

CURRICULUM VITAE

Personal data:

Name: Ignacio Valentín
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Resume:

Dr. Fernandez had a Bachelor degree in Marine Sciences (Marine Pollution and Environment) since 2004 (1996-2004) by the University of Vigo (UVIGO), Spain; a Graduate degree in Aquaculture Production since 2004 (2002-2004) by Instituto Gallego de Formación en Acuicultura (I.Ga.F.A.), Isla de Arousa, Spain; a Postgraduate Certificate in Education by the University of Vigo (2005); and a Master in Aquaculture (2006-2008) by the University of Barcelona (UB), Spain. In 2011 he got his PhD in Biology by the University of Barcelona (UB, Spain) on the area of nutrition and early development under the supervision of Dr E. Gisbert (IRTA-UB) and Dr. JL. Zambonino (NUAGE IFREMER-Brest; France) with the thesis title: Hypervitaminosis A effects on *Sparus aurata* and *Solea senegalensis*: characterization of larval performance and the underlying gene expression of abnormal skeletogenesis; where the effect of vitamin A on marine fish early development has been studied applying multidisciplinary approaches (*in vivo* and *in vitro* approaches, histology and immunohistochemistry procedures and transcriptomic analysis by qPCR and microarrays). For such degree, he was granted by the Ministry of Education and Culture (MEC) of the Spanish Government with a FPI fellowship. During his PhD he got also the Certificate in Laboratory Animal Science by the University of Barcelona (Spain). Afterwards, he was granted by the Portuguese Foundation for Science and Technology (FCT) with one postdoc fellow at the Centre of Marine Sciences (CCMAR, Portugal) with Professor Dr. Cancela, Dr. Laize, and Dr. Gavaia (2012-present; <http://bioskel.ccmar.ualg.pt/>). There, his research was focus on vitamin K effects on fish larvae development and started a new research line on how pollutants and human drugs might affect bone development through the pregnane X receptor; and increasing his experience in molecular biology techniques (cloning, knocking down gene function by microinjection of morpholinos, *in vivo* live imaging procedures and transcriptomic analysis by Next Generation Sequencing (NGS) technologies among others).

Along his research career he performed several mobility actions and attended to specific workshops. In this sense, he had training at: University of Nordland with Dr. J. Fernandes (Next-Generation Sequencing in microRNAs, Hands on Illumina MiSeq and CLC genomic workbench (QIAGEN) platforms; Bodo, Norway, 2015); The Marine Science Station of Toralla with Dr. A. Caballero (Marine Evolutionary Genomics and Proteomics; Toralla, Spain, 2014); The Research and Training Institute for Agriculture and Fisheries with Dr. M. Machado (Cooperation and biotechnology for a sustainable aquaculture; El Toruño, Spain, 2013); The Instituto Gulbenkian de Ciência with Dr. P. Fernandes (Training Programme in Bioinformatics, Lisbon, 2012); The University of Algarve (LARVITA Fish Larvae Training School; Faro, Portugal, 2010); The Instituto de Ciencias Marinas de Andalucía (ICMAN-CSIC) with Dr. Carmen Sarasquete (Histology and immunohistochemistry procedures); The University of Bergen (Training course on prevention of malformations in Atlantic salmon; Bergen, Norway, 2009); The IFREMER-Brest Center with Dr. D. Mazurais (Gene expression analysis by microarrays; France 2009); The University of Algarve with Dr. ML. Cancela (hands on *in vitro* cell culture); and the IFREMER-Brest with Dr. Ch. Cahu (Feed formulation; 2007). The different research skills gained all over the years gave him the possibility to improve his research knowledge, skills and capacities as well as having an interesting international networking to pursue his main research objectives. Nowadays, he is interested in studying how pollutants, and particularly commonly used human drugs, might affect the physiology of aquatic organisms through PXR: a xenobiotic sensor; and the discovery of new markers of pollutant exposure applying NGS technologies.

He had a total of 30 publications: 21 research articles (11 as first author) in peer-reviewed journals; 3 research articles recently submitted; and 6 book chapters. He presented his work in 44 scientific meeting communications, 25 as posters and 19 as oral presentations (4 as invited speaker).

Academic experience:

2011-PhD Doctoral Thesis at Universidad de Barcelona. Title: **Hypervitaminosis A effects on *Sparus aurata* and *Solea senegalensis*: characterization of larval performance and the underlying gene expression of abnormal skeletogenesis**"

2008-Master in Aquaculture. Universidad de Barcelona-Universidad Autónoma Barcelona-Universidad Politécnica de Cataluña.

2004-Bachelor's degree in Marine Sciences. Marine environment and pollution. Universidad de Vigo.

2004-Technical studies in aquaculture production. Instituto Gallego de Formación en Acuicultura (I.Ga.F.A.). Isla de Arousa.

Experience:

2012-present POST-DOC GRANT: Integrative roles of Vitamin K: nutritional requirements for better bone development (SFRH/BPD/82049/2011) at Centre of Marine Sciences (CCMAR, Faro, Portugal). Funded by: Fundação para a Ciência e a Tecnologia (Portugal).

2011-2011 Contracted at Centre de Acuicultura IRTA, Sant Carles de la Ràpita. LIFECYCLE – Building a biological knowledge-base on fish life cycles for competitive, sustainable European aquaculture.

2006-2010-PhD grant (FPI-MICINN) at Centre de Acuicultura IRTA, Sant Carles de la Ràpita. Supervisors Dr. Enric Gisbert (IRTA) and Dr. Jose Luis Zambonino (INRA-IFREMER, Brest-France).

