



Paulo Jorge Travessa Gavaia

PhD Biological Sciences - Molecular Biology

Curriculum Vitae

September, 2017

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, Department of Biomedical Sciences and Medicine, 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 (PRAXIS XXI/BIC/17159/98) “Tratamentos vitamínicos 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 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

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 “Histofisiologia e Histopatologia de Espécies Marinas de Interes 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 radiologica” Departamento de Protecção e Segurança Radiológica. University of Algarve, April 5-6. Faro, Portugal.
- 1998-** “Ichtiopatologia 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). Ciencias de Animais de Laboratório Curso Teórico online. 12-2012. University of Algarve, Faro Portugal. Approved in December 2012.
- 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: 10.1079/9781780642079.0000

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 L.E.C., 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 research in larval fish physiology and fry production. Springer International Publishing, New York, in press

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: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: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: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: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: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: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 X α 1 gene responsive to Runx2 isoforms Osf2/Cbfa1 and til-1 but not to pebp2 α A2. *Calcified Tissue International* 79: 230-244. doi: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. Higuete, U. Hoge, D. Jollivet, C. LeGall, P. Legendre, D. Leroux, F. Lesongeur, J. Legrand, P. Léon, J.P. Lévêque, I. Martins, H. Ondréas, V. Riou, P. Rodier, E. Sauter, E. Savino, L. Sebastiao, B. Shillito, P. Siméoni, A. Schultz, J.M. Siquin, 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

Steffani 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:10.1016/j.ympev.2007.02.001

Rønnestad 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: 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: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: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: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: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:10.1007/s10695-009-9373-z

Dâmaso-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:10.1007/s10499-009-9296-9

Cunha M.E., Quental -Ferreira H., Boglione C., Palamara E., **Gavaia P.**, Pousão-Ferreira 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: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: 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: 10.1111/j.1439-0426.2012.01986.x

Cardeira J., Bensimon-Brito A., Pousão-Ferreira P., Cancela M. L., **Gavaia P. J.** **2012**. Lordotic-kypnotic vertebrae develop ectopic cartilage-like tissue in Senegalese sole (*Solea senegalensis*). *Journal of Applied Ichthyology* 28: 460–463. doi: 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: 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: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: 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: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: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: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: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: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: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: 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 phyloquinone and warfarin in vitro exposure. *Fish Physiology and Biochemistry*. 41(3): 745-759. doi: <http://dx.doi.org/10.1007/s10695-015-0043-z>

Cardeira J., Mendes A.C., Pousão-Ferreira P., Cancela M.L., **Gavaia P.J.** 2015. Micro-anatomical characterization of vertebral curvatures in Senegalese sole (*Solea senegalensis*). *Journal of Fish Biology* 86 (6): 1796–1810. doi: <http://dx.doi.org/10.1111/jfb.12686>

Diogo P., Martins G., **Gavaia P.J.**, Pinto W., Dias J., Cancela L., Martínez-Páramo S. 2015. Assessment of nutritional supplementation in phospholipids on the reproductive performance of zebrafish (*Danio rerio*). *Journal of Applied Ichthyology* 31: 3-9. doi: <http://dx.doi.org/10.1111/jai.12733>.

Salas-Leiton E., Dias J., **Gavaia P.**, Amoedo A., Valente L.M.P. 2015. Optimization of phosphorus content in high plant protein practical diets for Senegalese sole (*Solea senegalensis*, Kaup 1858) juveniles. Influence on growth performance and composition of whole body and vertebrae. *Aquaculture Nutrition* 23 (1): 18-29. doi: <http://dx.doi.org/10.1111/anu.12354>

Cardeira J., **Gavaia P.J.**, Fernández I., Cengiz I.F., Moreira-Silva J., Oliveira J., Reis R., Cancela M.L., Laizé V. 2016. Quantitative assessment of the regenerative and mineralogenic performances of the zebrafish caudal fin. *Scientific Reports* 6:39191 doi: <http://dx.doi.org/10.1038/srep39191>

Carvalho F.R., Fernandes A.R., Cancela M.L., **Gavaia P.J.** 2017. Improved regeneration and de novo bone formation in a diabetes zebrafish model treated with Paricalcitol and Cinacalcet. *Wound Repair and Regeneration* 86 (6): 1796–1810. doi: <http://dx.doi.org/10.1111/jfb.12686>

Tarasco M., Laizé V., Cardeira J., Cancela M.L., **Gavaia P.J.** 2017 The zebrafish operculum: a powerful system to assess osteogenic bioactivities of molecules with pharmacological and toxicological relevance. *Comparative Biochemistry and Physiology - Part C* 197: 45-52. doi: <http://dx.doi.org/10.1016/j.cbpc.2017.04.006>

Marques C., Roberto V.P., Granadeiro L., Trindade L., **Gavaia P.J.**, Laizé V., Cancela M.L., Fernandez I. 2017. The xenobiotic sensor PXR in a marine flatfish species (*Solea senegalensis*): gene expression patterns and its regulation under different physiological conditions. *Marine Environmental Research* 130: 187-199. Doi: <http://dx.doi.org/10.1016/j.marenvres.2017.07.021>

Riesco M.F., Oliveira C, Soares F., **Gavaia P.J.**, Dinis M.T., Cabrita E. **2017**. Transcript alteration in *Solea senegalensis* sperm after cryopreservation has direct implications in cell status. Accepted to PlosOne

Cardeira J., Laizé V., Martins G., Cancela M.L, **Gavaia P.J.** **2017**. An overview on the teleost bone mechanophysiology. Accepted to Journal of Applied Ichthyology

Roberto V.P., Martins G., Pereira A., Rodrigues S., Grenha A., Pinto W., Cancela M.L., Dias J., **Gavaia P.J.** **2017**. Insights from dietary supplementation with Zinc and Strontium on the skeleton of zebrafish (*Danio rerio*) larvae: from morphological analysis to osteogenic markers. Accepted to Journal of Applied Ichthyology

