L., **Gavaia P. J.** 2012. Lordotic-kyphotic vertebrae develop ectopic cartilage-like tissue in Senegalese sole (*Solea senegalensis*). Journal of Applied Ichthyology 28: 460–463; doi: <https://doi.org/10.1111/j.1439-0426.2012.01978.x>

Cardeira J., Vallés R., Dionísio G., Estévez A., Gisbert E., Pousão-Ferreira P., Cancela M.L., **Gavaia P.J.** 2012. Osteology of the axial and appendicular skeletons of the meagre, *Argyrosomus regius* (Teleostei, Sciaenidae) and early skeletal development at two rearing facilities. Journal of Applied Ichthyology 28: 464–470; doi: <https://doi.org/10.1111/j.1439-0426.2012.01979.x>

Parameswaran V., Laizé V., **Gavaia P.J.**, Cancela M.L. 2012. ESSA1 embryonic stem like cells from gilthead seabream: A new tool to study mesenchymal cell lineage differentiation in fish. Differentiation 84: 240–251; doi: <https://doi.org/10.1016/j.diff.2012.07.004>

Pacchiarini T., Cross I., Leite R., **Gavaia P.**, Ortiz-Delgado J.B., Pousão-Ferreira P., Rebordinos L., Sarasquete C., Cabrita E. 2013. The *Solea senegalensis* vasa homologues: molecular characterization, tissue distribution and developmental expression profiles. Reproduction, Fertility and Development 25 (4), 646–660; doi: <https://doi.org/10.1071/RD11240>

Boglione C., **Gavaia P.**, Koumoundouros G., Gisbert E., Moren M., Fontagné S., Witten P. E. 2013. A review on skeletal anomalies in reared European larvae and juveniles. Part 1: Normal and anomalous skeletogenic processes. Reviews in aquaculture 5, S99-S120; doi: <https://doi.org/10.1111/raq.12015>

Boglione C., Gisbert E., **Gavaia P.**, Witten P. E., Moren M., Fontagné S., Koumoundouros G. 2013. A review on skeletal anomalies in reared European larvae and juveniles. Part 2: Main typologies, occurrences and causative factors. Reviews in aquaculture 5, S121-S167; doi: <https://doi.org/10.1111/raq.12016>

Cunha M.E., Ré P., Ferreira H.Q., **Gavaia P.J.**, Pousão-Ferreira P. 2013. Larval and juvenile development of dusky grouper, *Epinephelus marginatus* (Lowe, 1834), reared in mesocosm. J. Fish Biol. 83(3):448–65; doi: <https://doi.org/10.1111/jfb.12180>

Rocha F., Dias J., Engrola S., **Gavaia P.**, Geurden I., Dinis M.T., Panserat S. 2014. Glucose overload in yolk has little effects on the long term modulation of carbohydrate metabolic genes in zebrafish (*Danio rerio*). J Exp. Biol. 217:1139–1149; doi: <https://doi.org/10.1242/jeb.095463>

Richard N., Fernández I., Wulff T., Hamre K., Cancela M.L., Conceição L., **Gavaia P.J.** 2014. Dietary supplementation with vitamin K affects transcriptome and proteome of Senegalese sole, improving larval performance and quality. Marine Biotech. 16 (5): 522–537 doi: <https://doi.org/10.1007/s10126-014-9571-2>

Cabrita E., Martínez-Páramo S., **Gavaia P.J.**, Riesco M.F., Valcarce D.G., Sarasquete C., Herráez M.P., Robles V. 2014. Factors enhancing fish sperm quality and emerging tools for sperm analysis. Aquaculture 432: 389–401; doi: <https://doi.org/10.1016/j.aquaculture.2014.04.034>

Fernández I., Santos A., Cancela M.L., Laizé, V., **Gavaia P.J.** 2014. Warfarin, a potential pollutant in aquatic environment through vitamin K conserved roles in lower vertebrates (Teleost fish): Pxr signaling pathway and γ -glutamyl carboxylation of vitamin K dependent proteins. Environmental Pollution 194: 86–95; doi: <https://doi.org/10.1016/j.envpol.2014.07.015>

Laizé V., **Gavaia P.J.**, Cancela M.L. 2014. Fish: a suitable system to model human bone disorders and discover drugs with osteogenic or osteotoxic activities. Drug Discovery Today: Disease Models 13: 29–37; doi: <http://dx.doi.org/10.1016/j.ddmod.2014.08.001>

Rocha F., Dias J., Engrola S., **Gavaia P.**, Geurden I., Dinis M.T., Panserat S. 2015. Glucose metabolism and gene expression in juvenile zebrafish (*Danio rerio*) challenged with a high carbohydrate diet: effects of an acute glucose stimulus during late embryonic life. British Journal of Nutrition 113(03): 1–11; doi: <http://dx.doi.org/10.1017/S0007114514003869>.

Fernández I., Vijayakumar P., Cancela M.L., **Gavaia P.J.**, Laizé V. 2015. Zebrafish vitamin K epoxide reductases: expression in vivo, along extracellular matrix mineralization and under phylloquinone and warfarin in

vitro exposure. Fish Physiology and Biochemistry. 41(3): 745-759; doi: <http://dx.doi.org/10.1007/s10695-015-0043-z>

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Communications in panel

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187. Silva N, Sousa R, Roberto VP, Viegas M, Soares F, Marques C, Pousão-Ferreira P, **Gavaia PJ 2021**. Effect of macroalgae dietary supplementation on the resistance to pathogens in *Solea senegalensis*. Aquaculture Europe 21. 4-7 October 2021, Funchal-Madeira, Portugal.
188. Pes K, Martins G, Carletti A, Tarasco M, Diogo P, **Gavaia P 2021**. Dietary rotifers requirement for zebrafish optimal larval growth and skeletal development. Aquaculture Europe 21. 4-7 October 2021, Funchal-Madeira, Portugal.
189. Laizé V, Rosa JT, Carletti A, Pes K, Borges I, Engrola S, Serra V, Colen R, Cancela ML, **Gavaia PJ 2021**. Microalgae extracts as a dietary supplement to improve skeletal status in zebrafish *Danio rerio*

- and gilthead seabream *Sparus aurata*. Aquaculture Europe 21. 4-7 October 2021, Funchal-Madeira, Portugal.
190. Rosa JT, Carletti A, Marques CL, Ringeard H, Borges I, Barata M, Pousão-Ferreira P, **Gavaia PJ**, Cancela ML, Laizé V **2021**. Microalgae-supplemented diet improves the skeletal health of gilthead seabream *Sparus aurata* juveniles. Aquaculture Europe 21. 4-7 October 2021, Funchal-Madeira, Portugal.
 191. Rosa JT, Carletti A, Pes K, Borges I, Engrola S, Serra V, Colen R, Cancela ML, **Gavaia PJ**, Laizé V **2021**. Microalgae extracts as a dietary supplement to improve skeletal status in zebrafish *Danio rerio* and gilthead seabream *Sparus aurata*. Aquaculture Europe 2021, 4-7 October 2021, Funchal-Madeira, Portugal.
 192. Poudel S, Martins G, Cancela ML, **Gavaia PJ 2021**. FC46-MEK/ERK and cAMP/PKA mediate HIF-1 α signalling during mitochondrial antioxidant induced osteoblastogenesis. XXI SPB National Congress Biochemistry 14-16 October 2021. University of Évora, Évora, Portugal.
 193. Martins G, Poudel S, Castro DT, Guardiola F, **Gavaia PJ 2021**. The influence of inflammatory processes in fish skeletal developmental: crosstalk between skeletal and immune system. Encontro Anual do Colégio Doutoral, October 29, Loulé.
 194. Tarasco M, **Gavaia PJ**, Martins G, Castro DT, Silva N, Bebianno JM, Stainier DYR, Cancela ML, Laizé V **2021**. How microplastics and adsorbed pollutants affect zebrafish development? Encontro Anual do Colégio Doutoral, October 29, Loulé.
 195. Nascimento P, Santos JMA, **Gavaia PJ**, Bensimon-Brito A, Stainier DYR, Laizé V, Cancela ML **2022**. Studies towards the generation of Keutel Syndrome zebrafish models. 19th Edition of Portugaliæ Genetica- Phenotypic Manifestation of Genetic Heterogeneity. 24-25 March 2022. i3S, Porto, Portugal.
 196. Abreu RCR, Santos JMA, Rodrigues C, Borges I, **Gavaia PJ**, Laizé V, Cancela ML **2022**. Can zebrafish be a good model to study the onset of ectopic calcifications associated to mutant elastin? 19th Edition of Portugaliæ Genetica- Phenotypic Manifestation of Genetic Heterogeneity. 24-25 March 2022. i3S, Porto, Portugal.
 197. Poudel S, Martins G, Cancela ML, **Gavaia PJ 2022**. Resveratrol-mediated reversal of Doxorubicin-induced osteoclast differentiation alleviates oxidative stress via FoxM1 expression. European Calcified Tissue Society 7-19 May 2022, Helsinki, Finland.
 198. Santos JMA, Abreu R, Rodrigues C, Borges I, **Gavaia PJ**, Laizé V, Cancela ML **2022**. Zebrafish model to study mechanisms of ectopic mineralization associated to elastinopathies. III International Meeting of the Portuguese Society of Genetics, 27-28 June 2022, University of Évora, Évora, Portugal.
 199. Carletti A, Dellacqua Z, Rosa JT, Kumar N, Tarasco M, Marques CL, Barata M, Pousão-Ferreira P, Cancela ML, **Gavaia PJ**, Laizé V **2022**. Dietary supplementation with osteogenic extracts during the pre-ongrowing phase improves skeletal quality of gilthead seabream at the ongrowing phase. XX International Symposium on Fish Nutrition and Feeding - Towards Precision Fish Nutrition and Feeding. 5-9 June, Hilton Sorrento Palace Hotel, Sorrento, Italy.
 200. Santos JMA, Abreu RCR, Rodrigues C, Borges I, Conceição N, **Gavaia PJ**, Laizé V, Cancela ML **2022**. Zebrafish model to study mechanisms of calcium metabolism in elastin associated pathologies. IV Jornadas Algarve Biomedical Centre- Envelhecimento ativo e saudável. 7-9 October Moura, Portugal.
 201. Castro DT, Pinto G, Martins G, **Gavaia PJ 2022**. Impact of early and extended co-feeding with Artemia sp. or rotifers on growth performance and skeletal deformities of zebrafish larvae. 6th Aquaculture Research Workshop, outubro 19, Porto, Portugal.