2005-2006-Contracted at Instituto de Investigaciones Marinas de Vigo. National Reference Lab in Mollusc Pathology. CSIC. Project: Welfare and health in sustainable aquaculture (UE). Improving welfare and health of farmed fish through reduced stress and improved immune competence in Atlantic salmon and European sea bass.

2004-2005.Grant Fundación ProVigo, at Instituto de Investigaciones Marinas de Vigo. National Reference Lab in Mollusc Pathology. CSIC. Working on the evaluation of the possible transmission of prions (scrapie and BSE) to different fish species, using brains of scrapie infected mice as a prions transmission source.

2004-Practice in Selonda Aquaculture Group during three months, at its hatchery-nursery of European sea bass and gilthead sea bream in Selonda-Bay.

Research projects and EU Cost Actions:

PROJECT: Welfare and health in sustainable aquaculture (Nº ref. project: 501984 WEALTH) Funded by: European Union FP6 (From: 2000 until: 2007). Dr Beatriz Novoa. Research partners: IMR, IFREMER, CEFAS, HCMR, UM, UGOT, NSVS, FRS, CSIC, WU, ICRAM

PROJECT: Effect of the diet on the larval and juvenile quality from marine fish species: underlying molecular mechanisms of the skeletal deformities and pigmentary problems (Nº ref. project: AGL2005-02478/ACU) Funded by: Ministerio de Educación y Ciencia (Plan I+D+I, 200-2007) (From: 2006 until: 2008). Dr Enric Gibert. Research partners: IRTA, ICMAN-CSIC

PROJECT: LIFECYCLE – Building a biological knowledge-base on fish lifecycles for competitive, sustainable European aquaculture (Nº ref. project: FP7-KBBE-2007-2A) Funded by: European Union FP6 (From: 2009 until: 2012). Dr Enric Gibert. Research partners: 14 partners (9 nations).

PROJECT: The role of lipids on the fish larval quality: effects in the skeletal and pigmentary disorders (AGL2008-03897-C04-01/ACU – COORDINATED PROJECT) Funded by: Ministerio de Ciencia e Innovación (From: 2009 until: 2011). Dr Enric Gibert. Research partners: IRTA (AGL2008-03897-C04-01/ACU), IFAPA (AGL2008-03897-C04-04/ACU).

PROJECT: Integrative roles of Vitamin K: nutritional requirements for better bone development (SFRH/BPD/82049/2011) Funded by: Fundação para a Ciência e a Tecnologia (From: 2012).

PROJECT: Effects of dietary vitamin K supplementation on growth and skeletal development of teleost fish (PTDC/MAR/105152/2008). Funded by: Fundação para a Ciência e a Tecnologia (From: 2008 until: 2012). Dr Paulo Jorge Travessa Gavaia.

PROJECT: Development and characterization of zebrafish stem cells: implications for transgenesis (PTDC/MAR/105313/2008). Funded by: Fundação para a Ciência e a Tecnologia (From: 2008 until: 2013). Dr Vijayakumar Parameswaran.

PROJECT: Assessment of mineralogenic toxicity of aquatic pollutants (PTDC/MAR/112992/2009) Funded by the Fundação para a Ciência e a Tecnologia (From: 2011 until: 2014) Dr Vincent Laizé.

PROJECT: Estudo piloto para melhoramento do status nutricional em vitamina K: otimização da reprodução e demonstração da melhoria na qualidade larvar de linguado/Universidade do Algarve (31-03-05-FEP-0073-Universidade do Algarve-KLING) Funded by: Fundo Europeu de Desenvolvimento Regional (FEDER) - Programa Operacional PROMAR (From: 2014 until: 2015). Dr Paulo Jorge Travessa Gavaia.

EU Cost Action Larvanet (FA0801): Critical success factors for fish larval production in European Aquaculture: a multidisciplinary network. Funded by: EU. (From: 2008 until: 2012). Dr Luis Conceição and Dr Amos Tadler.

EU Cost Action Aquagamete (FA1205): 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. Funded by: EU. (From: 2012 until: 2016). Dr Juan F Asturiano and Dr Akos Horvath.

Research contracts with private companies

Nireus Aquaculture SA (Dr. Dimitris Barkas): Analysis of calcium and phosphorus content in fish feed and bone vertebrae, and histological analysis of fish (*Sparus aurata*) intestine. 2000 Euros.

Stolt Sea Farm SA (Dr. Ana Riaza): Supplementation of vitamin K on live prey enriching emulsion, and development of a protocol for pilot-scale procedures in Senegalese sole (*Solea senegalensis*). 9750 Euros.

Kapa Biosystems (Dr. Mona Møller): Studying the suitability of Menaquinone 7 (MK-7), a vitamin K2 metabolite as a source of vitamin K in fish feed and their role in osteogenesis.

SPAROS SA (Dr. Jorge Dias and Dr. Luis Conceição): developing vitamin K supplemented inert diets for marine fish production (in particular *Solea senegalensis*) and optimizing their levels.