Fazenda C., Martins G., **Gavaia, P.J.**, Cancela M.L., Conceição N. **2017**. Generation of zebrafish transgenic lines overexpressing a heat-shock mediated Gla-rich protein. Accepted to Journal of Applied Ichthyology

Carvalho F.R., Calado S.M., Silva G.A., Diogo G.S., Moreira da Silva J., Reis R.L., Cancela M.L., **Gavaia P.J.** **2017**. Altered bone microarchitecture in the type 1 diabetes mouse model Ins2Akita. Accepted to Journal of Cellular Physiology

Fernández-Monzón I., **Gavaia P.J.**, Laizé V., Cancela M.L. **2017**. Fish as a model to assess chemical toxicity in bone. Accepted to Archives of Toxicology

Gonçalves R.A., Tarasco M., Schatzmayr D., **Gavaia P.** **2017**. Preliminary evaluation of moniliformin potential risk for teleosts fish species. Submitted to Mycotoxin Research

Simão M., **Gavaia P.J.**, Porto G., Pinto I.J., Hang-Korng E., Cancela, M.L. **2017**. Iron overload induces an osteoarthritis related molecular phenotype in Hfe-KO mouse chondrocytes. Submitted to BioMetals

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Rønnestad I., **Gavaia P.**, Viegas C., Verri T., Cancela M.L.. **2006**. PepT1 in a coldwater marine teleost larvae- Atlantic cod: cloning and preliminary studies of expression and phylogeny. Acta Bio Medica 77: 82

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Communications- Congresses and Scientific Meetings

Oral Communications by Invitation

1. **Paulo J. Gavaia** and Maria Leonor Cancela **2001**. Alteraciones durante el desarrollo larvario em peces: Técnicas moleculares e histológicas. VIII Curso de Patología Y Ecotoxicología Marina. Instituto de Ciências Marinas de Andaluzia - CSIC, April 2-7, Cadiz, Spain.
2. **Paulo J. Gavaia**, C.A. Viegas, Carmen Sarasquete and M. Leonor Cancela **2001**. Detection and localization of osteocalcin (BGP or Bone Gla Protein) in teleosts by in situ hybridation and immunocitochemistry. Sesión Iberio-Americana de Investigadores- Reunión conjunta SIBOMM/SEIOMM. June 7. Madrid, Spain.
3. **Paulo J. Gavaia** and Maria Leonor Cancela **2002**. Alteraciones osteológicas en peces. Curso de Patología Y Ecotoxicología Marina. Instituto de Ciências Marinas de Andaluzia - CSIC, April 1-5. Cadiz, Spain.
4. **Paulo J. Gavaia**, Teresa Dinis, Leonor Cancela **2003**. Desarrollo ontogénico e alteraciones esqueléticas en peces. Implicación de factores nutricionales. VIII Curso de Avances en Acuicultura y Calidad Ambiental. Instituto de Ciências Marinas de Andaluzia -CSIC December 2-5. Cadiz, Spain.
5. **Paulo J. Gavaia** and Leonor Cancela **2004**. Avances en Técnicas Moleculares- Aplicación a Proteínas Esqueléticas de Peces. IX Curso de Avances en Acuicultura y Calidad Ambiental. Instituto de Ciências Marinas de Andaluzia -CSIC October 25-29. Cadiz, Spain.
6. Conceição N., J. Fidalgo, **P.J.Gavaia**, A. C. Silva, J. Belo & M.L. Cancela **2004**. "Regulation of matrix gla protein gene expression: identification of alternative promoter usage during early development." XXXI Jornadas Portuguesas de Genética, ITQB/Oeiras, 5-6 de Fevereiro de 2004
7. **Paulo J. Gavaia** **2005**. Problemas no desenvolvimento ósseo em peixes: métodos de diagnóstico e aplicações. IX Encontro Nacional de Estudantes de Biologia. Universidade do Algarve, March 18-21, Faro, Portugal.
8. **Paulo J. Gavaia** and Leonor Cancela **2006**. Perspectivas en Citogenética y Biología Molecular: Biotecnologías en Acuicultura. XI Curso de Avances en Acuicultura y Calidad Ambiental. Instituto de Ciências Marinas de Andaluzia –CSIC. November 29 -December 1. Cadiz, Spain.
9. **Paulo J. Gavaia** **2006**. Expression of Gla proteins during fish skeletal development. September 20, Center of Marine Biotechnology, Baltimore, USA.
10. **Paulo J. Gavaia** and Leonor Cancela **2008**. Fish As A Model Organism To Study Skeletal Development And Associated Pathologies. XXXVII Annual Meeting of the Brazilian Society for Biochemistry and Molecular Biology (SBBq) -XI Congress of the Panamerican Association for Biochemistry and Molecular Biology (PABMB). Águas de Lindóia May 17 to 20, São Paulo, Brazil.
11. Conceição, L.E.C., Aragão, C., Richard, N., Engrola, S., **Gavaia, P.J.**, Mira, S. and Dias, J. **2009**. Avanços recentes em nutrição de larvas de peixes. 44th Annual meeting of the Sociedade Brasileira de Zootecnia, July 14-17, Maringá, Paraná, Brasil.
12. L. Conceição, D. Alves Martins, S. Engrola, **P. Gavaia**, N. Richard, C. Aragão **2011**. Nutrição, qualidade e performance em larvas de peixes marinhos. AquaNutri – 4^o Simpósio Internacional de Nutrição e Saúde de Peixes, 23-25 November, UNESP, Fazenda experimental Lageado, Botucatu - São Paulo, Brasil
13. Conceição L.E.C., Aragão C., Richard, N., Engrola, S., **Gavaia P.**, Pinto W., Dias, J. **2012**. Novel methodologies in marine fish larval nutrition and production. Workshop on “Innovations in Aquaculture”. May 9, Izmir, Turkey.