202. Castro DT, Pinto G, Martins G, **Gavaia PJ 2022**. Extended co-feeding with Artemia sp. or rotifers promotes inter-individual homogeneity and enhances growth performance of zebrafish larvae. Aquaculture Europe 2022, Setember 27-30, Rimini, Italy.
203. Castro DT, Silva C, Gonçalves T, **Gavaia PJ, Laizé V 2022**. Mineralogenic and immunogenic effect of Phaeodactylum tricornutum extracts prepared from high pressure disrupted biomass. Aquaculture Europe 2022, Setember 27-30, Rimini, Italy.
204. Martins G, Pinto G, Poudel S, Castro DT, Santos JMA, **Gavaia PJ 2022**. Zebrafish scales an induced-inflammatory model for high-throughput screening of anti-inflammatory molecules. Aquaculture Europe 2022, Setember 27-30, Rimini, Italy.
205. Pinheiro F, Santos T, Martins G, Castro DT, Pes K, Pereira H, Diogo P, Varela J, **Gavaia PJ 2022**. Nutritional effects of *T. Verrucosa* fed rotifers in the growth development of zebrafish. Aquaculture Europe 2022, Setember 27-30, Rimini, Italy.
206. Pinto G, Castro DT, Martins G, Laizé V, **Gavaia PJ 2022**. Bioactivity of sulphated polysaccharides extracted from salt pan brine water in Fish. Aquaculture Europe 2022, Setember 27-30, Rimini, Italy.
207. Felix F, Silva N, Oliveira CCV, Cabrita E, **Gavaia PJ 2022**. *Plocamium cartilagineum* and *Sargassum vulgare* extracts modulate different spermatozoa traits in Senegalese sole. Aquaculture Europe 2022. 27-30 September, Rimini, Italy.
208. Diogo P, Costa J, Costa I, Bastos G, Castro DT, Castaldi M, Pes K, Pinheiro F, Rodrigues A, Marreiros A, Pereira H, del Pino V, Martins G, **Gavaia P, Varela J, Navalho J 2022**. Zebrabloom: novel microalgae products for zebrafish nutrition. 1st ZHA European Meeting 2022, October 10-11, 2022. The Francis Crick Institute, London, UK.
209. Martins G, Pinto G, Poudel S, Castro DT, Santos JMA, **Gavaia PJ 2022**. Zebrafish scales as a pre-screening tool for anti-inflammatory drug discover pipeline. VI Interdisciplinary Approaches in Fish Skeletal Biology (IAFSB) November 9-12, 2022, Olhão, Portugal.
210. Castro DT, Pinto G, Martins G, **Gavaia PJ 2022**. The use of live preys increase skeletal deformities of zebrafish larvae. VI Interdisciplinary Approaches in Fish Skeletal Biology (IAFSB) November 9-12, 2022, Olhão, Portugal.
211. Florio Furno M, Spina F, Ferrero D, Carletti A, **Gavaia PJ, Varese GC, Laizé V 2022**. The biopotential of marine fungi associated to microplastics as possible source of mineralogenic and osteogenic compounds. VI Interdisciplinary Approaches in Fish Skeletal Biology (IAFSB) November 9-12, 2022, Olhão, Portugal.
212. Laizé V, Fjelldal PG, Rosa JT, Gavaia PJ, Berntssen MHG, Lie KK 2022 Mycotoxins in vegetable based aquafeeds decrease mineralization in vitro and increase skeletal deformities in vivo. VI Interdisciplinary Approaches in Fish Skeletal Biology (IAFSB) November 9-12, 2022, Olhão, Portugal.
213. Pes K, Carletti A, Dellacqua Z, Martins G, Tarasco M, Diogo P, **Gavaia PJ 2022**. Establishing the dietary dose of rotifers for optimal larval growth and skeletal development in zebrafish. VI Interdisciplinary Approaches in Fish Skeletal Biology (IAFSB) November 9-12, 2022, Olhão, Portugal.
214. Poudel S, Martins Gil, Cancela ML, Gavaia PJ 2022. The Sirt 1 activator resveratrol counteracts the doxorubicin-induced effects on osteoclastogenesis. VI Interdisciplinary Approaches in Fish Skeletal Biology (IAFSB) November 9-12, 2022, Olhão, Portugal.
215. Poudel S, Martins G, Cancela ML, Gavaia PJ 2022. Regular supplementation with antioxidants rescues doxorubicin-induced bone deformities and mineralization delay in zebrafish. VI Interdisciplinary Approaches in Fish Skeletal Biology (IAFSB) November 9-12, 2022, Olhão, Portugal.

216. Rosa JT, Carletti A, Varela T, Gavaia PJ, Cancela ML, Laizé V 2022. Screening of marine osteoactive extracts using a zebrafish pipeline. VI Interdisciplinary Approaches in Fish Skeletal Biology (IAFSB) November 9-12, 2022, Olhão, Portugal.
217. Santos JMA, Rodrigues C, Abreu RCR, Borges I, Conceição N, Gavaia PJ, Laizé V, Cancela ML 2022. Loss of Elastin function is associated with improper calcium metabolism in zebrafish. VI Interdisciplinary Approaches in Fish Skeletal Biology (IAFSB) November 9-12, 2022, Olhão, Portugal.
218. Silva N, Roberto VP, Oliveira CCV, Cabrita E, Gavaia PJ 2022. Effect of phylloquinone-rich macroalgae supplementation on juvenile sole skeleton. VI Interdisciplinary Approaches in Fish Skeletal Biology (IAFSB) November 9-12, 2022, Olhão, Portugal.

Oral Communications in divulgation events

1. **Gavaia, P. J. 1997.** “O mar” Dissertation presented at Escola EB 2,3 Silves, October 10, Silves, Portugal.
2. **Gavaia P. J. 2004.** Identificação de Malformações Esqueléticas em Peixes. Feira de Inovação do Algarve, February, Loulé, Portugal
3. **Gavaia, P. J. 2005.** “Gene therapy”. Presentation to Secondary Schools in Algarve, Integrated in program “Os cientistas vão às escolas - Ciencia Viva”
4. **Gavaia, P. J. 2006.** “New toll for diagnostic”. Presentation to Schools in Algarve, Integrated in program “Os cientistas vão às escolas - Ciência Viva”
5. **Gavaia, P. J. 2006.** Identificação de Malformações em Peixes Cultivados. EXPOMAR, March, Olhão, Portugal.
6. **Gavaia P.J. 2007.** Melhoramento genético dos peixes: Selecção e transgénese. Café Oceano. February, BA, Faro Portugal.
7. **Gavaia P.J. 2007.** Skeletal deformities in farmed fish. DSM Nutritional Products – Customer Training Seminar. Center of Marine Sciences (CCMAR), May 29-31, Faro, Portugal.
8. Lidia Nicolau, Pedro Pousão-Ferreira, **Paulo J. Gavaia 2007.** Caracterização das malformações esqueléticas durante as primeiras fases do cultivo larvar de *Diplodus sargus* e *Diplodus vulgaris*. Jornada de divulgação e transferência de resultados de cooperação transfronteiriça Algarve-Andaluzia para a investigação e promoção de novos produtos aquicolas. Hotel Porta Nova, June 28, Tavira, Portugal.
9. **Gavaia P.J. 2008.** Avaliação esquelética de tratamentos nutricionais em Linguado. Jornada de divulgação e transferência de resultados de cooperação transfronteiriça Algarve-Andaluzia para a investigação e promoção de novos produtos aquicolas. IFAPA Centro Agua del Pino, April 29, Cartaya, Spain.
10. **Gavaia P.J. 2015.** Aprende a montar um aquário. Semana da Ciência e da Tecnologia. Centro Ciência Viva do Algarve, September 28, Faro, Portugal.
11. **Gavaia P.J. 2017.** Vitamin K in Fish Skeletal Biology. CCMAR SEMINARS 8th February, University of Algarve, Portugal
12. **Gavaia P.J. 2020.** Novos recursos marinhos para a melhoria dos peixes em aquacultura. Café Científico 23 Setembro 2020, Faro Portugal.
13. **Gavaia P.J. 2020.** Do laboratório para todos. Semana C&T 2020 no CCValg, 24 Novembro 2020. Online

Undergraduate Training

Domingues, Susana Filipa (2004) (nº18394) Estudo do efeito do Citral na morfologia do esqueleto de peixe zebra durante os primeiros estados de desenvolvimento. Tese de licenciatura Biologia Marinha e Pescas, University of Algarve, Faro. (Supervisors: M. Leonor Cancela and Paulo J. Gavaia)

Mota, Emilio (2006) Analysis of vitamin K and its antagonist Warfarin effects over bone development and vascular calcification in early life stages of zebrafish. Practical training, University of Algarve, Faro. (Supervisor: Paulo J. Gavaia)

Abrantes, Silvia Cristina (2007). Cultivo Larvar de *Diplodus sargus* – Impacto dos aspectos zootécnicos na incidência das malformações esqueléticas. Tese de licenciatura Biologia Marinha e Biotecnologia, I.P.L.- Escola Superior de Tecnologia do Mar, Peniche (Supervisors: T Mouga; P. Pousão-Ferreira and Paulo J. Gavaia)

Vicente, Ângela Vanessa (2007) (nº24975) “Peixe-zebra (*Danio rerio*): selecção de reprodutores, manutenção de ovos e larvas, cultivo e desenvolvimento”. Trabalho Experimental em Biologia Marinha, University of Algarve, Faro. (Supervisor: Paulo J. Gavaia)

Nunes, Cristóvão (2007) (nº21190) “Efeito da Temperatura no desenvolvimento do peixe zebra, *Danio rerio* (Hamilton-Buchanan, 1922)”. Trabalho Experimental em Biologia Marinha, University of Algarve, Faro. (Supervisor: Paulo J. Gavaia)

Cardeira da Silva, João (2007) (nº24991) “Peixe-zebra: selecção de reprodutores, manutenção de ovos e larvas, cultivo e desenvolvimento”. Trabalho Experimental em Biologia Marinha, University of Algarve, Faro. (Supervisor: Paulo J. Gavaia)

Peres dos Santos, Rui Pedro (2007) (nº25007) “Peixe-zebra (*Danio rerio*): selecção de reprodutores, manutenção de ovos e larvas, cultivo e desenvolvimento”. Trabalho Experimental em Biologia Marinha, University of Algarve, Faro. (Supervisor: Paulo J. Gavaia)

Eloise de Sá (2007) (nº24984) “Cultivo, manutenção de embriões e larvas de peixe-zebra (*Danio rerio*) - Efeito de diferentes dietas no crescimento larvar” Trabalho Experimental em Biologia Marinha, University of Algarve, Faro. (Supervisor: Paulo J. Gavaia)

Marujo, Débora (2007) (nº24981) “Peixe-zebra (*Danio rerio*): selecção de reprodutores, manutenção de ovos e larvas, cultivo e desenvolvimento” Trabalho Experimental em Biologia Marinha, University of Algarve, Faro. (Supervisor: Paulo J. Gavaia)

Silva, Ana Rita (2008) (nº24974) “Peixe-zebra (*Danio rerio*): selecção de reprodutores, manutenção de ovos e larvas, cultivo e desenvolvimento” Trabalho Experimental em Biologia Marinha, University of Algarve, Faro. (Supervisor: Paulo J. Gavaia)

Alves, Alexandra (2008) (nº24969) “Técnica de Biologia Molecular e Celular - Preparações histológicas definitivas com inclusão em parafina e coloração com Hematoxilina de Harris”. Trabalho Experimental em Biologia Marinha, University of Algarve, Faro. (Supervisor: Paulo J. Gavaia)