Scientific publications:

Research articles:

1. Ferreira-Rodriguez N, **Fernández I**, Varandas S, Cortes R, Cancela ML, Pardo I, 2016. The role of calcium concentration on *Corbicula fluminea* invasiveness capacity in crystalline basins. *Submitted to Functional Ecology*.
2. **Fernández I**, Ortiz-Delgado JB, Darias M, Hontoria F, Andree KB, Machado M, Sarasquete C, Gisbert E, 2016. Dietary vitamin A unbalance during pre-, pro- or post-metamorphosis differentially affects Senegalese sole (*Solea senegalensis*) skeletogenesis in a thyroid hormone signalling dependant manner. *Submitted to PLoS ONE*.
3. Cardeira J, Gavaia PJ, **Fernández I**, Cancela ML, Laizé V, 2016. Quantitative assessment of the regenerative and *de novo* mineralogenic performances of the zebrafish caudal fin. *Submitted to Scientific Reports*.
4. Marques CL, **Fernández I**, Viegas MN, Cox CJ, Martel P, Rosa J, Cancela ML, Laizé V, 2016. Comparative analysis of zebrafish bone morphogenetic proteins 2, 4 and 16: molecular and evolutionary perspectives. *Cellular and Molecular Life Sciences*, 73:841-857.
5. **Fernández I**, Lopez-Joven C, Andree KB, Roque A, Gisbert E, 2015. Dietary vitamin A supplementation in Senegalese sole (*Solea senegalensis*) early juveniles enhance their immunocompetence against induced bacterial infection: new insights on VA immune system-related underlying pathways. *Fish and Shellfish immunology*, 46, 703-709.
6. **Fernández I**, Vijayakumar P, Marques C, Cancela ML, Gavaia PJ, 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, 745-759.
7. Richard N, **Fernández I**, Wulff T, Hamre K, Cancela ML, Conceição LEC, Gavaia PJ, 2014. Dietary supplementation with vitamin K affects transcriptome and proteome of Senegalese sole, improving larval performance and quality. *Marine Biotechnology* 16, 522-537.
8. **Fernández I**, Santos A, Cancela ML, Laizé V, Gavaia PJ, 2014. Warfarin, a potential pollutant in aquatic environment acting through Pxr signaling pathway and γ -glutamyl carboxylation of vitamin K-dependent proteins. *Environmental Pollution* 194, 86-95.

9. Marques CL, **Fernández I**, Rosa J, Viegas MN, Cancela ML, Laizé V, 2014. Spatiotemporal expression and retinoic acid regulation of bone morphogenetic proteins 2, 4 and 16 in Senegalese sole. *Journal of Applied Ichthyology* 30, 713-720.
10. Ortiz-Delgado JB, **Fernández I**, Sarasquete C, Gisbert E, 2014. Normal and histopathological organization of the opercular bone and vertebrae in gilthead sea bream *Sparus aurata*. *Aquatic Biology* 21, 67-84.
11. **Fernández I**, Tiago DM, Laizé V, Cancela LM, Gisbert E, 2014. Retinoic acid differentially affects *in vitro* proliferation, differentiation and mineralization of two fish bone-derived cell lines: different gene expression of nuclear receptors and ECM proteins. *The Journal of Steroid Biochemistry and Molecular Biology* 140, 34-43.
12. **Fernández I**, Gisbert E, Gavaia P, 2013. Vitamin A and K, two fat-soluble vitamins required for harmonic fish larval development. *Communication in Agricultural and Applied Biological Sciences* 78, 123-124.
13. Darias M, Andree KB, Boglino A, **Fernández I**, Estévez A, Gisbert E, 2013. Coordinated Regulation of chromatophore differentiation and melanogenesis during the ontogeny of skin pigmentation of *Solea senegalensis* (Kaup, 1858). *PLoS ONE* 8: e63005.
14. **Fernández I**, Ortiz-Delgado JB, Sarasquete C, Gisbert E, 2012. Vitamin A effects on vertebral bone tissue homeostasis in gilthead sea bream (*Sparus aurata*) juveniles. *Journal of Applied Ichthyology* 28, 419-426.
15. Gisbert E, Skalli A, **Fernández I**, Kotzamanis Y, Zambonino-Infante JL, Fabregat R, 2012. Protein hydrolysates from yeast and pig blood as alternative raw materials in microdiets for gilthead sea bream (*Sparus aurata*) larvae. *Aquaculture* 338–341, 96-104.
16. Trevino L, Alvarez-Gonzalez CA, Perales-Garcia N, Arevalo-Galan L, Uscanga-Martinez A, Marquez-Couturier G, **Fernández I**, Gisbert E, 2011. A histological study of the organogenesis of the digestive system in bay snook *Petenia splendida* Gunther, 1862 from hatching to the juvenile stage. *Journal of Applied Ichthyology* 27, 73-82.
17. Gisbert E, **Fernández I**, Alvarez-Gonzalez CA, 2011. Prolonged feed deprivation does not permanently compromise digestive function in migrating European glass eels *Anguilla anguilla*. *Journal of Fish Biology* 78, 580-592.
18. **Fernández I**, Darias M, Andree KB, Mazurais D, Zambonino-Infante JL, Gisbert E, 2011. Coordinated gene expression during gilthead sea bream skeletogenesis and its disruption by nutritional hypervitaminosis A. *BMC Developmental Biology* 11-7.