14. Ignacio Fernández and **Paulo Gavaia 2015**. Vitamin K, much more than blood clotting: Roles, metabolism and specific requirements. XII Simposio Internacional de Nutrición Acuicola. November 11-13, Hermosillo - Sonora – México.
15. **Paulo Gavaia 2017**. Malformaciones embrionarias en peces: causas que las producen. Seminario Internacional “Calidad de gametos y malformaciones embrionarias en salmónidos de la Araucanía: problemas y desafíos”. Escuela de Acuicultura de la Universidad Católica de Temuco, 21 July. Temuco, Chile.
16. **Paulo Gavaia 2017**. Malformaciones embrionarias en peces: Métodos de evaluación y estrategias de control. Seminario Internacional “Calidad de gametos y malformaciones embrionarias en salmónidos de la Araucanía: problemas y desafíos”. Escuela de Acuicultura de la Universidad Católica de Temuco, 21 July. Temuco, Chile.

Oral Communications

1. E. Lopes, **P.J. Gavaia**, M. Ohresser, M. Leonor Cancela **1997**. Expression of Lac Z reporter gene under the control of an insect-derived actin promoter in larvae and primary cell cultures of oyster (*Crassostrea gigas*). 3rd International Symposium on Research for Aquaculture Fundamental and Applied Aspects. University of Barcelona. August 24-27, Barcelona, Espanha.
2. **P.J. Gavaia**, M. Teresa Dinis, M. Leonor Cancela **2000**. Skeletal development as an assessment criteria for larval *Solea senegalensis* (Kaup) quality. AQUA 2000 - Responsible Aquaculture in the New Millennium .The Acropolis Convention Centre. May 2-6, Nice, France.
3. **P.J. Gavaia 2003**. Técnicas de inmunohistoquímica e hibridación in situ de aplicación en acuicultura. VIII Curso de Avances en Acuicultura y Calidad Ambiental. Instituto de Ciências Marinas de Andaluzia -CSIC December 2-5. Cadiz, Spain.
4. **P.J. Gavaia 2004**. Aplicación de técnicas bioquímicas y moleculares en acuicultura y ecotoxicología. IX Curso de Avances en Acuicultura y Calidad Ambiental. Instituto de Ciências Marinas de Andaluzia - CSIC October 25-29. Cadiz, Espanha.
5. M.L. Cancela, V. Laizé, D.C. Simes, **P.J. Gavaia**, N. Conceição, C. S. B. Viegas, A. R. Pombinho, S. M. P. Marques, J. Fidalgo, D. Braga **2005**. Proteínas gla do osso e cartilagem: importância dos anfíbios e peixes como modelos biológicos para elucidação da sua função e evolução - gla proteins in bone and cartilage: the importance of fish and amphibian models to understand their function and evolution. 1º encontro o Mar e as Ciências da Saúde. April 21. Cooperativa Egas Moniz, Monte da Caparica, Portugal.
6. **P.J. Gavaia** and M.L. Cancela **2006**. Skeletal development and bone-related gene expression in fish larvae. Workshop in Fish Larval Research. University of Algarve, Center of Marine Sciences. January 9, Faro, Portugal.
7. Stefanni, S., Porteiro, F., Bettencourt, R., **Gavaia, P.J.**, Santos, R.S. **2007**. Molecular insights indicate that the bathybenthic genus *Pacycara* (Perciformes: Zoarcidae) is represented by a single species in the North Atlantic hydrothermal vent fields. Evolution 2007. June 16-20, Christchurch Convention Centre, Christchurch, New Zealand.
8. Brito A.B., **P.J. Gavaia**, M.L. Cancela **2007**. Gene expression during regeneration of zebrafish (*danio rerio*) fins: relative expression levels of mineralization-related gla proteins. Meeting of European COST B23 Action "Oral Development and Regeneration", May 30th- June 3rd, Barcelona, Spain