Silva, Maria João A. (2008) (nº24999) “Técnicas histoquímicas para análise de regeneração óssea no peixe zebra (*Danio rerio*) Hamilton-Buchanan, 1822”. Trabalho Experimental em Biologia Marinha, University of Algarve, Faro. (Supervisor: Paulo J. Gavaia)

Silva, Ana Catarina (2008) (nº29817) Marine Biology Degree “Efeitos do enriquecimento em vitamina K1 na performance e desenvolvimento esquelético do linguado Senegalês (*Solea senegalensis*, Kaup 1858)”. Projecto em Biologia Marinha, University of Algarve. (Supervisors: Paulo J. Gavaia and Luis Conceição)

Martins, Gil (2011) (nº35292) Marine Biology Degree “Avaliação dos efeitos das condições de cultivo larvar na qualidade do esqueleto em corvina (*Argyrosomus regius*). Projecto em Biologia Marinha, University of Algarve (Supervisors: Paulo J. Gavaia and Pedro Pousão Ferreira)

Rodrigues, César (2012) “Técnicas histológicas para detecção de lesões articulares em animais modelo”. Módulo de escolha do estudante. Mestrado Integrado em Medicina, University of Algarve, Faro. (Supervisors: Paulo J. Gavaia, M. Leonor Cancela)

Nunes, André (2012) (nº39040) Biomedical Sciences Degree “Vitamina K e o metabolismo ósseo” Trabalho de monografia. University of Algarve, Faro. (Supervisor: Paulo J. Gavaia)

Martins, Gil (2012) (nº 35292) “Avaliação deformações esqueléticas da corvina (*Argyrosomus regius*) sob diferentes condições de cultivo larvar”. Master in aquaculture, Trabalho Prático em Aquacultura. University of Algarve, Faro. (Supervisor: Paulo J. Gavaia)

Santos, Adriana (2012) (nº 40604) Biology Degree. “Efeitos da warfarina de sódio como inibidor da vitamina K no desenvolvimento larvar de peixe zebra (*Danio rerio*)” Unidade Curricular Projecto, subordinado ao tema University of Algarve, Faro. (Supervisors: Paulo J. Gavaia, M. Leonor Cancela)

Luis Granadeiro (2013) (nº 42245) Biomedical Sciences Degree “Effect of vitamin K epoxide reductase morpholino's injection on zebrafish early skeletal development” Trabalho de monografia. University of Algarve, Faro. (Supervisors: Paulo J. Gavaia, Ignácio Monzón)

Inge van der Knaap (2013) (nº 44456) Comparative osteology of sparids from aquaculture and wild. TPA University of Algarve, Faro. (Supervisor: Paulo J. Gavaia)

Francisca Felix (2014) (nº 50287) Radiographic evaluation of skeletal deformities in aquaculture produced fish: a comparison with visual selection methods. TPA discipline, University of Algarve, Faro. (Supervisor: Paulo J. Gavaia)

Francisco Bretes (2014) The effects of nutritional supplementing osteogenic molecules in bone development of zebrafish: The case of Zinc. Trabalho de monografia. University of Algarve, Faro. (Supervisors: Paulo J. Gavaia, Leonor Cancela)

Pedro Catela (2014) Efeitos da carga mecânica induzida por natação aumentada na regeneração do osso em peixe-zebra (*Danio rerio*). Projecto em Biologia Marinha, University of Algarve, Faro. (Supervisors: Paulo J. Gavaia, Vincent Laizé and João Cardeira)

Gonçalo Oliveira (2015). Effect of endurance exercise on caudal fin regeneration and de novo bone formation in zebrafish. Módulo de escolha do estudante. Mestrado Integrado em Medicina, University of Algarve, Faro. (Supervisors: Paulo J. Gavaia, Vincent Laizé)

Rita Fernandes (2015). Efeitos de análogos de vitamina D sobre o esqueleto de uma linha de peixe zebra modelo de diabetes. Módulo de escolha do estudante. Mestrado Integrado em Medicina, University of Algarve, Faro. (Supervisors: Paulo J. Gavaia, Ana Pimentel)

Matilde Costa (2015) (nº51328). Adaptive, Comparative and Functional Skeletal Biology lab (BIOSKEL) at the Centre of Marine Sciences (CCMAR). Trabalho Experimental em Biologia Marinha. Mestrado em Biologia Marinha. University of Algarve, Faro (Supervisors: Vincent Laizé and Paulo J. Gavaia)

Alexandra Pereira (2015). Efeitos da suplementação nutricional em estrôncio no crescimento e desenvolvimento esquelético de peixe zebra. Projecto em Biologia Marinha - Licenciatura em Biologia Marinha, University of Algarve, Faro (Supervisor: Paulo J. Gavaia)

Marco Tarasco (2015) (nº 51325) Breeding and husbandry of Zebrafish (*Dario rerio*). Trabalho Experimental em Biologia Marinha. Mestrado em Biologia Marinha. University of Algarve, Faro (Supervisors: Paulo J. Gavaia and Gil Martins)

Joana Pereira Firmino (2015) (nº 52351) Geração de uma linhagem transgénica de peixe-zebra para miR-20a. Trabalho Experimental em Biologia Marinha. Mestrado em Biologia Marinha. University of Algarve, Faro. (Supervisors: Paulo Gavaia, Daniel Tiago and Marta Vitorino)

João Ferreira (2015) (nº 51516) Geração de uma linhagem transgénica de peixe-zebra para miR-29a. Trabalho Experimental em Biologia Marinha. Mestrado em Biologia Marinha. University of Algarve, Faro. (Supervisors: Paulo Gavaia, Daniel Tiago and Marta Vitorino)

Mariana Cabral Monteiro Matos dos Santos (2015) (nº 53070) Generation of a zebrafish transgenic line for Mir 214. Trabalho Experimental em Biologia Marinha. Mestrado em Biologia Marinha. University of Algarve, Faro. (Supervisors: Paulo Gavaia, Daniel Tiago and Marta Vitorino)

Rodrigo Alexandre Prata (2016) O peixe como modelo para rastreio de drogas com aplicação biomédica: exemplo da diabetes. Módulo de escolha do estudante. Mestrado Integrado em Medicina, University of Algarve, Faro. (Supervisor: Paulo J. Gavaia)

Vanessa Margarida Moreira (2016) (nº 50561) Characterization of the coding sequence of VKORC1L1 gene in a zebrafish broodstock for future developmental studies regarding its embryonic function using an in vivo knock down approach (morpholino's microinjection). Trabalho monografia de final de curso - Licenciatura em Ciencias Biomédicas. University of Algarve, Faro. (Supervisors: Ignacio Fernández and Paulo J. Gavaia)

Ines de Almeida Mendes Marques de Carvalho (2016) (nº 49457) Efeitos do tratamento com dapsone no crescimento e desenvolvimento esquelético do peixe zebra (*Danio rerio*). Projecto de final de curso em Biologia, University of Algarve (Supervisors: Paulo J. Gavaia and João Cardeira)

Kevin Azevedo (2017) Effect of artesunate and dihydroartemisinin on bone development in zebrafish larvae. Módulo de escolha do estudante. Mestrado Integrado em Medicina, University of Algarve, Faro. (Supervisors: Paulo J. Gavaia and Vincent Laizé)

Domingos António D. R. Limpo Prata (2017) (nº 51584) Effects of the Fusarium micotoxin, moniliformin on osteoblastic differentiation and mineralization. Trabalho monografia de final de curso - Licenciatura em Ciencias Biomédicas. University of Algarve, Faro. (Supervisors: Paulo J. Gavaia and Vincent Laizé)

Cristina Florica Marcut (2017) (nº 52840) Effect of diabetes type I in the skeletal development of zebrafish. Trabalho monografia de final de curso - Licenciatura em Ciencias Biomédicas. University of Algarve, Faro. (Supervisor: Paulo J. Gavaia)

Rita Biltés Lopes Gonçalves Machado (2017) (nº 52919) Produção de uma linha de peixe zebra modelo para o estudo da osteopetrose. Projecto de final de curso em Biologia Marinha, University of Algarve (Supervisors: Paulo J. Gavaia and Daniel Tiago)

Walter Filipe da Costa Quadros (2017) (nº 52587) Rastreio de transgénicos de peixe-zebra com sobre-expressão de microRNAs com efeito no esqueleto. Projecto de final de curso em Biologia Marinha, University of Algarve (Supervisors: Paulo J. Gavaia and Daniel Tiago)

João Neves (2018) (nº 47191) Screening of natural extracts for new osteogenic molecules using the zebrafish model. Projeto de final de curso - Licenciatura em Ciências Biomédicas. University of Algarve, Faro. (Supervisors: Paulo J. Gavaia and Vincent Laizé)

Leonor da Silva Duarte (2018) (nº 54145) Effect of osteotoxicants on bone formation in zebrafish. Projeto de final de curso - Licenciatura em Ciências Biomédicas. University of Algarve, Faro. (Supervisors: Paulo J. Gavaia, Marco Tarasco and Vincent Laizé)

Inês Furtado Duarte (2018) (nº 54146) Efeito de suplementação nutricional com microalgas comerciais e microalgas transgénicas com sobreexpressão de lactoferrina. Projeto de final de curso - Licenciatura em Ciências Biomédicas. University of Algarve, Faro. (Supervisors: Paulo J. Gavaia, Marco Tarasco, Gil Martins and Vincent Laizé)

Rita Miranda das Neves (2018) (nº 54117) Screening of marine extracts for osteogenic compounds in zebrafish. Projeto de final de curso - Licenciatura em Ciências Biomédicas. University of Algarve, Faro. (Supervisors: Paulo J. Gavaia and Vincent Laizé)

Maria Leonor Ferrão (2019) (nº 63618) Osteology of the Sardine- First description and deformities. Field laboratory methods. Master in Marine Biology. University of Algarve, Faro. (Supervisor: Paulo J. Gavaia)

Ana Carolina Plácido Pereira (2020) (nº 60836) Os efeitos da BP-3 no desenvolvimento do esqueleto do peixe zebra e na mineralização. Projeto de final de curso - Licenciatura em Ciências Biomédicas. University of Algarve, Faro. (Supervisors: Paulo J. Gavaia and Marco Tarasco)

Vasco Miguel Barracha Gaspar (2020) (nº 60820) Osteogenic effects of marine derived extracts. Projeto de final de curso - Licenciatura em Ciências Biomédicas. University of Algarve, Faro. (Supervisors: Paulo J. Gavaia and Alessio Carletti)

Inês Carolina dos Santos Rodrigues (07/2021) (nº 64298) Efeitos osteotóxicos da Oxibenzona (BP3) no desenvolvimento do peixe-zebra. Projeto de final de curso - Licenciatura em Ciências Biomédicas. University of Algarve, Faro. (Supervisors: Paulo J. Gavaia and Marco Tarasco)

Miguel Pais (2021) (nº 64298) Efeitos de extractos derivados de fungos em peixe-zebra. Projeto de final de curso - Licenciatura em Ciências Biomédicas. University of Algarve, Faro. (Supervisors: Paulo J. Gavaia and Vincent Laizé)