19. **Fernández I**, Gisbert E, 2011. The effect of vitamin A on flatfish development and skeletogenesis: A review. *Aquaculture* 315, Issues 1–2, 34-48.
20. **Fernández I**, Gisbert E, 2010. Senegalese sole bone tissue originated from chondral ossification is more sensitive than dermal bone to high vitamin A content in enriched Artemia. *Journal of Applied Ichthyology* 26, 344-349.
21. **Fernández I**, Pimentel MS, Ortiz-Delgado JB, Hontoria F, Sarasquete C, Estévez A, Zambonino-Infante JL, Gisbert E, 2009. Effect of dietary vitamin A on Senegalese sole (*Solea senegalensis*) skeletogenesis and larval quality. *Aquaculture* 295, 250-265.
22. Gisbert E, Giménez G, **Fernández I**, Kotzamanis Y, Estévez A, 2009. Development of digestive enzymes in common dentex *Dentex dentex* during early ontogeny. *Aquaculture* 287, 381-387.
23. **Fernández I**, Hontoria F, Ortiz-Delgado JB, Kotzamanis Y, Estévez A, Zambonino-Infante JL, Gisbert E, 2008. Larval performance and skeletal deformities in farmed gilthead sea bream (*Sparus aurata*) fed with graded levels of Vitamin A enriched rotifers (*Brachionus plicatilis*). *Aquaculture* 283, 102-115.
24. Novoa B, Romero A, Mulero V, Rodríguez I, **Fernández I**, Figueras A, 2006. Zebrafish (*Danio rerio*) as a model for the study of vaccination against viral haemorrhagic septicemia virus (VHSV). *Vaccine* 24, 5806-5816.

Book chapters:

1. Cabrita E, Galindo-Villegas J, Gisbert, E, Koumoundouros G, **Fernandez I**. Quality descriptors and predictors in farmed marine fish larvae and juveniles. Larvanet EU Cost Action Book. Conceição LEC, and Koumoundouros G, [Eds] 2016. *In press*.
2. **Fernández I**, Gavaia PJ. Vitamin K, much more than blood clotting: Roles, metabolism and specific requirements. A mini-review. *Avances en Nutrición Acuícola XIII*. XIII Simposio Internacional de Nutrición Acuícola. Nuevo León (México). Cruz Suárez LE, Ricque Marie D, Tapia Salazar M, Nieto López MG, Villarreal Cavazos DA, Gamboa J, Rivas Vega ME, Miranda A, [Eds] 2016. ISBN: 978-607-27-0593-7.
3. Gisbert E, **Fernández I**, Villamizar N, Darias MJ, Zambonino-Infante JL, Estévez A. Larval development. Chapter 2.4. In: Sánchez-Vázquez F.J. and Muñoz-Cueto J.A. [Eds] 2014. *Biology of European Seabass*. Science Publishers, Hampshire, USA. pp. 162-206. ISBN: 978-1-4665-9945-1.

4. Soares F, **Fernández I**, Costas B, Gavaia PJ. Non-infectious disorders of warm water fish Chapter 7. In: Woo, PTK, Bruno, DW, Lim LHS [Eds] 2014. Diseases and Disorders of Finfish in Cage Culture, 2nd edition. CABI publishing. pp. 254-286. ISBN: 9781780642079.
5. Mazurais D, Darias M, **Fernández I**, Cahu C, Gisbert E, Zambonino-Infante JL. Gene expression pattern during European sea bass larvae development: Impact of dietary vitamins. Pp 91-111. *In*: Marco Saroglia and Zhanjiang (John) Liu [Eds] 2012. Functional Genomics in Aquaculture. John Wiley & Sons, Oxford, UK.
6. E. Gisbert, **I. Fernández**, A. Estévez, 2008. Nutrición y morfogénesis: efecto de la dieta sobre la calidad larvaria en peces. Avances en Nutrición Acuícola IX. IX Simposio Internacional de Nutrición Acuícola. Nuevo León (México). Editores: L. E. Cruz Suárez, D. Ricque Marie, M. Tapia Salazar, M. G. Nieto López, D. A. Villarreal Cavazos, J. P. Lazo, M. T. Viana. 46-78.

Short stages in other research centres:

2015- Marine Genomics research group (lead by Dr. Jorge Fernandes) at University of Nordland (Bodø, Norway). 1 month analysing expression of microRNAs from Senegalese sole (*Solea senegalensis*) plasma samples and zebrafish (*Danio rerio*) tissues, respectively. Hands on Illumina MiSeq and CLC Bio Genomic Workbench (Qiagen) platforms.

2010- Instituto de Ciencias Marinas de Andalucía (CSIC). 2.5 months learning and characterization of the effects of different dietary contents of vitamin A in tissue homeostasis of gilthead sea bream (*Sparus aurata*) juveniles by histochemistry and immunohistochemical techniques.

2009- UMR-1067 NUAGE IFREMER-Brest. Brest (France). 3 months evaluating the gene expression in European sea bass (*Dicentrarchus labrax*) larvae fed different dietary content in vitamin D through microarray.

2008- Centro de Ciencias do Mar. Universidade do Algarve. Faro (Portugal). 3 months learning *in vitro* cell culture procedures and evaluating the effects of retinoic acid on cell proliferation and mineralization of two bone-derived fish cell lines and their underlying gene expression.

2007- UMR-1067 NUAGE IFREMER-Brest. Brest (France). 2 months learning molecular biology tools and feed formulation.

Courses:

“NGS Bioinformatics seminars and workshops: Introductory Unix tools: big data handling” Centre of Marine Sciences, University of Algarve, Gambelas Campus. 30th July 2015. Faro (Portugal).

Workshop: “Workshop on Marine Evolutionary Genomics and Proteomics” University of Vigo, 14-16 October 2014, Vigo, Spain.

GE Healthcare Training Course: “Microcal® course advanced isothermal titration calorimetry”. University of Algarve, Campus of Gambelas, May 14-15th 2014. Faro, Portugal.

GE Healthcare Training Course: “ImageQuant LAS 500”. University of Algarve, Campus of Gambelas, February 11th 2014. Faro, Portugal.