9. **P.J. Gavaia**, A.B. Brito and M. L. Cancela **2007**. Bone related gene expression during dermal bone regeneration in zebrafish (*Danio rerio*). VIII International Symposium On Experimental Techniques. November 2-3, University of Algarve, Faro, Portugal. Experimental pathology and Health Sciences 1: 64-65
10. A.B. Brito, G. Dionísio, **P.J. Gavaia** and M.L. Cancela **2008**. Expression of bone related genes during regeneration of zebrafish (*Danio rerio*) fins. Second Euro Evo Devo meeting, July 29th-August 1st, Ghent, Belgium
11. **Paulo J. Gavaia 2008**. Skeletal evaluation in early stages of *Solea senegalensis*. Workshop - The cultivation of Soles IV. November 11-13, CCMAR, University of Algarve, Faro, Portugal.
12. **Gavaia PJ**, Richard N, Dâmaso L, Dinis MT, Pousão-Ferreira P, Engrola S, Conceição L, Cancela ML **2009**. Skeletal evaluation and technical improvements to decrease the incidence of skeletal deformities in *Solea senegalensis*, Kaup. Interdisciplinary Approaches in Fish Skeletal Biology, April 27-29 Tavira, Portugal.
13. C. Boglione, S. Fontagne, **P. Gavaia**, E. Gisbert, E. Kjorsvik, G. Koumoundouros, M. Moren, K. Moutou, P. E. Witten **2010**. Determinism and causative factors for morphological anomalies in reared European fishes. Aquaculture Europe 2010- Seafarming tomorrow. October 5-8, Porto, Portugal.
14. Jorge Dias, Vera Rodrigues, Rita Colen, Narcisa Bandarra, Leonor Cancela, Vincent Laizé, **Paulo Gavaia 2010**. Effects of dietary lipid sources on bone composition and metabolism in gilthead seabream (*Sparus aurata*) juveniles. Aquaculture Europe 2010- Seafarming tomorrow. October 5-8, Porto, Portugal.
15. Dionísio G., Cancela M.L., **Gavaia P.J. 2010**. Effect of dietary vitamin K supplementation on growth and skeletal development of *Danio rerio*. IMMR 2010-International Meeting on Marine Resources. November 16-17, Peniche, Portugal.
16. **Paulo J. Gavaia 2010**. Ossification and Malformations. LARVITA- Fish Larvae Training School -COST action FA0801. November 22-26. University of Algarve, Faro, Portugal.
17. **P.J. Gavaia**, G. Dionísio, J. Carneira, M.E. Cunha, P. Pousão-Ferreira, L.E.C. Conceição, M.L. Cancela. **2011**. Skeletal quality in Senegalese sole: characterization of fish resulting from environmental and nutritional trials. Workshop - The cultivation of Soles V. 5-7 April 2011, CCMAR, University of Algarve, Faro, Portugal.
18. T. Pacchiarini, E. Cabrita, I. Cross, J.B. Ortiz-Delgado, R. Leite, **P.J. Gavaia**, M.P. Herráez, L. Rebordinos, C. Sarasquete **2011**. Two isoforms of *vasa* maternal factor in Senegalese sole: Biotechnological applications. Workshop - The cultivation of Soles V. 5-7 April 2011, CCMAR, University of Algarve, Faro, Portugal.
19. Jorge Dias, Vera Rodrigues, Rita Colen, Narcisa Bandarra, Joana Rosa, Michael Viegas, Maria Leonor Cancela, **Paulo Gavaia**, Vincent Laizé **2011**. Dietary lipid quality regulates bone composition and metabolism in gilthead seabream (*Sparus aurata*) juveniles. Interdisciplinary Approaches in Fish Skeletal Biology, April 26-28, Tavira, Portugal.
20. Carlos A. P. Andrade, Natacha Nogueira, Paula Silva, Nereida Cordeiro, Maria E. Cunha, Pedro Pousão-Ferreira, Laura Ribeiro, Narcisa Bandarra and **Paulo Gavaia 2011**. Fish larvae quality descriptors: an appraisal of methods for red porgy *Pagrus pagrus* and grouper *Epinephelus marginatus* produced under different rearing conditions. World Aquaculture 2011- Aquaculture for a changing world. June 6-10 2011, Natal convention center. Natal, Brazil.

21. Valente, L.M.P., Campos, C., S. Engrola, **P. Gavaia**, V. Sousa, E. Rocha, L. Conceição, J.M.O Fernandes **2011**. Thermal plasticity of muscle cellularity and gene expression in Senegalese sole (*Solea senegalensis*). 2nd Workshop Meeting of COST Action 925 "The importance of prenatal events for postnatal muscle growth in relation to the quality of muscle based foods". Agroscope Liebefeld posieux research station, Switzerland, 22-23th August.
22. Richard N., Fernández I., Conceição L.E.C., **Gavaia P.J.** **2012**. Effect of dietary vitamin K supplementation on larval proteome and bone marker gene expression in Senegalese sole. XV International Symposium on Fish Nutrition and Feeding. Molde, Norway, 4-7 June 2012.
23. Cancela M.L., Laizé V., Conceição N., Tiago D.M., Maia A.T., Bensimon-Brito A., **Gavaia P.J.** **2012**. Matrix Gla protein expression: a complex process involving the use of alternative promoters, multiple splicing events and microRNAs. FEBS International Workshop on New Developments in RNA Biology, September 1-4, Tavira, Portugal
24. Fernandez I., Gisbert E., Cancela M.L., **Gavaia P.J.** **2012**. Fish skeletal deformities: A major impact on aquaculture with different aetiologies. Aqua 2012, September 1- 5, 2012, Prague, Czech Republic.
25. Fernandez I., Cancela M.L., **Gavaia P.J.** **2012**. Temporal and spatial expression patterns of pregnane X receptor and vitamin K epoxide reductase genes, two core molecular players on fish vitamin K homeostasis and skeletal development. Aqua 2012, September 1- 5, 2012, Prague, Czech Republic.
26. Adrião A., Conceição N., **Gavaia P.**, Grazina M., Cancela M.L. **2012**. Zebrafish as a model to unveil and study skeletal phenotypes related to human MEF2C mutations. XXXVII JPG Congress, 28-30 May, Lisbon, Portugal.
27. Adrião A., Conceição N., **Gavaia P.**, Grazina M., Cancela M.L. **2012**. Case study: MEF2C dependent pathologies. Workshop: Human Genetics-From basic science to clinics and genetic counseling. 26-27 October, University of Algarve, Faro, Portugal.
28. Rocha F., Dias J., Engrola S., **Gavaia P.J.**, Geurden I., Dinis M.T., Panserat S. **2013**. Nutritional programming of carbohydrate-related metabolic pathways in zebrafish (*Danio rerio*). COST Action FA1201 "Epigenetics and Periconception Environment". 23 - 27 April 2013, Antalya, Turkey.
29. Cabrita E., Martínez-Páramo S., **Gavaia P.**, Pacchiarini T., Valcarce D.G., Sarasquete C., Robles V. **2013**. Factors affecting sperm quality and emerging tools for sperm analysis. Larvi 2013- 6th Fish & Shellfish Larviculture Symposium. 2-5 September 2013. Ghent University, Belgium.
30. Fernandez I., Gisbert E., **Gavaia P.J.** **2013**. Vitamin A and K, two fat soluble vitamins required for harmonic fish larval development. Larvi 2013- 6th Fish & Shellfish Larviculture Symposium. 2-5 September 2013. Ghent University, Belgium.
31. Engrola S., Colen R., Rocha F., Barrios C., Conceição L.E., Aragão C., **Gavaia P.J.**, Laizé V., Valente L.M., Dias J. **2014**. Emerging tools for *in ovo* delivery of nutrients and regulatory peptides in fish: effects on larval growth, feed intake and protein metabolism. 16th International Symposium on Fish Nutrition and Feeding (ISFNF XVI). 25–30 May, Cairns Convention Centre, Cairns, Australia.
32. Cardeira J., **Gavaia P.J.**, Cancela M.L., Laizé V. **2015**. How to evaluate the regenerative and mineralogenic performances in the zebrafish caudal fin?. IV Interdisciplinary Approaches in Fish Skeletal Biology, April 27-30, Tavira, Portugal.
33. Fernandez I., Granadeiro L., **Gavaia P.J.**, Laizé V., Cancela M.L. **2015**. Zebrafish as a model for unveiling underlying signaling pathways of warfarin embryopathy. Molecular, Structural & Clinical Aspects of Vitamin K & Vitamin K-Dependent Proteins. July 12 – 17, 2015 Itasca, Chicago, Illinois.