Djanira Valéria Campos do Nascimento (2021) (nº 54509) Microinjeção em peixe-zebra: uma abordagem molecular. Laboratory Methods - Master in Marine Biology. University of Algarve, Faro. (Supervisors: Paulo J. Gavaia; Gil Martins)

Carolina de Deus Rodrigues (07/2021). Expressão da proteína Mgp nas estruturas oculares do peixe zebra: contribuição para estudos sobre a síndrome de Keutel. Licenciatura Biomedical Sciences, University of Algarve. (Supervisors: Leonor Cancela and Paulo Gavaia)

João Bruno Morais Vieira (07/2021) Colocalização da expressão das proteínas MGP e elastina nas estruturas cartilagíneas no peixe zebra. Licenciatura in Biomedical Sciences, University of Algarve. (Supervisors: Leonor Cancela and Paulo Gavaia)

Francisco Gonçalves (07/2022) Growth performance of *Brachionus rotundiformis* cultivated using different diets. Field methods - Master in Aquaculture and Fisheries (Supervisors: Paulo J. Gavaia; Daniela Castro)

João Gil Ferreira (07/2022) The influence of enriched live feed in the larval period of Zebrafish (*Danio rerio*). Field methods - Master in Aquaculture and Fisheries (Supervisors: Paulo J. Gavaia; Daniela Castro)

Larissa Kussaba Miguel (07/2022) (nº 59622) Trabalho prático. Mestrado em Ciências Biomédicas – Mecanismos de Doenças. Estágios Optativos em Laboratório (Supervisor: Paulo J. Gavaia)

Catarina Miguel Silva (07/2022) (nº 67651) Mineralogenic and immunogenic effects of microalgae extracts *in vitro*. Projeto de final de curso - Licenciatura em Ciências Biomédicas. University of Algarve, Faro. (Supervisors: Paulo J. Gavaia and Vincent Laizé)

Graduate Training

MSc

Vânia Cristina da Palma Roberto (2006) "Characterization of the skeletal development of *Pagrus auriga* and *Scophthalmus maximus* through histological methods". International Masters in Aquaculture, University of Algarve (Supervisors: M. Leonor Cancela and Paulo J. Gavaia).

Rita Vanessa Cardoso de Almeida Rainha (2008) "Estudo da Variabilidade genética de marcadores moleculares ligados ao gene da MGP e sua aplicação para paternidades em *Sparus aurata*". Master thesis in Marine Biology, University of Algarve (Supervisors: M. Leonor Cancela, Sara Mira and Paulo J. Gavaia)

João Cardeira da Silva (**2009**) “Efeito da dieta e da inanição na performance larvar e no desenvolvimento de peixe-zebra (*Danio rerio*): caso específico do desenvolvimento esquelético”. Master in Marine Biology, University of Algarve (Supervisors: M. Leonor Cancela, Paulo J. Gavaia and A. B. Brito)

Rui Pedro Peres dos Santos (**2009**) “Identificação de efeitos de xenobioticos in vivo no desenvolvimento do osso em peixe zebra (*Danio rerio*)”. Master in Marine Biology, University of Algarve (Supervisors: M. Leonor Cancela, Paulo J. Gavaia and A. B. Brito)

Gil Sales Marques Martins (**2013**) “Determinação dos requisitos nutricionais em proteína e lípidos em nutrição de peixe zebra. Efeitos no crescimento e no desenvolvimento esquelético. Master in Marine Biology, University of Algarve (Supervisors: Paulo J. Gavaia and Jorge Dias)

Tiago Rocha (**2013**) VK deficiency at different developmental windows in Senegalese sole. Master in Marine Biology, University of Algarve (Supervisors: Paulo J. Gavaia and Ignácio Monzón)

Luis Carlos Serrachino Granadeiro (**2015**) “Effects of vitamin K deficiency and its mechanisms in vertebrate's early development: zebrafish as a model.” Master in Biomedical Sciences, University of Algarve, Faro. (Supervisors: Paulo J. Gavaia, Ignácio Monzón)

Mariana Cabral Monteiro Matos dos Santos (**2016**) “Characterization of microRNAs expression in the skeletal development of Zebrafish”. Master in Marine Biology, University of Algarve (Supervisors: Paulo Gavaia, Daniel Tiago)

Rui Miguel dos Santos Pereira (**2018**) “O efeito da qualidade da proteína na condição de juvenis de corvina (*Argyrosomus regius*)” Master in Aquaculture and Fisheries, University of Algarve (Supervisors: Paulo Gavaia, Laura Ribeiro)

Matthew Castaldi (**2018**) “Development and implementation of microalgae formulations for the culture of zebrafish” Master in Aquaculture and Fisheries, University of Algarve (01/2020) (Supervisors: Paulo Gavaia, João Varela)

Daniela tomás de Castro (**2019**) “Development of a commercial microalgae enrichment for optimizing zebrafish reproduction” Master in Aquaculture and Fisheries, University of Algarve (07/2021) (Supervisors: Paulo Gavaia, Hugo Pereira)

Filipa Maria Ribeiro Pinheiro (**2020**) “Nutritional effects of rotifers fed microalgae combinations on growth and development of zebrafish” Master in Aquaculture and Fisheries, University of Algarve (11/2022) (Supervisors: João Varela, Paulo Gavaia)

Inês Borges (**2020**) “Validation of zebrafish as a model for Keutel syndrome” Master in Biomedical Sciences, University of Algarve (11/2021) (Supervisors: Leonor Cancela, Paulo Gavaia)

Pedro Manuel Fortes Nascimento (**2021**) “Study of Matrix Gla Protein (MGP) deficiency in the zebrafish and its interaction with Elastin. Contribution to the study of Keutel syndrome”. Master in biotechnology, University of Algarve (Supervisors: João M. Almeida Santos, Paulo Gavaia)

Gonçalo Pereira de Castro Pinto (**2021**) “Sulphated polysaccharides extracted from brine water and its effects on fish immune response” Master in Aquaculture and Fisheries, University of Algarve (Supervisors: Paulo Gavaia, Florbela Soares)

PhD

Filipe Ricardo Pires de Carvalho- PhD student **2012-2015** - Characterization of bone pathologies in the AKITA mouse, a new model for diabetes insulin-dependent: contribution for a better understanding of this disease

in humans. Supported by Fundação para a Ciência e a Tecnologia. (Supervisors: M. Leonor Cancela, Paulo J. Gavaia and Gabriela Silva)

Patricia Diogo - PhD student **2014-2018** - Cryopreservation of zebrafish germ cells: technological improvements and methodological standardization for gene banking and management. Supported by Fundação para a Ciência e a Tecnologia. (Supervisors: Paulo J. Gavaia, Elsa Cabrita and Leonor Saúde)

João Pedro Cardeira da Silva **2014-2018** *Mechanisms of de novo bone formation in a fish model of fin regeneration.* (Supported by Fundação para a Ciência e a Tecnologia através do programa doctoral ProRegM - Universidade do Algarve. (Supervisors: Paulo J. Gavaia and Vincent Laizé)

Alessio Carletti 01-2019 to 12-2021. Effects of marine derive extracts on mineralogenesis. H2020 Marie Skłodowska-Curie Actions Innovative Training Network No 766347- BioMedAqu. (Supervisors: Paulo Gavaia and Leonor Cancela)

Sunil Poudel 01-2019 to 12-2021. Effects of anti- and pro-oxidants in bone mineralization. H2020 Marie Skłodowska-Curie Actions Innovative Training Network No 766347- BioMedAqu. (Supervisors: Leonor Cancela and Paulo Gavaia)

Leticia Lujan 08-2019 to 07-2022 Osteological effects of dietary lipid modulation in aquaculture produced meagre. H2020 Marie Skłodowska-Curie Actions Innovative Training Network No 766347- BioMedAqu. (Supervisors: Laura Ribeiro and Paulo Gavaia)

Gil Sales Marques Martins 02-2020 to 01-2024 The influence of inflammatory processes in fish skeletal development: the crosstalk between skeletal and immune systems. Supported by Fundação para a Ciência e a Tecnologia. (Supervisors: Paulo Gavaia and Francisco Guardiola)

Ana Sofia Santos Gomes 03-2022 to 02- 2026. Environmental response and transgenerational effects of ocean warming and nutrition on edible sea urchins: Implications for harvesting and aquaculture. Supported by Fundação para a Ciência e a Tecnologia (2021.07188.BD). (Supervisors: Silvia Lourenço, Paulo Gavaia and Coleen Suckling)

Post-Graduate Training

2012-2017 Ignacio Fernández Monzon “Integrative roles of Vitamin K: nutritional requirements for better bone development.” Post-doctoral fellowship FCT (SFRH/BPD/82049/2011)

2018-2021 Vânia Cristina da Palma Roberto “Development and implementation of food supplemented in seaweed rich in vitamin K in the cultivation of sole (*Solea senegalensis*). Post doctoral research Grant (UALG 075/2017)

Thesis Commissions

Sara Sousa **2009.** Bone dynamics during adult zebrafish caudal fin regeneration. Under supervision of Antonio Jacinto IMM

Tomás Pais do Azevedo **2011.** A comparative view on zebrafish and chicken vertebral centrum development. Under supervision of Isabel Palmeirim DCBM-UALG

Maritza Pérez Atehortúa **2022** Estudio de las malformaciones de corion en embriones de salmón del atlántico (*Salmo salar*), con base en la evaluación de biomarcadores de aspectos químicos, ultraestructurales y nutricionales como herramientas predictivas de su calidad. Evaluator on the committee for “Examen de Suficiencia Investigativa”. Doctorado en Ciencias Agropecuarias, Universidad Católica de Temuco.

Jury for Academic Degrees

PhD

2008 Ana Rodriguez de la Rua Franch: Estudio del ciclo reproductor y la talla mínima de madurez de moluscos bivalvos y cefalópodos de interés pesquero en las costas Andaluzas. **Gavaia, P.J.** Supp. Examiner in PhD Thesis in Marine Sciences. University of Cádiz, Spain. Jury: Uxio Labarta, Carmen Rendon, Maria Jose Fernandez, Juan Bosco Ortiz.

2009 Irma Sánchez Ramos: Desarrollo de RFLPs en genes relacionados con el crecimiento en dorada (*Sparus aurata*): aislamiento, caracterización y localización cromosómica. **Gavaia, P.J.** Supp. Examiner in PhD Thesis in Marine Sciences. University of Cádiz, Spain. Jury: Pombo, A.I., Dinis, M.T., Rebordinos, L.

2011 Ignacio Valentín Fernández Monzón: Hypervitaminosis A effects on *Sparus aurata* and *Solea senegalensis*: characterization of larval performance and the underlying gene expression of abnormal skeletogenesis. PhD Thesis in Aquaculture. University of Barcelona, Spain. Jury: **Gavaia, P.J.**, Planas Vilarnau, J., Navarro Álvarez I.

2012 Tiziana Pacchiarini “El factor maternal vasa como marcador molecular para la caracterización de las Células Germinales/CG en dos especies de peces planos: el lenguado senegalés (*Solea senegalensis*) y el rodaballo (*Scophthalmus maximus*). Aplicaciones Biotecnológicas en Acuicultura. PhD Thesis in Biological sciences. University of Cadiz, Spain. Jury: **Gavaia, P.J.**, Herraez, M. P., Mañanos, E.