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

Workshop: “Aquagenet: cooperation and biotechnology for a sustainable aquaculture in SUDOE region”. IFAPA, Centro el Toruño, November 28th 2013. Puerto de Santa Maria, Cadiz, Spain.

“NGS Bioinformatics seminars and workshops: How to use the CCMAR Computational Cluster Facility (Gyra)” Centre of Marine Sciences, University of Algarve, Gambelas Campus. 27th September 2013. Faro (Portugal).

“NGS Bioinformatics seminars and workshops: Mapping and Assembly Workshop”. Centre of Marine Sciences, University of Algarve, Gambelas Campus. 27th June 2013. Faro (Portugal).

Biotechnology applied to aquaculture. Workshop. Aquagenet. November 8th 2012. Faro (Portugal).

Hunting for Promoters using NGS data. The Gulbenkian Training Programme in Bioinformatics. Instituto Gulbenkian de Ciência (IGC). October 22nd to 25th 2012. Oeiras (Portugal).

Seminar Production of Techniques of Mass Sequencing of New Generation (NGS) for Aquaculture and other Systems of Biological Production. Aquagenet. March 16th 2011. Barcelona (Spain).

LARVITA Fish Larvae Training School. November 22nd to 26th 2010. University of Algarve. Faro (Portugal).

Fine fish - Training course on prevention of malformations in ATLANTIC SALMON. March 26nd to 27th 2009. Bergen (Norway).

Course for Certification for Working in Animal Experimentation. Generalitat de Catalunya, Departament de Medi Ambient i Habitatge, Direcció General del Medi Natural. September 2009. Barcelona (Spain).

Course for Postgraduate Certificate in Education. 2005. University of Vigo. Vigo (Spain).

Professional course on acuariophilia. "Business applications." 2004-First level (35 h). Carlos Temperán. I.Ga.F.A. Isla de Arousa.

Professional course on acuariophilia. "Business applications." 2004-Second level (65 h). Carlos Temperán. I.Ga.F.A. Isla de Arousa.

Congress contributions:

1. Fernandez I., 2016. Transcriptomic approaches for fish physiology. **Oral communication (invited by organizers)**. I International Colloquium on Fish Physiology and Functional Genomics. Villahermosa (Mexico).
2. Fernandez I., Granadeiro, L., Koop, M., Fernandes, J.M.O., Dirks, R.P., Gavaia, P., Laizé, V., Cancela, M.L. 2016. Vitamin K deficiency in fish early development: characterization and underlying pathways by rnaseq analysis in zebrafish (*Danio rerio*). **Oral communication**. 4th Genomics in Aquaculture Symposium. Athens (Greece).
3. Fernandez I., 2015. Molecular mechanisms of the response to vitamin K. **Oral communication**. Workshop: Pilot study for the vitamin K nutritional status improvement: optimization of the reproduction and demonstration of a better larval quality in Senegalese sole (*Solea senegalensis*). Faro (Portugal).
4. Fernández I, Cardeira J, Granadeiro L, Gavaia PJ, Laizé V, Cancela M, 2015. The use of *in vivo* imaging tools in zebrafish for drug discovery for bone development and homeostasis. **Oral communication (invited by organizers)**. I Iberian Congress for Laboratory Animal Science. Caceres (Spain).
5. Fernández I, 2015. Vitamin K, much more than blood. An update on its roles, metabolism and requirements in fish species. **Oral communication (invited by organizers)**. XIII International Symposium on Aquaculture Nutrition. Hermosillo (Mexico).
6. Fernández I, Granadeiro L, Gavaia PJ, Laizé V, Cancela ML, 2015. Zebrafish as a model for unveiling underlying signaling pathways of warfarin embryopathy. **Oral communication (invited by organizers)**. FASEB - Molecular, structural & clinical aspects of vitamin k & vitamin k-dependent proteins. Chicago (IL, USA).
7. Gavaia PJ, Fernandez I, Pimentel A, Neves PL, Cancela ML, 2015. The effects of cinacalcet and paricalcitol in the skeleton of warfarin treated fish. Poster. FASEB -

Molecular, structural & clinical aspects of vitamin k & vitamin k-dependent proteins. Chicago (IL, USA).

8. Granadeiro L, Gavaia PJ, Laizé V, Cancela ML, Fernández I, 2015. Zebrafish skeletal development and vitamin K deficiency: a warfarin embryopathy model. Poster. IV Interdisciplinary Approaches in Fish Skeletal Biology. Tavira (Portugal).
9. Gisbert E, Fernández I, Zambonino-Infante JL, 2013. Advances in marine fish larval nutrition: the challenge of feeding the smallest living vertebrates. **Oral communication**. 9th Symposium of the World's Chinese Scientists on Nutrition and Feeding of Finfish and Shellfish. Xiamen (China).
10. Fernández I, Gisbert E, Gavaia PJ, 2013. Vitamin A and K, two fat soluble vitamins required for harmonic fish larval development. **Oral communication**. 6th fish & shellfish larviculture symposium. Ghent (Belgium).
11. Gavaia PJ, Fernández I, Diogo P, Cancela ML, Dias J, 2013. Effects of the vitamin K antagonist warfarin on zebrafish skeletal development Poster. 8th European Zebrafish Meeting. Barcelona (Spain).
12. Fernández I, Parameswaran V, Laizé V, Gavaia PJ, 2013. Mineralogenic cell line ZFB1 established from zebrafish (*Danio rerio*) as a tool for deciphering vitamin K roles in bone homeostasis: warfarin and vitamin K effects on cell proliferation and mineralization. Poster. 8th European Zebrafish Meeting. Barcelona (Spain).
13. Gavaia PJ, Santos A, Cancela ML, Fernández I, 2013. Vitamin K antagonist warfarin affects *Danio rerio* skeletal development and arterial calcification. Poster. III Interdisciplinary Approaches in Fish Skeletal Biology. Tavira (Portugal).
14. Fernández I, Parameswaran V, Cancela ML, Laizé V, Gavaia PJ, 2013. ZFB1 cell line, an in vitro tool to unveil mineralogenic and skeletogenic roles of vitamin K in zebrafish. Poster. III Interdisciplinary Approaches in Fish Skeletal Biology. Tavira (Portugal).
15. Marques CL, Fernández I, Rosa J, Viegas MN, Cancela ML, Laizé V, 2013. BMP2, 4 and 16: A new evolutionary perspective. Poster. III Interdisciplinary Approaches in Fish Skeletal Biology. Tavira (Portugal).
16. Fernández 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. **Oral communication**. AQUA2012, Prague (Czech Republic).