34. Fernández I., Cardeira J., Granadeiro L., **Gavaia P.J.**, Laizé V., Cancela M.L. **2015**. The use of in vivo imaging tools in zebrafish for drug discovery for bone development and homeostasis. XIII congresso SECAL- III Congresso SPCAL, I Congresso Ibérico de Ciências de Animais de Laboratório. November 18-20, Centro de Cirurgia de Mínima Invasión “Jesús Usón”, Cáceres, Spain.
35. Horváth A., Bernáth G., Bokor Z., Kása E., Ósz A., Urbányi B., Cabrita E., **Gavaia P.**, Snoj A., Bravničar N., Jesenšek D. **2015**. Progress towards standardization of cryopreservation methods for salmonid species of the Adriatic drainage basin. The 5th International Workshop on Biology of Fish Gametes. September 7–11 Ancona, Italy.
36. **Gavaia P.J.**, Cardeira J., Cancela M.L. **2015**. Mechano-sensing in the skeleton of teleosts: using model fish to uncover the mechanisms. Aquaculture Europe 2015- Aquaculture, Nature and Society. October 20-23, De Doelen Congress Centre, Rotterdam, Netherlands.
37. **Gavaia P.J.** **2015**. Projeto KLING: Estratégia e Objectivos. 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
38. **Gavaia P.J.**, Roberto V., Calado R., Silva D., Rodrigues V., Serradeiro R. **2016**. Dietary vitamin K supplementation for improving skeletal quality of senegalese. Aquaculture Europe 2016- Aquaculture, Food for Thought. September 20-23, Edinburgh, Scotland.
39. Carson MA, Nelson J, Gilmore B, Rae M, **Gavaia PJ**, Laizé V, Cancela ML, Clarke SA **2017**. Discovering bioactive compounds for bone growth: the osteogenicity of marine organism-derived extracts. 28th Conference of the European Society for Biomaterials, September 4-8, Athens, Greece
40. Diogo P, Martins G, Eufrásio A, Nogueira R, Quinzico I, Silva T, Cabrita E, **Gavaia P** **2017**. Guidelines for zebrafish sperm cryopreservation and storage. 6th International Workshop on the Biology of Fish Gametes September 4-7, 2017, Vodňany, Czech Republic.
41. Fernández I, Roberto VP, Koop M, Cox C, Oliveira C, Fernandez-Riesco M, Fernandes JMO, Cabrita E, **Gavaia P.J.** **2017**. Identification of circulating micro-rnas in fl Senegalese sole with differential reproductive performance. Aquaculture Europe 2017 Cooperation for growth. October 17-20, Dubrovnik, Croatia.

Communications in panel

1. **Gavaia P.J.**, Faustino, M., Cancela M.L. **1996**. Identification of Bone Gla Protein During Early Development of *Solea senegalensis* (KAUP, 1858). X Congresso Nacional de Bioquímica. University of Minho, October 31 - November 2, Braga, Portugal.
2. **Gavaia P.J.** and Cancela M.L. **1997**. Situación presente y perspectivas en acuicultura: Histofisiología, Histopatología y biotoxicología. University of Cádiz, February 17-21 - Puerto Real, Cádiz, Spain.
3. **Gavaia P.J.**, Dinis M.T., Cancela M.L. **1998**. Detection of skeletal abnormalities in hatchery reared *Solea senegalensis* (Kaup, 1858) by a whole mount double staining technique. IV Iberian Congress on Biotechnology, I Ibero-American Meeting on Biotechnology- Biotec'98. University of Minho, July 12-15. Guimarães, Portugal.
4. **Gavaia P.J.**, Dinis M. T., Cancela M. L. **1998**. Pattern of skeletal development in hatchery reared *Solea senegalensis*. VI Seminario de Acuicultura. Escola Superior de Tecnologia e Gestão- IPVC, October 15-16. Viana do Castelo, Portugal.