2013 Anais Boglino “The role of dietary lipids and essential fatty acids in the processes of skeletogenesis and pigmentation in Senegalese sole (*Solea senegalensis*, Kaup, 1858) larvae”. PhD Thesis in Aquaculture. University of Barcelona, Spain. Jury: **Gavaia, P.J.**, Moren M., Gutiérrez J.

2013 Maria Catarina Murteira Rico dos Santos Campos “Thermal epigenetic of muscle growth and development in the (Senegalese sole *Solea senegalensis* Kaup, 1858)”. PhD Thesis in Biomedical Sciences. ICBAS - University of Porto, Portugal. Jury: Johnston I. A.; Henrique R.F., Lobo da Cunha A., **Gavaia P.J.**, Fernandez J.M.O., Valente L.M.

2015 Wilfrido Argüello Guevara “SERIOLA culture”. PhD Thesis in Sciences, Marine Aquaculture. Universidad Católica del Norte, Chile. Jury: **Gavaia P.J.**,

2015 Jessica Aceto. “Effects of hypergravity and simulated microgravity on the general and bone physiology of zebrafish larvae”. Doctorat en Sciences. Faculty of Sciences, University of Liège, Belgium. Jury: M. M. Thiry (Président), **P. J. Gavaia** (Universidade do Algarve), V. Geenen, L. Grobet, Ch. Lambert (Secrétaire), M. Muller (Promoteur), E. Witten (Gent Universiteit).

2016 Filipe Carvalho. “Characterization of bone pathologies in the AKITA mouse, a new model for diabetes insulin-dependent: contribution for a better understanding of this disease in humans”. PhD Thesis in Biomedical Sciences. University of Algarve. Jury: Isabel Palmeirim, M. P. Macedo, M. Gomes, Sara Sousa, M. Leonor Cancela, **Paulo J. Gavaia**, Gabriela Silva

2017 Ana Manuela de Azevedo Gomes. “Characterization of the vertebral anomalies in different phases of the production of senegalese sole (*Solea senegalensis*): stereoscopic, radiographic and histological approach”. PhD Thesis in Veterinary Sciences. University of Santiago de Compostela. Jury: **Paulo Jorge Gavaia** (President), Francesc Padrós Bover, M. Carmen Bouza Fernandez

2018 João Pedro Gonçalves Cardeira da Silva. “Mechanisms of de novo bone formation in a fish model of fin regeneration”. PhD Thesis in Mechanisms of Disease and Regenerative Medicine. University of Algarve. Jury: M. Leonor Cancela (president), Didier Stainier, M. Leonor Saúde, Juan Fuentes, **Paulo J. Gavaia**.

2019 Patrícia Alexandra Cavaleiro Diogo. “Cryopreservation of zebrafish germ cells: technological improvements and methodological standardization for gene banking and management”. PhD Thesis in Ciências do Mar, da Terra e do Ambiente, ramo Ciências Biológicas, especialidade

Fisiologia Animal. University of Algarve. Jury: Sérgio M. M. Jesus (President), Juan Francisco Asturiano, Ákos Horvát, **Paulo Jorge Gavaia**, Catarina Cortes V. Oliveira.

2021 Lisa Maylin Schueler. “Improvement of microalgal biomass using physiological and genetic approaches” PhD Thesis in Ciências do Mar, da Terra e do Ambiente, University of Algarve. Jury: Sérgio Manuel Machado Jesus (President), Maria João Gante de Vasconcelos Barbosa, Ana de Jesus Branco de Melo Amorim Ferreira, Luísa Maria Gouveia da Silva, **Paulo Jorge Gavaia**, João Carlos Serafim Varela.

2022 Javier Arturo Cantillo Acosta. “Fishery and aquaculture products in the EU: an analysis of consumers’ preferences, producers’ risk management and stakeholders’ labelling preferences”. PhD in Sustainable Aquaculture and Marine Ecosystems University of Las Palmas de Gran Canaria and PhD in Economics and Management University of Liège. External referee **Paulo Gavaia**

2022 Tomás Augusto Barreiros Pais De Azevedo. “An evo-devo approach to vertebral body development: Going back to progenitors”. PhD Thesis in Ciências Biomédicas, University of Algarve. Jury: Isabel Palmeirim, Bertrand Bénazéraf, Hélia Cristina de Oliveira Neves, **Paulo Jorge Gavaia**, Martin Catala.

2022 Caroline Caetano da Silva. “Génétique de l'ostéoporose précoce: identification de WNT11 comme nouveau gène et études de son implication dans les voies de signalisation Wnt”. Thèse de Doctorat Specialité - Biothérapies et biotechnologies, d'Université de Paris Cité Jury: Sylvie Babajko, Corinne Collet, Isabelle Gennero, Giovanni Levi, Massimiliano Rossi, **Paulo Gavaia**

MSc

2006 Vania Cristina Palma Roberto. “Characterization of the skeletal development of *Pagrus auriga* and *Scophthalmus maximus* through histological methods”. Dissertação (Aquacultura) - Universidade do Algarve. Jury: Paulo J. Gavaia, Leonor Cancela, Ann Huysseune.

2008 Rita Vanessa Cardoso Rainha. “Estudo da Variabilidade genética de marcadores moleculares ligados ao gene da MGP e sua aplicação para paternidades em *Sparus aurata*”. Dissertação (Biologia Marinha e Pescas) - Universidade do Algarve. Jury: Paulo J. Gavaia, Leonor Cancela, Sara Mira.

2009 João Cardeira da Silva. “Efeito da dieta e da inanição na performance larvar e no desenvolvimento de peixe-zebra (*Danio rerio*): caso específico do desenvolvimento esquelético”. Dissertação (Biologia Marinha e Pescas) - Universidade do Algarve. Jury: Paulo J. Gavaia, Leonor Cancela, Laura Ribeiro.

2009 Rui Pedro Peres dos Santos. “Identificação de efeitos de xenobioticos in vivo no desenvolvimento do osso em peixe zebra (*Danio rerio*)”. Dissertação (Biologia Marinha e Pescas) - Universidade do Algarve. Jury: Paulo J. Gavaia, Leonor Cancela, Antonio Jacinto; Nuno Afonso.

2012 Pedro Emanuel Ferreira dos Reis Vieira. “Amino acid toxicity in Zebrafish. (Toxicidade de aminoácidos em Peixe-zebra)”. Dissertação (Biologia Aplicada ramo Biologia Molecular e Celular) - Universidade de Aveiro. Jury: Paulo J. Gavaia, Manuel Antonio da Silva Santos.

2013 Joana Rita Silva Caria. “Assessment of the mineralogenic toxicity of aquatic pollutants”. Dissertação (Biologia Molecular e Microbiana). Universidade do Algarve. Jury: Vincent Laizé, Paulo J. Gavaia, Jorge Dias.

2013 Mónica Mateus. “Avaliação da qualidade durante o cultivo larvar de mero *Epinephelus marginatus*”. Dissertação (Aquacultura) Instituto Politécnico de Leiria. Jury: Ana Violante Pombo, Paulo J. Gavaia, Laura Ribeiro.

2014 Gil Sales Marques Martins “Determinação dos requisitos nutricionais em proteína e lípidos em nutrição de peixe zebra. Efeitos no crescimento e no desenvolvimento esquelético. Dissertação (Aquacultura e Pescas, especialização em Aquacultura). Universidade do Algarve. Jury: Karim Erzini, Sonia Paramo-Rodriguez, Wilson Pinto, Paulo J. Gavaia, Jorge Dias.

2014 Carmen Lucía Barrios Guzmán. “Modulation of bone metabolism and mineralization in gilthead seabream (*Sparus aurata*) fed various vegetable oil sources”. Dissertação (Aquacultura e Pescas, especialização em Aquacultura). Universidade do Algarve. Jury: Adelino Canário, Paulo J. Gavaia, Jorge Dias.

2014 Marta Tiago Nunes Santos. “Utilização de copépodes preservados como alimento no cultivo de larvas de dourada (*Sparus aurata*, Linnaeus, 1758) e de juvenis de linguado (*Solea senegalensis*, Kaup, 1858): Impacto no crescimento e qualidade dos organismos” Dissertação (Aquacultura e Pescas, especialização em Aquacultura). Universidade do Algarve. Jury: Karim Erzini, Paulo J. Gavaia, Claudia Aragão, Laura Ribeiro.

2015 Tamara Filipa da Costa Santos “Incorporation of selenium on microalgae as supplement to artemia and zebrafish”. Dissertação (Aquacultura e Pescas, especialização em Aquacultura). Universidade do Algarve. Jury: Elsa Cabrita, Paulo J. Gavaia, João Varela, Luisa Barreira.

2016 Mariana Cabral Monteiro Matos dos Santos “Characterization of microRNAs expression in the skeletal development of Zebrafish”. Master in Marine Biology, Universidade do Algarve. Jury: João Varela, Pedro Guerreiro, Paulo Gavaia

2019 Catarina Baptista Ribeiro “Improvement of Gracilaria sp. efficiency as ingredient in European seabass diets”. Master in Marine Biology, Universidade do Algarve. Jury: Rita Castilho, Paulo Gavaia, Sónia Batista

2020 Mattew Bernt Castaldi “Development of a commercial microalgae enrichment of live feed for zebrafish”. Master in Aquaculture and Fisheries, Universidade do Algarve. Jury: Margarida Castro, João Navalho, Paulo Gavaia

2021 Daniela tomás de Castro “Development of a commercial microalgae enrichment for optimizing zebrafish reproduction” Master in Aquaculture and Fisheries, University of Algarve. Jury: Margarida Castro, Ana Teresa Gonçalves, Paulo Gavaia

2021 Inês Sá da Costa Pereira Borges “Caracterização de duas linhas de peixe-zebra mutantes para a elastina no estudo da síndrome de Keutel” Master in Biomedical Sciences. University of Algarve. Jury: Anabela Bensimon-Brito, Clévio Nobrega, Paulo Gavaia

2022 Nicoleta Cristafovici “The role of vitamin K in osteoporosis”. Integrated Master in Pharmaceutical Sciences. University of Algarve. Jury: Isabel Maria Ramalhinho, Dina Simes, Carla São Bento Viegas, Paulo J. Gavaia

BSc

2007 Paulo Dias. “Clonagem do Colagénio de esturjão (*Ascispenser sp.*)”. Dissertação (Bioquímica). Dissertação (Licenciatura em Bioquímica) - Universidade do Algarve. Jury: Paulo J. Gavaia, Leonor Cancela, Carla S.B. Viegas.

2007 Cindy Vitória Fazenda. “Regulação da expressão genética dos promotores do gene da MGP de *X. laevis* pelo Runx2”. Dissertação (Licenciatura em Bioquímica) - Universidade do Algarve. Jury: Paulo J. Gavaia, Leonor Cancela, Natercia Conceição.