17. Fernández I., Gisbert E., Cancela M. L., Gavaia P.J., 2012. Fish skeletal deformities: a major impact on aquaculture with different etiologies. **Oral communication**. AQUA2012, Prague (Czech Republic).
18. 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. **Oral communication**. XV International Symposium on Fish Nutrition and Feeding, Molde (Norway).
19. Fernández I., Ortiz-Delgado J. B., Darias M., Andree K. B., Manchado M., Sarasquete C., Gisbert E., 2011. Vitamin A and thyroid hormone *in vivo* crosstalk at tissue and transcriptional level during larval development of *Solea senegalensis*. **Oral communication**. Aquaculture Europe, Rhodes (Greece).
20. Fernández I., Ortiz-Delgado J. B., Sarasquete C., Gisbert E., 2011. Vitamin A dose and developmental timing dependant effects on Senegalese sole (*Solea senegalensis*) larvae skeletogenesis. **Oral communication**. Interdisciplinary Approaches in Fish Skeletal Biology. Tavira (Portugal).
21. Fernández I., Ortiz-Delgado J. B., Sarasquete C., Gisbert E., 2011. Vitamin A effects on vertebral bone tissue homeostasis in gilthead sea bream (*Sparus aurata*) juveniles. Poster. II Interdisciplinary Approaches in Fish Skeletal Biology. Tavira (Portugal).
22. Fernández I., López-Joven C., Roque A., Gisbert E., 2011. Vitamin A enhances the immune response in juvenile Senegalese sole challenged with *Photobacterium damsela* subsp. *piscicida*. **Oral communication**. The cultivation of soles V. Universidade do Algarve, Faro (Portugal).
23. Fernández I., Hontoria F., Gisbert E., 2010. Vitamin A and Senegal sole *Solea senegalensis* larvae: the effect of timing and dietary content on larval performance. Poster. XIV International Symposium on Fish Nutrition and Feeding. Qingdao (China).
24. Fernández I., Duncan N., Estévez A., Hontoria F., Gisbert E., 2010. Effects of different dietary vitamin A levels on the spawning performance and offspring quality of gilthead sea bream *Sparus aurata* broodstock. Poster. XIV International Symposium on Fish Nutrition and Feeding. Qingdao (China).
25. Fernández I., Tiago D. M., Laizé V., Cancela M. L., Gisbert E., 2010. Effect of retinoic acid on the *in vitro* proliferation, mineralization and related-gene expression of gilthead sea bream *Sparus aurata* bone-derived cell lines. **Oral**

- communication. The Younger Scientist Award.** XIV International Symposium on Fish Nutrition and Feeding. Qingdao (China).
26. Fernández I, Gisbert E., 2009. New insights of the effects of dietary vitamin A on flatfish skeletogenesis: the case of *Solea senegalensis*. **Oral communication.** Larvi'09. Ghent (Belgium).
 27. Fernández I., Darias M., Andree K.B., Mazurais D., Zambonino-Infante J.L., Gisbert E., 2009. *In vivo* effects of the dietary vitamin A content on the skeletogenesis of gilthead sea bream (*Sparus aurata*): gene expression regulation by retinoic acid receptors (RARs). Poster. II Symposium of Catalonian Aquaculture. Sant Cales de la Rápita (Spain).
 28. Fernández I., Tiago D. M., Laizé V., Cancela M. L., Gisbert E., 2009. Retinoic acid effects on the *in vitro* proliferation and mineralization of bone-derived cell lines from gilthead sea bream (*Sparus aurata*). Poster. II Symposium of Catalonian Aquaculture. Sant Cales de la Rápita (Spain).
 29. Fernández I., Gisbert E., 2009. Effects of the nutritional imbalance in vitamin A applied to different developmental stages of Senegalese sole. **Oral communication.** II Symposium of Catalonian Aquaculture. Sant Cales de la Rápita (Spain).
 30. Fernández I., López C., Padrós F., Roque A., Gisbert E., 2009. Dietary vitamin A supplementation in Senegal sole (*Solea senegalensis*) enhances larval resistance to an induced bacterial infection. Poster. **2^a prize to best poster.** World Aquaculture Society 2009. Veracruz (México).
 31. Fernández I., Hontoria F., Gisbert E., 2009. Sensitiveness to a different vitamin A doses on the diet of Senegalese sole (*Solea senegalensis*) larvae depending on the developmental stage. Poster. XII National Aquaculture Congress. Madrid (Spain).
 32. Fernández I., Tiago D., Laizé V., Cancela M. L., Gisbert E., 2009. Effect of retinoic acid on the proliferation and *in vitro* mineralization of sea bream bone-derived cell lines. Poster. Interdisciplinary Approaches in Fish Skeletal Biology. Tavira (Portugal).
 33. Fernández I., Darias M., Andree K. B., Gisbert E., 2009. Dietary vitamin A influences gilthead sea bream (*Sparus aurata*) skeletogenesis through the retinoic acid pathway. Poster. Interdisciplinary Approaches in Fish Skeletal Biology. Tavira (Portugal).