5. Arellano J.F., Arufe M.I., **Gavaia P.**, Moreno M.J., Sarasquete, C. **2001**. Toxicity of the S-triazine Herbicide Gesatop® to zebrafish larvae (*Danio rerio*). 11th Annual Meeting of SETAC Europe-From basic science to decision-making: The environmental odyssey. May 6-10. Madrid, Spain.
6. **Gavaia P.J.**, Viegas C.A., Sarasquete C., Cancela M.L. **2001**. Detection and localization of osteocalcin (BGP or Bone Gla Protein) in teleosts by *in situ* hybridation and immunocitochemistry. 1st Joint Meeting of the International Bone and Mineral Society and the European Calcified Tissue Society Palacio de Congresos. June 5-10. Madrid, Spain.
7. Simes D.C., **Gavaia P.J.**, Ortiz J.B., Pinto J.P., Cancela M.L. **2001**. Characterization of specific antibodies for fish osteocalcin and its usefulness to investigate osteocalcin tissue distribution in lower vertebrates. 1st Joint Meeting of the International Bone and Mineral Society and the European Calcified Tissue Society, Palacio de Congresos. June 5-10. Madrid, Spain.
8. Pinto J.P., **Gavaia P.J.**, Simes D.C., Kelsh R.N., Cancela M.L. **2001**. Localization of osteocalcin (BGP) during fish (*Sparus aurata*) development by in situ hybridization and immunohistochemistry: comparison between gene expression/protein distribution and skeletal mineralization. 27th meeting of the Federation of European Biochemical Societies (FEBS 2001), June 30 - July 5. Lisbon, Portugal.
9. Pinto J.P., Conceição N., **Gavaia P.J.**, Cancela M.L. **2002**. Co-localization of Matrix Gla protein gene expression and protein accumulation with cartilage distribution in the teleost fish *Sparus aurata*. XIII Congresso Nacional de Bioquímica, Hotel Alfa, December 5-7. Lisbon, Portugal.
10. Leite R.B., **Gavaia P.J.**, Cancela M.L. **2002**. Expression of RNA Helicase dependent protein during the development of oyster larvae. In situ localization, northern analysis of expression and tissue distribution. XIII Congresso Nacional de Bioquímica, Hotel Alfa, December 5-7. Lisbon, Portugal.
11. **Gavaia P.J.**, Simes D.C., Ortiz J.B., Sarasquete M.C., Cancela M.L. **2003**. Simultaneous detection of osteocalcin and matrix gla protein in developmental stages of zebra fish (*Danio rerio*). 30th European Symposium on Calcified Tissues, Palazzo dei Congressi. May 8-12, Rome, Italy.
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100. Martins G., Pinto W., Conceição L., Dias J., **Gavaia P.** **2014**. Effects of experimental dietary formulations on zebrafish growth and skeletal development. EAS 2014 October 14-17, The Kursaal Congress Centre - Donostia-San Sebastián, Spain.
101. Rocha F., Engrola S., Barrios C., Colen R., Aragão C., Castanheira M.F., Martins C., Viegas M., Gavaia P., Laizé V., Dias J. **2014**. Effects of ghrelin fortification of zebrafish eggs on larval growth and feed intake EAS 2014 October 14-17, The Kursaal Congress Centre - Donostia-San Sebastián, Spain.
102. Dias J., Rocha F., Barrios C., Colen R., Sousa V., Valente L.M.P., Viegas M., **Gavaia P.**, Laizé V., Engrola S. **2014**. Follistatin fortification of zebrafish eggs upregulates growth regulatory factors and enhances muscle hyperplasia. EAS 2014 October 14-17, The Kursaal Congress Centre - Donostia-San Sebastián, Spain.
103. Campos LS, **Gavaia PG**, Carrodegus RG, Rosa FP **2014**. Novos biomateriais aloplásticos para regeneração óssea: Um estudo in vivo. XXIII Congresso da Ordem dos Médicos Dentistas, November 6-8, EXPONOR, Matosinhos, Portugal.
104. Carvalho F, **Gavaia PJ**, Cancela ML **2014**. Growth plate changes in a model of diabetes, the Akita mouse, is related to long bone growth retardation. XVIII Meeting of the Portuguese Biochemical Society. December 17-20, Coimbra, Portugal
105. Simão MF, **Gavaia PJ**, Ea HK, Pinto JP, Cancela ML **2014**. Chondrocytes from a hemochromatosis mouse model reveal altered expression of genes associated to iron and cartilage metabolisms. XVIII Congress of the Portuguese Biochemical Society, December 17-20, Coimbra, Portugal

106. Cardeira J, Catela P, Moreira-Silva J, Diogo GS, Reis RL, Martins G, Cancela ML, Laizé V, **Gavaia PJ 2015**. Zebrafish regenerating lepidotrichia are affected by exercise-induced mechanical loading. IV Interdisciplinary Approaches in Fish Skeletal Biology, April 27-30, Tavira, Portugal.
107. Carvalho FR, Fernandes AR, Pimentel A, Neves PL, Cancela ML, **Gavaia PJ 2015** Effect of the vitamin D analogs cinacalcet and paricalcitol in fin regeneration of zebrafish model of diabetes. IV Interdisciplinary Approaches in Fish Skeletal Biology, April 27-30, Tavira, Portugal.
108. Fazenda C, Martins G, **Gavaia PJ**, Cancela ML, Conceição N **2015**. Establishment of transgenic zebrafish lines capable of conditionally inducing expression of Gla-rich protein. IV Interdisciplinary Approaches in Fish Skeletal Biology, April 27-30, Tavira, Portugal.
109. **Gavaia PJ**, Martins G, Livramento M, Laizé V, Pinto W, Cancela ML, Dias J **2015**. Effects of dietary zinc supplementation on zebrafish larvae osteological development. IV Interdisciplinary Approaches in Fish Skeletal Biology, April 27-30, Tavira, Portugal.
110. Granadeiro L, **Gavaia PJ**, Laizé V, Cancela ML, Fernández I **2015**. Zebrafish skeletal development and vitamin K deficiency: a warfarin embryopathy model. IV Interdisciplinary Approaches in Fish Skeletal Biology, April 27-30, Tavira, Portugal.
111. Laizé V, Marques CL, **Gavaia PJ**, Witten PE, Sarrazin J, Pozo M, Moreira-Silva J, Diogo GS, Reis RL, Förlin L, Cancela ML **2015**. Comparative analysis of vertebrae of deep-sea versus surface eelpouts (Zoarcidae). IV Interdisciplinary Approaches in Fish Skeletal Biology, April 27-30, Tavira, Portugal.
112. Marques CL, **Gavaia PJ**, Förlin L, Parkkonen J, Cancela ML, Laizé V **2015**. Osteotoxicity in fish: from seaside to bench. IV Interdisciplinary Approaches in Fish Skeletal Biology, April 27-30, Tavira, Portugal.
113. Martins G, Pinto W, Conceição LEC, Dias J, **Gavaia PJ 2015**. Effects of dietary formulations on zebrafish growth performance and osteological development. IV Interdisciplinary Approaches in Fish Skeletal Biology, April 27-30, Tavira, Portugal.
114. Pereira A, Martins G, Grenha A, Pinto W, Conceição LEC, Dias J, Cancela ML, **Gavaia PJ 2015**. Effects of dietary supplementation with strontium citrate on the osteological development of zebrafish (*Danio rerio*) larvae. IV Interdisciplinary Approaches in Fish Skeletal Biology, April 27-30, Tavira, Portugal.
115. Roberto VP, Mira S, Surget G, Laizé V, **Gavaia PJ**, Le Lann K, Stiger-Pouvreau V, Poupart N, Guérard F, Cancela ML **2015**. Identification of mineralogenic properties of seaweeds and halophytes extracts using zebrafish as model organism. IV Interdisciplinary Approaches in Fish Skeletal Biology, April 27-30, Tavira, Portugal.
116. Santos T, Pereira H, Martins G, Varela J, Barreira L, Dias J, **Gavaia PJ 2015**. Incorporation of selenium in microalgae as supplement to zebrafish. IV Interdisciplinary Approaches in Fish Skeletal Biology, April 27-30, Tavira, Portugal.
117. Conceição N, Fazenda C, Martins G, **Gavaia PJ**, Cancela ML **2015**. Transcriptional regulation and function of gla rich protein gene in zebrafish. 9th European Zebrafish Meeting. 28 June – 2 July, Oslo Congress Centre Oslo, Norway.
118. Pinto W, Martins G, Santos T, Rodrigues V, Riesgo M, Cabrita E, **Gavaia PJ**, Dias J **2015**. Does Size Really Matter? A study focusing on the role of dietary phospholipids on zebrafish reproductive performance. 9th European Zebrafish Meeting. 28 June – 2 July, Oslo Congress Centre Oslo, Norway.