2016 Brunelly Cavalcante Rodrigues. “Osteoartrose pós-traumática. Haverá lugar para a identificação de biomarcadores?” Dissertação (Licenciatura em Ciências Biomédicas) - Universidade do Algarve. Jury: Paulo J. Gavaia, Inês Araujo

2016 Marina Catunda Baessa. “In vitro antioxidant and enzyme inhibitory properties of medicinal plants from Pakistan: new sources of natural products for public health problems”. Dissertação (Licenciatura em Ciências Biomédicas) - Universidade do Algarve. Jury: Paulo J. Gavaia, Inês Araujo

2016 Marta Isabel Seita Afonso. “Maternal thyroid hormones as determinant factors in zebrafish neural embryonic development”. Dissertação (Licenciatura em Ciências Biomédicas) - Universidade do Algarve. Jury: Paulo J. Gavaia, Inês Araujo

2016 Alexandre da Cruz Batalha. “Regulatory Mechanisms of Biomineralization in Marine Bivalves”. Dissertação (Licenciatura em Ciências Biomédicas) - Universidade do Algarve. Jury: Paulo J. Gavaia, Inês Araujo

2017 Mafalda Rodrigues Pereira “Identification of maternal thyroid hormones (MTH)-dependent cells regulating blood-brain-barrier development (BBB) in zebrafish”. Dissertação (Licenciatura em Ciências Biomédicas) - Universidade do Algarve. Jury: Paulo J. Gavaia, Natércia Conceição

2017 Inês Graça Raposo “Study of the ear regeneration capacity of Spiny mice species”. Dissertação (Licenciatura em Ciências Biomédicas) - Universidade do Algarve. Jury: Paulo J. Gavaia, Natércia Conceição

2019 Andreia Pimpão Afonso “ABC da Investigação na área de Biologia do Desenvolvimento do Peixe-Zebra: explorar os mecanismos envolvidos na plasticidade morfogenética de estruturas de vertebrados” Dissertação (Licenciatura em Ciências Biomédicas) - Universidade do Algarve. Jury: Paulo J. Gavaia, Clévio Nóbrega, Inês Araújo.

2019 Catarina Garrido Antunes “Estudo da estrutura e função da tirosinase e o seu papel no albinismo num modelo de peixe” Dissertação (Licenciatura em Ciências Biomédicas) - Universidade do Algarve. Jury: Paulo J. Gavaia, Clévio Nóbrega, Inês Araújo.

2019 Marta Raquel Lima Ferreira “Dimensões do palato e a sua correlação com a estatura no contexto de identificação forense” Dissertação (Licenciatura em Ciências Biomédicas) - Universidade do Algarve. Jury: Paulo J. Gavaia, Clévio Nóbrega, Inês Araújo.

2019 Rafaela Flauzino Silvestre “Estudo do efeito de variáveis (pH, polímeros, etc) na preparação de nanopartículas de fucoidan/quitosano”. Dissertação (Licenciatura em Ciências Biomédicas) - Universidade do Algarve. Jury: Paulo J. Gavaia, Clévio Nóbrega, Teresa Neves.

2020 Mariana Pinto Rodrigues Soares Grenhas “Conservation of core features of RANKL throughout vertebrate evolution”. Dissertação (Licenciatura em Ciências Biomédicas) - Universidade do Algarve. Jury: Paulo J. Gavaia, Clévio Nóbrega, Marta Vitorino.

Research Projects

Coordination

POCI-01-0247-FEDER-047200 MaremPó: A água de salmoura como fonte sustentável de compostos para o desenvolvimento de produtos comerciais para aquacultura. **Funding entity:** cofinanciado por COMPETE2020, CRESC Algarve 2020, PT2020 e FEDER. **Duration-** 01/01/21 to 30/06/23. **Budget-** 676.897,98 € (UALG - 110 375,93 €). **Research team:** *Coordinators:* João Navalho & P.J. Gavaia. *Members:* Manuel A. Coimbra, Eduarda Pereira, Ricardo Calado, Cláudia Nunes, Manuel Vilanova, Paula Silva, Alexandre Rodrigues, Victoria de Pino, Inês Póvoa, Teresa Lamela, Célia Cristo, Paulo Martins, Yago del Valle-Inclan, Leonor Cancela, Natércia Conceição, João Quintela. *Participant institutions:* Necton, U. Algarve, U. Aveiro, U. Porto.

31/SI/2017/39896 ZEBRABLOOM: Desenvolvimento de produtos comerciais formulados com microalgas para o enriquecimento de presas vivas de peixe-zebra. **Funding entity:** Agencia Nacional de inovação -Programa Operacional CRESC Algarve 2020. **Duration-** 01/2020 to 12/2022. **Budget-** 472.533,22 € (UALG - 326.170,38 €). **Research team:** *Coordinators:* João Navalho & P.J. Gavaia. *Members:* Hugo Pereira, João Varela, Alexandre Rodrigues, Victoria de Pino, Leonor Cancela, Ricardo Afonso, Isabel Palmeirim, Luisa Barreira, M^a João Cruz. *Participant institutions:* Necton, U. Algarve.

Marie Skłodowska-Curie Actions (MSCA) Innovative Training Network (ITN) programme H2020-MSCA-ITN-2017 n. 766347 (BioMedAQU): Aquaculture meets Biomedicine: Innovation in Skeletal Health research". **Funding entity:** European commission. **Duration-** 08/2018 to 07/2022. **Budget-** 3.745,860.48 € (UALG - 476.712,72 €). **Research team:** *Coordinators:* L. Cancela & P.J. Gavaia. *Participant institutions:* U. Algarve, U. Liège, U. tor Vergata, U. Las Palmas de Gran Canária, U. Gent, U. Münster, Isnt. Português do Mar e Atmosfera, U. Politecnica del Marche, INSERM.

16-02-01-FMP-0058 (ALGASOLE) Title: Desenvolvimento e implementação de alimentos suplementados em macroalgas ricas em vitamina K no cultivo de linguado (*Solea senegalensis*). **Funding entity:** FEAMP, Programa Mar 2020. **Duration-** 11/2017 to 06/2021. **Budget-** 427.275,81€. **Research team:** *Coordinator:* P.J. Gavaia; *Members:* Leonor Cancela, Natércia Conceição, Elsa Cabrita, Rui O. Santos, Graça Miguel, João Reis, João Silva, Margarida Reis, Ignacio Fernández, Vânia Roberto, Ricardo Afonso. *Participant institutions:* UALG / CCMAR.

33/SI/2015 (17925 LARVAMIX) Title: Desenvolvimento de uma prémistura de micronutrientes para optimizar as dietas para larvas de peixes marinhos. **Funding entity:** Programa Operacional CRESC Algarve 2020. **Duration-** 04/2016 to 03/2019. **Budget-** 119.905,21 € **Research team:** *Coordinator:* P.J. Gavaia; *Members:* Leonor Cancela, Natércia Conceição, Gil Martins. **Research consortium:** UALG / CCMAR; SPAROS Lda.; INVIVONSA Portugal S.A.; IPMA; Inst. Sci. Biom. Abel Salazar.

31-03-05-FEP-0073 (KLING) Title: Estudo piloto para melhoramento do status nutricional em vitamina K: optimização da reprodução e demonstração da melhoria na qualidade larvar de linguado. **Funding entity:** Programa Operacional Pesca 2007-2013 (PROMAR) Apoio a Projetos Piloto e Transformação de Embarcações de Pesca **Duration-** 11/2014 – 12/2015. **Budget-** 164.414,6 €. **Research team:** *Coordinator:* P.J. Gavaia. *Participant institutions:* UALG / CCMAR.

PTDC/MAR/105152/2008 (SPECIAL K) Title: Effects of dietary vitamin K supplementation on growth and skeletal development of teleost fish **Funding entity:** Fundação para a Ciencia e a Tecnologia. **Duration-** 02/2010-06/2013. **Budget-** 195.107 €. **Research team:** *Coordinator:* P.J. Gavaia. *Participant institutions:* CCMAR.

POCI/MAR/60883/2004 (XENOFISH) Title: Effects of xenobiotics in skeleton development and fin regeneration in fish. **Funding entity:** Fundação para a Ciencia e a Tecnologia. **Duration-** 01/2006-12/2008. **Budget-** 84.552 €. **Research team:** *Coordinator:* P.J. Gavaia. *Participant institutions:* CCMAR/UALG, CSIC-Cadiz, Spain.

Participation

ALG-01-0247-FEDER-069961 Performalgae - Estabelecimento de culturas industriais de microalgas de alto desempenho para a produção de bioestimulantes e alimentos funcionais. **Funding entity:** COMPETE 2020, CRESC Algarve 2020, Portugal 2020. **Duration-** 2020/01/01 -2023/06/30 **Budget-** 644.870 €; (134 340 € BioSkel). **Coordinator:** Joana Silva, Helena Cardoso **Members:** P.J. Gavaia, V. Laizé, L. Cancela, H. Pereira, J. Varela, L. Maylin, P. Schulze, L. Speranza, L. Barreira, P.J. Correia, P. Cunha, M. Reis, A. Gonçalves, F. Gama, **Participant institutions:** AllMicroalgae, UALG, Green CoLab

PTDC/CVT-CVT/4109/2020 SPERMANTIOX- New approaches on the antioxidant diet-effect in fish sperm traits: the role of sperm microRNAs on transgenerational transmission **Funding entity:** FCT IC&DT Projects 2020 **Duration-** 2021/01/01 -2023/12/31 **Budget-** 249.870 €; (25000 € BioSkel). **Coordinator:** Elsa Cabrita **Members:** P.J. Gavaia, Elvira Fatsini, Catarina Oliveira. **Participant institutions:** Centro de Ciências do Mar

EJPRD/0004/2020 PhysPath-KS - Understanding the pathophysiology of Keutel Syndrome: A path towards cure. **Funding entity:** Fundação para a Ciência e a Tecnologia. **Duration-** 2020/04/01 -2023/03/31. **Budget-** 1 015 157,43 €; (326 638,70 € UALG) **Coordinator:** M.L. Cancela **Members:** N. Conceição, P.J. Gavaia, V. Laizé. **Participant institutions:** Centro de Ciências do Mar

ES610802 (AquaMyc) Title: Tolerance of Atlantic salmon to novel feed mycotoxins- Implications on fish performance and nutrient interactions. **Funding entity:** NRC - Norwegian Research Council. **Duration-** 01/08/2018 to 30/07/2022. **Budget-** 300.000 NOK. **Research team:** *Coordinator:* Marc Berntssen; *Members at CCMAR:* Vincent Laizé, P.J. Gavaia. **Participant institutions:** Havforskningsinstituttet; NIFES; Gargill; university of California- San Diego, University of Bergen; CCMAR.

16-02-01-FMP-0057 (OSTEOMAR) Title: Novos compostos marinhos como fonte nutricional para uma melhoria da qualidade e bem-estar de peixes em aquacultura. **Funding entity:** FEAMP, Programa Mar 2020. **Duration-** 11/2017 to 10/2020. **Budget-** 269.449,19€. **Research team:** *Coordinator:* Leonor Cancela; *Members:* P.J. Gavaia, Natércia Conceição, Vincent Laizé, João Sofia Engrola, Ignácio Fernández, Gil Martins. **Participant institutions:** UALG / CCMAR.