34. Ortiz-Delgado J. B., Fernández I., Gisbert E., Sarasquete C., 2009. Histological organization of the skeletal tissue in deformed vertebrae and operculum of gilthead sea bream (*Sparus aurata*) juveniles. Poster. Interdisciplinary Approaches in Fish Skeletal Biology. Tavira (Portugal).
35. Fernández I., Gisbert E., 2009. Bone tissue originated from endochondral ossification is more sensitive than intramembraneous bone to vitamin A dietary unbalances in Senegal sole early juveniles. **Oral communication**. Interdisciplinary Approaches in Fish Skeletal Biology. Tavira (Portugal).
36. Fernández I., Hontoria F., Estévez A., Gisbert E., 2008. Larval performance and skeletal deformities in farmed gilthead sea bream (*Sparus aurata*) fed with graded levels of vitamin A. Poster. International Symposium on Fish Nutrition and Feeding. Florianópolis (Brazil).
37. Fernández I., Andree K. B., Gisbert E., 2008. Effects of vitamin A on the expression of selected genes involved in the skeletogenesis of gilthead sea bream (*Sparus aurata*). Poster. International Symposium on Fish Nutrition and Feeding. Florianópolis (Brazil).
38. Pimentel M., Fernández I., Hontoria F., Estévez A., Gisbert E., 2008. Skeletal deformities in farmed Senegalese sole (*Solea senegalensis*) fed with graded levels of vitamin A. Poster. International Symposium on Fish Nutrition and Feeding. Florianópolis (Brazil).
39. Fernández I., Pimentel M., Gisbert E., 2008. Effect of vitamin A on the skeletogenesis of Senegalese sole (*Solea senegalensis*). **Oral communication**. The cultivation of soles IV. Faro (Portugal).
40. Pimentel M., Fernández I., Hontoria F., Estévez A., Gisbert E., 2008. Skeletal deformities in Senegal sole (*Solea senegalensis*) fed *Artemia* nauplii enriched with graded levels of vitamin A. Poster. 8º Larval Biology Symposium. Lisboa (Portugal).
41. Pimentel M., Fernández I., Hontoria F., Estevez A., Gisbert E., 2008. Effect of the vitamin A on the larval quality of sole (*Solea senegalensis*). Poster. I Symposium of Catalonian Aquaculture. Barcelona (Spain).
42. Fernández I., Estevez A., Hontoria F., Gisbert E., 2008. Effect of the vitamin A on vertebral column skeletal deformities of gilthead sea bream (*Sparus aurata*). Poster. I Symposium of Catalonian Aquaculture. Barcelona (Spain).

43. Fernández I., Hontoria F., Gisbert E., 2007. Fasting effects in rotifer (*Brachionus plicatilis*): vitamin A and total lipid metabolism and content in nutritional studies for marine fish larvae. Poster. XI Poster. XI National Aquaculture Congress. Vigo (Spain).
44. Fernández I., Estévez A., Gisbert E., 2007. Dietary vitamin A effects on the quality and growth in the larval culture of gilthead sea bream (*Sparus aurata*). Poster. XI National Aquaculture Congress. Vigo (Spain).

Congress and workshops organization:

Part of the Organizing Committee of the Workshop: Pilot study for the vitamin K nutritional status improvement: optimization of the reproduction and demonstration of a better larval quality in Senegalese sole (*Solea senegalensis*). 2015, Faro (Portugal).

Organizer of the Workshop: "Estudios del desarrollo osteológico en larvas de peces". 5-10th November, 2015. Universidad Juárez Autónoma de Tabasco, Villahermosa (Mexico).

Part of the Local Organizing Committee of III and IV Interdisciplinary Approaches in Fish Skeletal Biology. Tavira (Portugal).

Research prizes and other recognitions:

Early stage researcher Short-Term Scientific Mission Award from Aquagamete Cost Action FA1205. 2015, Bodø, Norway.

Early stage researcher Travel and Fee Grant Award from Larvanet Cost Action FA0801. Larvi'13. Ghent (Belgium).

Post-Doctoral grant, Reference SFRH/BPD/82049/2011 from Portuguese Foundation for Science and Technology (FCT). 2011, Centre of Marine Sciences (CCMAR), Faro (Portugal).

Early stage researcher Travel and Fee Grant Award from Larvanet Cost Action FA0801. Aquaculture Europe 2011, Rhodes (Greece).

The Younger Scientist Award. XIV International Symposium on Fish Nutrition and Feeding 2010. Qingdao (China).

Travel and Fee Grant Award. XIV International Symposium on Fish Nutrition and Feeding 2010. Qingdao (China).

Early stage researcher Travel and Fee Grant Award from Larvanet Cost Action FA0801. Larvi'09. Ghent (Belgium).

2^a prize to best poster. World Aquaculture Society 2009. Veracruz (México).

PhD grant (FPI-MICINN) Reference BES-2006-12650 from Ministry of Education and Culture (MEC) of the Spanish Government. 2006, Research and Technology Food and Agriculture (IRTA), Sant Carles de la Rapita (Spain).