119. **Gavaia PJ**, Pereira A, Grenha A, Martins G, Conceição LEC, Rodrigues S, Pinto W, Cancela ML, Dias J **2015**. Dietary supplementation with strontium citrate positively affects the osteological development of zebrafish (*Danio rerio*) larvae. 9th European Zebrafish Meeting. 28 June – 2 July, Oslo Congress Centre Oslo, Norway.
120. **Gavaia PJ**, Carvalho F, Pimentel A, Neves PL, Cancela ML **2015**. The effects of cinacalcet and paricalcitol in the skeleton of a zebrafish model of diabetes. 9th European Zebrafish Meeting. 28 June – 2 July, Oslo Congress Centre Oslo, Norway.
121. **Gavaia PJ**, Fernandez I, Pimentel A, Neves PL, Cancela ML **2015**. The effects of cinacalcet and paricalcitol in the skeleton of warfarin treated fish. Molecular, Structural & Clinical Aspects of Vitamin K & Vitamin K-Dependent Proteins. July 12 – 17, 2015 Itasca, Chicago, Illinois.
122. Asturiano JF, Riesco MF, Martins G, Vílchez MC, Pérez L, **Gavaia PJ**, Cabrita E **2015**. Cryopreservation of zebrafish sperm, first trials and results. The 5th International Workshop on Biology of Fish Gametes. September 7– 11 Ancona, Italy.
123. Barata M, Azeredo F, Lourenço T, Pousão-Ferreira P, **Gavaia PJ** **2015**. Avaliação radiográfica de deformações esqueléticas em peixes de aquacultura: uma comparação com o método de selecção visual. I Congresso Ibérico de Aquacultura, October 13-16, Casa Colón, Huelva Spain.
124. Barata M, Castanho S, **Gavaia PJ**, Mendes AC, Pousão-Ferreira P, Ribeiro L **2015**. Impacto da alimentação larvar na fase adulta da corvina (*Argyrosomus regius*): Caracterização do esqueleto. I Congresso Ibérico de Aquacultura, October 13-16, Casa Colón, Huelva Spain.
125. Tarasco M, Laizé V, Cardeira J, Cancela ML, **Gavaia PJ** **2016**. Screening methodology to discover novel molecules with osteogenic/anti-osteoporotic properties using zebrafish. 1st CEDOC Symposium on Chronic diseases, June 30-July 01, Lisbon, Portugal
126. Cabrita E, Riesco M.F., Oliveira C., Almeida C., Serradeiro R., Soares F., **Gavaia PJ**, Dinis MT **2016**. Sperm cryopreservation from wild senegalese sole *Solea senegalensis* males. Aquaculture Europe 2016- Aquaculture, Food for Thought. September 20-23, Edinburgh, Scotland.
127. Martins G, Pinto W, Dias J, **Gavaia P** **2016**. Is the origin of dietary protein affecting the skeletal development of zebrafish? Aquaculture Europe 2016- Aquaculture, Food for Thought. September 20-23, Edinburgh, Scotland.
128. Diogo P, Eufrásio A, Martins G, Cardeira J, Cancela L, Cabrita E, **Gavaia P** **2016** Analysis of sperm quality in a type I diabetes zebrafish model. 20th Annual ESDAR Conference 2016. October 27-29 Lisbon, Portugal.
129. O'kane A, Carson M, Clarke S, **Gavaia PJ**, Laizé V, Cancela L, Sheldrake G, Walsh P **2017**. The Osteogenic Potential of Brown Seaweeds Extracts. BIOPROSP, the 8th International Conference on Marine Bioprospecting March 08-10 Tromso, Norway
130. Cardeira J, **Gavaia PJ**, Almeida P, Laizé V **2017** RNA-Seq reveals distinct transcriptomic signatures between blastema formation and outgrowth stages during zebrafish fin regeneration: emphasis on osteogenic mechanisms. 10th European Zebrafish Meeting July 3-7, Budapest congress centre, Budapest, Hungary.
131. Tarasco M, Laizé V, Cardeira J, Cancela ML, **Gavaia PJ** **2017**. Assessment of osteo-active/toxic compounds in zebrafish operculum system. 10th European Zebrafish Meeting July 3-7, Budapest congress centre, Budapest, Hungary.