16-02-01-FMP-0056 (REPROF1) Title: Condicionamento de indivíduos f1 de linguado senegalês com perspetivas à reprodução em cativeiro. **Funding entity:** FEAMP, Programa Mar 2020. **Duration-** 11/2017 to 10/2020. **Budget-** 273.793,96€. **Research team:** *Coordinator:* Elsa Cabrita; *Members:* P.J. Gavaia, Natércia Conceição, Vincent Laizé, Leonor Cancela, João Reis. **Participant institutions:** UALG / CCMAR.

16-02-01-FMP-0055 (SERINOVA) Title: Bases para a implementação de uma nova espécie na aquacultura em Portugal. **Funding entity:** FEAMP, Programa Mar 2020. **Duration-** 11/2017 to 10/2020. **Budget-** 426.434,56€. **Research team:** *Coordinator:* Elsa Cabrita; *Members:* P.J. Gavaia, Natércia Conceição, Leonor Cancela, João Reis, João Quintela, Carlos Andrade. **Participant institutions:** UALG / CCMAR.

055 ALGARED + 5E (ALGARED+) Title: RED transfronteriza para el desarrollo de productos innovadores con microalgas. **Funding entity:** European Commission (Brussels, Spain) INTERREG – POCTEP. **Duration-** 06/2017 to 12/2019 **Budget-** 2,230,497.14€. **Research team:** *Coordinator:* João Varela; *Members:* P.J. Gavaia, M.L. Cancela, V. Laizé, L. Barreira, E. Cabrita. **Participant institutions:** U. Huelva, UALG, CTAQUA, SEA4US, ICMAN-CSIC, U. Cordoba, Necton, IPMA, IFAPA

H2020-INFRAIA-1-2016-2017 (ASSEMBLE PLUS) Association of European Marine Biological Research Laboratories Expanded - Development of Instrumentation (JRA4). **Duration-** 10/2017 to 9/2021. **Budget:** 440.799,65k€ **Budget CCMAR-** 63.000 €. Lead Partner: Ian Probert - Université Pierre et Marie Curie (UPMC); **Participant institutions:** CCMAR, UPMC

Project QREN 23000 2012 (ZEBRAFEEDS) - Dietas para peixe-zebra: aplicações no sector farmacêutico e da

biomedicina. **Funding entity:** ADI- Fundo Europeu de Desenvolvimento Regional (FEDER), através do Programa Operacional do Algarve (PO Algarve) **Coordinators:** SPAROS; L. Cancela. **Duration:** 01/2012 – 06/2015 **Budget:** 150.945 €. *Participant institutions:* SPAROS Lda; CCMAR/UALG,.

PTDC/MAR/112992/2009 (AQUATOX) - Assessment of mineralogic toxicity of aquatic pollutants. **Funding entity:** Fundação para a Ciência e a Tecnologia **Coordinator:** V Laizé. **Duration:** 07/2011 – 06/2014 **Budget:** 112,945 €

PTDC/MAR/119656/2010 (DEEPBONE) - Bone biology of deep-sea teleost fish. **Funding agency:** Fundação para a Ciência e a Tecnologia. **Coordinator:** V Laizé. **Duration:** 01/2012 – 06/2015. **Budget:** 109,200 €

PTDC/CVT/102481/2008 (ULTRAFISH) - Ultrasound to enhance the nutritional status of eggs and yolk-feeding larvae: a novel nutritional tool to program growth potential and metabolic pathways in juvenile fish. **Funding entity:** FCT Fundação para a Ciência e a Tecnologia **Coordinator:** J. Dias. **Duration:** 02/2010- 01/2013. **Budget:** 189.745 Euro

PTDC/MAR/70855/2006 (FATTYBONE) - Dietary fatty acids as modulators of bone metabolism in gilthead sea bream (*Sparus aurata*). **Funding entity:** FCT Fundação para a Ciência e a Tecnologia. **Coordinator:** J. Dias. **Duration:** 08/2008 - 07/2011. **Budget:** 191.453 Euro

PTDC/MAR/105313/2008 (FishCell) - Development and characterization of zebrafish stem cells: implications for transgenesis. **Funding entity:** FCT Fundação para a Ciência e a Tecnologia. **Coordinator:** V Parameswaran. **Duration:** 01/2010 – 12/2012 **Budget:** 170.267 Euro

PTDC/MAR/71685/2006 (HYDRAA) - Improved dietary nitrogen formulations for marine fish larvae: effects on growth performance and skeletal formation **Funding entity:** FCT Fundação para a Ciência e a Tecnologia **Duration:** 08/2008 - 07/2011. **Budget:** 190.802 Euro

FP6-2005-SSP5A (SEACASE) - Title: “Sustainable extensive and semi-intensive coastal aquaculture in Southern Europe”. **Funding entity:** Comissão Europeia FP7. **Duration-** 1/2007- 12/2009 **Research team:** *Coordinator:* MT Dinis. *Participant institutions:* CCMAR, INIAP-IPIMAR-Portugal, CSIC- Spain, IFREMER, FMA, UBO-CEDEM - France, ICRAM, UTV, UPD – Italy, HCMR, UoC- Greece, AÇO-Egipt. **Budget:** 1.556.691Euro

INTERREG IIIA- (SP5.P117/03) (PROMAR) - Title: “Cooperación Algarve-Andalucía para la Promoción de recursos acuícolas marinos en el litoral suratlántico. Promoting aquaculture marin resources in Southern Atlantic litoral” **Duration-** 1/2006- 12/2007 **Funding entity:** INTERREG III- FEDER. **Research team:** *Coordinator:* MT Dinis. *Participant institutions:* CCMAR, IPIMAR, Spain **Budget:** 400,000 Euro

POCTI/MAR/61623/2004 (SAARGO) - Title: Dietary amino acids and skeletal development in white bream (*Diplodus spp.*) **Duration-** 11/2005-10/2008 **Funding entity:** FCT Fundação para a Ciência e a Tecnologia. **Duration:** 11/2005 – 10/2008 **Research Team:** L. Conceição, P. Gavaia, D. Simes, P. Rodrigues (CCMAR); P. Pousão, M. Saavedra (IPIMAR) **Budget:** 86,373 € (funding for CCMAR: 55,404 €)

MCYT/AGL2003-03558 (SPARUGENES) - Title: Skeletal development, alterations and malformations during larval ontogeny of species with interest for aquaculture. Molecular, cellular and biochemical approaches. Ministerio de Ciencia y Tecnología (MCYT) Spain. **Duration-** 12/2003-11/2006. **Research Team:** Carmen Sarasquete, Juan Bosco, L. Cancela, P. Gavaia, C. Viegas **Budget-** 150.000€ (funding for CCMAR: 20,000€)

POCTI/CVT/42098/2001 (FISHDEV) - Title: Mineralization processes in marine and fresh water teleosts: function of Gla proteins (Matrix Gla and osteocalcin). Fundação para a Ciência e a Tecnologia. **Duration-** 06/2003-05/2006. **Research Team:** L. Cancela, P. Gavaia, D. Simes, J. Pinto, C. Viegas **Budget-** 65.000€

PRAXIS/C/BIA/11159/98: “Função das proteínas Bone Gla e matrix Gla em peixes: estudos sobre a mineralização da matriz extracelular do osso, cartilagem e tecidos não calcificados”. **Duration-** 7/1999-10/2001.

PRAXIS 2/2.1/BIA/469/94: “Caracterização da expressão genética das proteínas Matrix Gla e Bone gla em fases específicas do desenvolvimento embrionário e larvar da dourada *Sparus aurata*”. **Duration-** 11/1996-5/2000.

NATO SA.5-2-05 (CRG.94075): “Cloning of Matrix Gla Protein (MGP) from *Xenopus laevis*: Tissue distribution and developmental appearance”. **Duration-** 08/1997-02/2001.

AIR3.CT94.2487: “Development of mussel-specific expression vectors suitable for transgenic organisms: implications on the establishment of mollusk continuous cell lines”. **Duration-** 2/1995-1/1998

Scientific advisor

CONICYT VCE 6000015- Calidad de gametos y malformaciones embrionarias en salmonidos de la Araucanía: Problemas y desafíos. Scientific advisor: Red de investigación para el estudio de la pérdida de calidad de gametos en salmonidos producidos en la Región de la Araucanía y la formulación de las estrategias para su estudio y mitigación que den sustentabilidad a la industria. Leading Partner: Catholic Univ. of Temuco, Chile. 2017. **Duration-** 12/2016-12/2017

Networks

Marine Genomics Europe - Implementation of high-throughput genomic approaches to investigate the functioning of marine ecosystems and the biology of marine organisms. Reference and funding entity: NoE sixth framework programme - contract n° 505403 Duration: 1/3/2004 – 28/02/2008.

Research team: Adelino Canário, M. Leonor Cancela, Ester Serrão, Gareth Pearson, Deborah Power, Vincent Laizé, João Cardoso e outros. Total budget: 10,000,000 €; Funding for CCMAR: 100 000 €. URL: <http://www.marine-genomics-europe>

Research Platform On Bone Growth And Disorders In Atlantic Salmon- PI: Tom Hansen Institute of Marine Research (IMR), NORWAY

COST ACTION B23. Oral facial development and regeneration. Finished 2008

COST ACTION FA0801 (LARVANET) – Critical success factors for fish larval production in European Aquaculture: a multidisciplinary network” (07/2008- 06-2014)

COST ACTION FA1205 (AQUAGAMETE)- Assessing and improving the quality of aquatic animal gametes to enhance aquatic resources- The need to harmonize and standardize evolving methodologies, and improve transfer from academia to industry (2011- ongoing)

COST ACTION FA1304 (FITFISH)- Swimming of fish and implications for migration and aquaculture. (2011- ongoing)

Projects for implementation and development of scientific collaborations

AI-E-423/02 ICCTI-CSIC 2002/2003. Tissue distribution, developmental appearance and regulation of expression of bone Gla protein in fish: comparison between marine and freshwater fishes **ICCTI-CSIC 2000/2001**_Acções Luso-Espanholas with ICMAN-CSIC, Cadiz, Spain. (2,000 €)

CRUP/Treaty of Windsor 2004/2005 with the University of Bath, UK. (2,000 €)

CRUP/Treaty of Windsor 2006/2008 with the University of Bath, UK. (2,000 €)

GRICES/EGIDE-Programa Pessoa Acções Integradas De Cooperação Científica E Técnica Luso-Francêsas Programa 2007/2008 with the IFREMER – “Bone Biology of deep-sea fish DEEPBONE” (3,000 €) (collaboration with Sarrazin J, Ifremer, France)

AI-E-54/11 Title: Efeito da suplementação nutricional em vitaminas A e K em conjunto com ácidos gordos altamente insaturados no desenvolvimento e fisiologia esquelética de vertebrados marinhos: estudos comparativos in vitro e in vivo. Funding agency: Conselho de Reitores das Universidades Portuguesas (CRUP) Coordinator: ML Cancela Duration: 2011 - 2012 Budget: 2,500 €

Participating institutions: CCMAR / University of Algarve, Portugal; IRTA-SCR, Spain