Grant for “Observatorio Medioambiental de la Ria de Vigo” from Fundacion Provigo. 2004, Instituto de Investigaciones Marinas (The Spanish National Research Council), Vigo (Spain).

Teaching experience:

Workshop: “Estudios del desarrollo osteológico en larvas de peces”. 5-10th November, 2015. Universidad Juárez Autónoma de Tabasco, Villahermosa (Mexico).

Lecture: “Nutrigenomics: how nutrients control gene transcription using fish as a research model. The case of vitamins A and K”. Master in Molecular Biology and Microbiology. Dept. of Biomedical Sciences and Medicine. University of Algarve Campus de Gambelas. 30th May 2014.

Lecture: “Steroid receptors in bone”. Master in Biomedical Sciences. Dept. of Biomedical Sciences and Medicine. University of Algarve Campus de Gambelas. 28th January 2014.

Lecture: “Vitamin K and bone biology”. Master in Biomedical Sciences. Dept. of Biomedical Sciences and Medicine. University of Algarve Campus de Gambelas. 28th January 2014.

Lecture: “Nutritional imbalances as a source of non-infectious diseases: the case of vitamin A and vitamin K”. Master in Aquaculture. University of Algarve Campus de Gambelas. 30th October 2013.

Lecture: “Vitamin K and bone biology”. Master in Biomedical Sciences. Dept. of Biomedical Sciences and Medicine. University of Algarve Campus de Gambelas. 11th March 2013.

Academic orientation of students:

Supervised students:

2016-Gael Nuñez. Supervision of his technical practices of the Galician Institute in Aquaculture (IGaFA), Spain.

2016-Vanessa Moreira, Supervision of her research work entitled: Transcriptional splicing exon 2 of vitamin K epoxide reductase morpholino’s injection on skeletal development of zebrafish (*Danio rerio*); for completing her Bachelor degree in Biomedical Sciences. University of Algarve, Faro, Portugal.

2016-Elena Pagter, Supervision of her internship within her EMBC+ master programme.

2014-2015 Luis Granadeiro. Supervision of his research work entitled: "Effects of vitamin K deficiency and its mechanisms in vertebrate's early development: zebrafish as a model." for completing his Master degree in Biomedical Sciences. University of Algarve, Faro, Portugal.

2015-Benito Vidal. Supervision of his technical practices of the Galician Institute in Aquaculture (IGaFA), Spain.

2015-Andre Lopes. Supervision of his research work entitled: Crosstalk of fat soluble vitamins (A and K) in zebrafish (Danio rerio) early development; for research work during Master in Aquaculture and Biodiversity. University of Algarve, Faro, Portugal.

2015-Carlos Marques. Supervision of his research work entitled: PXR cloning, expression and identification of splice variants in zebrafish (Danio rerio); for completing his Bachelor degree in Biochemistry. University of Algarve, Faro, Portugal.

2014-Paulo Pais Millán. Supervision of his technical practices of the Galician Institute in Aquaculture (IGaFA), Spain.

2013-Luis Granadeiro. Supervision of his research work entitled: Effect of vitamin K epoxide reductase morpholino's injection on skeletal development of zebrafish (Danio rerio); for completing his Bachelor degree in Biomedical Sciences. University of Algarve, Faro, Portugal.

2013-Santi Guillan Tirado. Supervision of his technical practices of the Galician Institute in Aquaculture (IGaFA), Spain.

2012-Adriana Isabel Fernandes Santos. Supervision of their research work entitled: Effects of sodium warfarin as an inhibitor of vitamin K on the larval skeletal development of zebrafish (Danio rerio); for completing her Bachelor degree in Biology. University of Algarve, Faro, Portugal.

Present students under supervision:

2016-2017 Simrith Cordoba__Supervision of her research work entitled: Skeletal development of Tropical gar and effects of increasing temperature during embryonic development; for completing her Bachelor degree in Biology. Universidad Autonoma Juarez de Tabasco, Villahermosa, Mexico.

2016-2017 Tatiana Varela Supervision of her research work entitled: Transcriptional control by miR-9 of differentially expressed genes in zebrafish embryos under VK deficiency; for completing her Master degree in Microbiology and Molecular Biology. University of Algarve, Faro, Portugal.

Languages:

Spanish (Native)

Galician (Native)
English (Proficiency)
French (Intermediate)
Portuguese (Intermediate)
Catalonian (Intermediate)

Other interests/courses:

2003-Marine competence (60 h) I.Ga.F.A. Isla de Arousa.

2003-"III Course in biology and veterinarian medicine of cetaceans" (20 h) Facultad de Biología da Universidad de Santiago. CEMMA. Santiago de Compostela.

2002-"I workshop on the study and conservation of the protected marine fauna" (11 h) Universidad de Vigo. CEMMA. Vigo.

2002-"Workshop in aquaculture and cooperatives". I.Ga.F.A. Isla de Arousa.

2002-"II Course in biology and veterinarian medicine of cetaceans" (20 h) Facultad de Biología da Universidad de Santiago. CEMMA. Santiago de Compostela.

2001-"Summer workshop in Cetaceans" (140 h). CEMMA. O Grove.

2001-"I Course in biology and veterinarian medicine of cetaceans" (20 h) Facultad de Biología da Universidad de Santiago. Coordinadora para el Estudio de los Mamíferos Marinos (CEMMA). Santiago de Compostela.

2000-FEDAS diving license. Club Inmersión Puerto Almirante. Cabo de Palos. Murcia.