132. Carson M, Nelson J, Gilmore B, Rae M, **Gavaia P**, Laizé V, Cancela L, Clarke S **2017**. Marine organism-derived extracts for bone growth: the discovery of novel osteogenic compounds. Bone Research Society Meeting, June 25-27, Bristol, UK.
133. Viegas MN, Aguiar C, Salgado MA, Almeida A, **Gavaia P**, Dias J **2017**. Inorganic and organic dietary trace elements: effect on *Solea senegalensis* larvae growth and bone status. 17th Fish & Shellfish Larviculture Symposium. September 4-7. Ghent University, Belgium.
134. Marques C, Roberto VP, Granadeiro L, **Gavaia PJ**, Laizé V, Cancela ML, Fernandez I **2017**. Pxr in a marine fish species senegalese sole (*Solea senegalensis*), much more than a xenobiotic sensor. 17th Fish & Shellfish Larviculture Symposium. September 4-7. Ghent University, Belgium.
135. Castanho S, **Gavaia PJ**, Pinto W, Candeias-Mendes A, Pousão-Ferreira P, Conceição L, Dias J **2017**. dietary mineral and vitamin premixes affect growth and skeletal quality of meagre *Argyrosomus regius* post-larvae. Aquaculture Europe 2017 Cooperation for growth. October 17-20, Dubrovnik, Croatia.
136. Gonçalves RA, Tarasco M, Schatzmayr D, Gavaia P **2017** Moniliformin, an emerging threat to aquaculture species? Aquaculture Europe 2017 Cooperation for growth. October 17-20, Dubrovnik, Croatia.

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 aquícolas. 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 aquícolas. 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.

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 Mougá; 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) (nº.24969) “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 de 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) (n° 51325) Breeding and husbandry of Zebrafish (*Danio 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) (n° 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) (n° 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) (n° 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 (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) (n° 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 Ciências Biomédicas. University of Algarve, Faro. (Supervisors: Ignacio Fernández and Paulo J. Gavaia)

Ines de Almeida Mendes Marques de Carvalho (2016) (n° 49457) Efeitos do tratamento com dapsona 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)

Domingos António D. R. Limpo Prata (2017) (n° 51584) Effects of the Fusarium micotoxin, moniliformin on osteoblastic differentiation and mineralization. Trabalho monografia de final de curso - Licenciatura em Ciências Biomédicas. University of Algarve, Faro. (Supervisors: Paulo J. Gavaia and Vincent Laizé)

Cristina Florica Marcut (2017) (n° 52840) Effect of diabetes type I in the skeletal development of zebrafish. Trabalho monografia de final de curso - Licenciatura em Ciências Biomédicas. University of Algarve, Faro. (Supervisor: Paulo J. Gavaia)

Rita Biltos Lopes Gonçalves Machado (2017) (n° 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) (n°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)

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)

PhD

Filipe 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. (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. (Supervisors: Paulo J. Gavaia, Elsa Cabrita and Leonor Saúde)

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

Post-Graduate Training

2012-2014 Ignacio Fernández Monzon “Integrative roles of Vitamin K: nutritional requirements for better bone development.” Post-doctoral fellowship FCT (SFRH/BPD/82049/2011)

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

Jury for Academic Degrees

PhD

2008 Ana Rodriguez de la Rúa Franch: Estudio del ciclo reproductor y la talla mínima de madurez de moluscos bivalvos y cefalópodos de interés pesquero en las costas Andaluzas. Supp. Examiner in PhD Thesis in Marine Sciences. University of Cádiz, Spain. 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 cromossómica. Supp. Examiner in PhD Thesis in Marine Sciences. University of Cádiz, Spain. 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., Herraiez, 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. 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: I. Palmeirim, M. P. Macedo, M. Gomes, S. Sousa, M. L. Cancela, **P. J. Gavaia**, G. 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), Frances Padrós Bover, M. Carmen Bouza Fernandez

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

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, Natércia 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

Research Projects

Coordination

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-** 04/2017 to 03/2020. **Budget-** 427.275,81€. **Research team:** *Coordinator:* P.J. Gavaia; *Members:* Leonor Cancela, Natércia Conceição, Elsa Cabrita, Rui O. Santos, Graça Miguel, João Reis, Vincent Laizé, João Silva. *Participant institutions:* UALG / CCMAR.

33/SI/2015 (LARVAMIX) Title: Desenvolvimento de uma prémistura de micronutrientes para otimizar as dietas para larvas de peixes marinhos. **Funding entity:** Programa Operacional CRESC Algarve 2020. **Duration-** 04/2016 to 03/2019. **Budget-** 119.905,21 Euro **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 Ciência 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 Ciência 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

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-** 04/2017 to 03/2020. **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-** 04/2017 to 03/2020. **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-** 04/2017 to 03/2020. **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.

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 mineralogenic 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-Egypt. **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.

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-** 06/2003-2006. **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

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_Açções 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-Francesas Programa 2007/2008 with the IFREMER – “Bone Biology of deep-sea fish DEEPBONE” (3,000 €) (collaboration with Sarrazin J, Ifremer, France)

AI-E-54/11Title: 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

Algeniuty (UK) 2017

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.

Teaching activity

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

2006 to present Sistemas Orgânicos Funcionais_101 (Biologia do osso e cartilagem), 1º ciclo Ciências Biomédicas– University of Algarve

2007 to present 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 “1ª 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 “2ª 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.

Jury in international contests

2006- Imagen 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

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.

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
- Reproduction Fertility and Development
- Turkish Journal of Aquaculture