Industrial Contracts

Lucta S.A. 2021 Testing of dietary formulations on zebrafish larval growth (13,853€)

Rota Grega 2020 Avaliação radiográfica de malformações esqueléticas em peixes (96.7€)

Rota Grega 2020 Avaliação radiográfica de malformações esqueléticas em peixes (600€)

BioMin (Austria) 2018 Testing of two molecules (mycotoxins) over the survival and growth of zebrafish larvae exposed to mycotoxins until at 10 days post fertilization (dpf) (4,379€)

Algenuity (UK) 2018 (10,700€)

BioMin (Austria) 2017 Effects of mycotoxins in bone formation (2,900€)

Safistela (Portugal) 2015-2016 Otimização de regime de alimentar em larvicultura de linguado (25,100€)

Stolt Sea Farm (Spain) 2015 Nutritional improvements on Senegal sole larval production (10,000 €)

Sparos S.A. (Portugal) 2014 Analysis of gene expression by qPCR (4,126 €)

Stolt Sea Farm (Spain) 2014 Nutritional improvements on Senegal sole larval production (5,910 €)

Technophage S.A. (Portugal) 2014 GoBone2 (4,757.5 €)

Nireus Aquaculture S.A. (Greece) 2013 Calcium and phosphorus content in fish feed and bone vertebrae, and histological analysis of fish intestine (2,500 €)

Technophage S.A. (Portugal) 2013 GoBone1 (7,465 €)

Sparos S.A. (Portugal) 2011 Evaluation of skeletal quality in Gilthead seabream larvae, reared with SPAROS diets (1,000 €)

EWOS (Norway) 2005 Evaluation of the quality of the skeleton in gilthead seabream (1,500 €)

Organization of Meetings and Symposia

Cancela ML, Gavaia PJ, Bensimon-Brito A, Leite R, Laizé V, Witten PE (2009) International Workshop on Interdisciplinary Approaches in Fish Skeletal Biology, April 27-29. Tavira, Portugal. Approx. 100 participants from 12 countries.

Cancela ML, Gavaia PJ, Bensimon-Brito A, Leite R, Laizé V, Witten PE (2011). II International Workshop on Interdisciplinary Approaches in Fish Skeletal Biology, April 26-28. Tavira, Portugal. Approx. 100 participants from 14 countries.

Cancela ML, Arraiano C, Marques R, Viegas S, Domingues S, Andrade J, Laizé V, Gavaia PJ, Conceição N, Leite R (2012). FEBS International Workshop on “New Developments in RNA Biology”, Sept 1 - 4 2012 Hotel Albacora-VilaGale, Tavira, Portugal. Approx. 111 participants from 24 countries.

Cancela ML, **Gavaia PJ**, Conceição N, Fernández I, Laizé V, Witten PE (2013). III International Workshop on Interdisciplinary Approaches in Fish Skeletal Biology, April 26-28. Tavira, Portugal.

Cancela ML, **Gavaia PJ**, Conceição N, Fernández I, Laizé V, Witten PE (2015). IV International Workshop on Interdisciplinary Approaches in Fish Skeletal Biology, April 27-30. Tavira, Portugal.

Gavaia PJ, Fernandez I, Roberto V, Cabrita E, Oliveira C (2015). Workshop projecto KLING- Estudo piloto para melhoramento do status nutricional em vitamina K: otimização da reprodução e demonstração da melhoria na qualidade larvar de linguado. December 18, University of Algarve, Faro, Portugal.

Paulo J. Gavaia (2016). Theoretical and practical course “Utilização de peixe zebra como modelo em biomedicina e estudo de patologias humanas”. April 13, 2016. CCMAR. University of Algarve, Faro, Portugal.

Paulo J. Gavaia (2016). Theoretical and practical course “Using zebrafish as a model in biomedicine and for the study of human diseases”. May 12, 2016. CCMAR. University of Algarve, Faro, Portugal.

Paulo J. Gavaia (2017). Theoretical and practical course “Using zebrafish as a model in biomedicine and for the study of human diseases”. April 21, 2017. CCMAR. University of Algarve, Faro, Portugal.

Cancela ML, **Gavaia PJ**, Conceição N, Fernández I, Laizé V, Witten PE (2018). V International Workshop on Interdisciplinary Approaches in Fish Skeletal Biology, April 16-19. Tavira, Portugal.

Rosa J.T., Tarasco M., Roberto V., **Gavaia P.J.**, Cancela M.L., Laizé V. (2021) Training school “Zebrafish tools for the screening of osteogenic compounds”, COST action Ocean4Biotech (C18238), 8-10 September 2021, Faro, Portugal (18 participants from 5 countries) Organizing committee

Gavaia P.J., Cancela M.L., Laizé V., Ribeiro L. (2021) Training school “Using in vitro models in skeletal research”, Marie Skłodowska-Curie ITN BIOMEDAQU, University of Algarve, 24-26 November 2021 (16 participants from 11 countries) Organizing committee

Teaching activity

2006 to present “Sistemas Orgânicos Funcionais 101 – Sistema musculo estquelético”, 1º ciclo Ciências Biomédicas– University of Algarve- Responsável da disciplina desde 2016

2018 to present “Método Científico”. Master in Biomedical Sciences – University of Algarve

2018 to present “Mecanismos de doença”. Master in Biomedical Sciences – University of Algarve

2020 to present “Modelos animais em Investigação Biomédica”. 1º ciclo Ciências Biomédicas– University of Algarve

2006 to 2010 -Técnicas em Biologia Molecular e Celular, Masters in Marine Biology - International Masters in Aquaculture (EBMC) – University of Algarve

2007 to 2011 Biology of Bone and Cartilage Masters in Biomedical Sciences – University of Algarve

2004 – 2007 Cell culture (Biochemistry-histological and microscopic observation), Masters in Molecular Biology and microbiology – University of Algarve

2013 – 2014 Histologia, 1º ciclo Ciências Biomédicas – University of Algarve

Advanced training (teaching)

Paulo J. Gavaia (2010). Ossification and Malformations. LARVITA- Fish Larvae Training School -COST action FA0801. November 22-26. University of Algarve, Faro, Portugal.

Paulo J. Gavaia (2011). Training expert in the “Curso Prático de Utilização de Roedores, Peixes e Anfíbios Em

“Investigação Científica” (Practical Course in the Use of Rodent, Fish, and Amphibian in Scientific Research), held at the University of Algarve, Faro, Portugal, July 7-9, 2011.

Paulo J. Gavaia (2015). Training expert in the “1^a Edição do Curso de Ciências em Animais de Laboratório – Organismos Aquáticos (CAL-AQUA) - Práticas” Teaching in the modules “Aquatic organism necropsy (2,5 horas)” and “Zebrafish reproduction (2,0 horas)”. April 13-15, 2015. University of Algarve, Faro, Portugal

Paulo J. Gavaia (2015). Training expert in the “2^a Edição do Curso de Ciências em Animais de Laboratório – Organismos Aquáticos (CAL-AQUA) - Práticas” Teaching in the modules “Zebrafish Microinjection (5 horas)”. October 26-28, 2015. University of Algarve, Faro, Portugal

Paulo J. Gavaia (2015). Workshop on “Skeletal development of fishes” with 1 hour theoretical and 5 hours practical classes. 33rd Youth Science Meeting. July 26 – August 1, 2015. University of Algarve, Faro, Portugal.

Paulo J. Gavaia (2018). Training expert in the “3^a Edição do Curso de Ciências em Animais de Laboratório – Organismos Aquáticos (CAL-AQUA) - Práticas” Teaching in the modules “Zebrafish Microinjection (5 horas)”. July 2-6, 2018. University of Algarve, Faro, Portugal

Paulo J. Gavaia & Gil Martins (2019). Basis of zebrafish biology and husbandry. Zebrafish Tools for the Screening of Osteogenic Compounds 15-17 July. CCMAR. University of Algarve, Faro, Portugal.

C. Boglione, **P. Gavaia**, P.E. Witten (2019). Practical survey of skeletal anomalies on species used in BioMedaqua activities: seabream, zebrafish, medaka, meagre, salmon. BioMedaqua Summer School no. 2 'Monitoring of Fish Skeletal Anomalies' University of Rome Tor Vergata, 23-25, 30 September. Rome, Italy.

Paulo J. Gavaia (2021) Skeletal biology and metabolism. Zebrafish tools for the screening of osteogenic compounds”, COST action Ocean4Biotech (C18238), 8-10 September, 2021. University of Algarve, Faro, Portugal.

Jury in international contests

2006- Imagene 2nd edition: A Photo Contest on Marine Genomics. Marine Genomis Europe. Jury: Michèle Barbier, Eva Boon, Paulo Gavaia, Virginie Mittard-Runte, Ricardo Leite, Shai Shafir, Ulrika Hjelm, Pascal Bodin, Vincent Derrien, Wilfrid Thomas, Yann Fontana, Marielle Guichoux.

2013- iMed 5.0 - Fundação AstraZeneca Innovate Competition Júri: António Jacinto, Paulo Gavaia,

Reviewer of Research Projects

2014 Evaluator of 4 proposals on COFASP - ERA-NET MariFish - 1st Transnational Call for proposals ERA-NET SEAS-ERA in the role of Independent External Expert (2) and Rapporteur (2)

2016 Evaluator of 2 proposals on COST Open Call OC-2016-1 in the role of Independent External Expert and Rapporteur

COFASP - ERA-NET (2014); Cost Actions (2016; 2018; 2019); UK Space Agency (2018); BIRAX Ageing (2019); Agência Nacional de Inovação (2020); European Science Foundation (2021)

Consultant activity

2009- present- Scientific consultant for SGS ICS in the quality of “expert “ for auditing Oceanarium of Lisbon in the process of renewing NP EN ISO 9001:2000 ; NP EN ISO 14001:2004 ; EMAS

2011- 2015 Consultant in Project DIVERSE (PTDC/MAR/113786/2009) as an expert in bone biology and on the evaluation of skeletal deformities.

Member of editorial team

- Toxics
- Toxics special issue “Zebrafish as a model for toxicological research”
- Animals “Recent advances in zebrafish research”

Reviewer Activity

- Acta Ichthyologica et Piscatoria
- American Journal of Experimental Agriculture
- Aquaculture
- Aquaculture International
- Aquaculture Research
- Biotechnic & Histochemistry
- British Journal of Nutrition
- Comparative Biochemistry and Physiology - Part A
- Diseases of Aquatic Organisms
- Fish and Shellfish Immunology
- Immunologic Research
- International Journal Fisheries and Aquaculture
- International Journal of Marine Research
- Journal of Advances in Biology and Biotechnology
- Journal of Applied Ichthyology
- Journal of Cellular Biochemistry
- Journal of Experimental Research
- Journal of Fish Biology
- Journal of Ichthyological Research
- Journal of the Marine Biological Association of the United Kingdom
- Journal of the World Aquaculture Society
- Jordan Journal of Biological Sciences
- PLOS One
- Scientific Reports
- Reproduction Fertility and Development
- Toxics
- Turkish Journal of Aquaculture

- Zebrafish