

an introduction to the **ParaFishControl project**

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Michaël Bekaert (and a cast of thousands.....)

THE EU FRAMEWORK PROGRAMME
FOR RESEARCH AND INNOVATION

HORIZON 2020



EXCELLENT SCIENCE
COMPETITIVE INDUSTRIES
BETTER SOCIETY

EU Horizon 2020

Call identifier:

Sustainable Food Security

Work programme topics:

Tackling disease related challenges and threats faced by European farmed aquatic animals

Issue:

Scientific basis and tools for preventing and mitigating parasitic diseases of European farmed fish

Project Goal

The clue's in the name.... **Parasites of Fish Control**

To “increase the sustainability and competitiveness of the European aquaculture industry by improving our understanding of fish-parasite interactions and by developing innovative solutions and tools for the prevention, control and mitigation of the major parasitic pathogens affecting the main European farmed fish species”

Five year study funded, starting April 1st 2015

Some problems addressed

- No commercial vaccines for fish parasites
- Principal diagnostic tools do not cover the main parasitic diseases or are not harmonised
- Number of licensed veterinary medicines targeting aquatic parasites remains low, may have major environmental impact and may show reduced efficacy due to parasite drug resistance
- Lack of knowledge concerning transfer of parasites between wild / cultured fish populations

Consortium synergies

- Integration of academic, industrial and private research expertise and resources from across Europe
- Access to well-founded research facilities
- Access to diverse biological resources and established host-parasite models
- Access to state-of-the-art immunology, vaccinology, genomics, proteomics and transcriptomics technologies and capabilities

Consortium Leader – Prof. Ariadna Sitjà-Bobadilla
Agencia Estatal Consejo Superior de Investigaciones Científicas
(CSIC)



30 Partners from 13 countries

Public Research Organisation partners:

Partner	Location	Type
Agencia Estatal Consejo Superior de Investigaciones Científicas (CSIC)	Spain	PRO
Aarhus Universitet (AU)	Denmark	PRO
Biology Centre of the Academy of Sciences of the Czech Republic (BCAS)	Czech Republic	PRO
The Secretary of State for Environment, Food and Rural Affairs (DEFRA - CEFAS)	United Kingdom	PRO
Danmarks Tekniske Universitet (DTU)	Denmark	PRO
Hellenic Centre for Marine Research (HCMR)	Greece	PRO
Institut za oceanografiju i ribarstvo (IOR)	Croatia	PRO
Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria (INIA)	Spain	PRO
Københavens Universitet (KU)	Denmark	PRO
Magyar Tudományos Akadémia (MTA)	Hungary	PRO
Universidade de Santiago de Compostela (USC)	Spain	PRO
Università degli Studi di Udine (UNIUD)	Italy	PRO
Alma Mater Studiorum Università di Bologna (UNIBO)	Italy	PRO
Universitetet i Bergen (UiB)	Norway	PRO
University Court of the University of Aberdeen (UNAB)	United Kingdom	PRO
University of Stirling (UoS)	United Kingdom	PRO
Wageningen University (WU)	The Netherlands	PRO
Koninklijke Nederlandse Akademie van Wetenschappen (KNAW)	The Netherlands	PRO

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Private Research and Industry partners:

Partner	Location	Type
AZTI-Tecnalia (AZTI)	Spain	PRI
Skretting Aquaculture Research Centre AS (SKRET)	Norway	ENT
INRA Transfert (IT)	France	ENT
Panos Christofilogiannis-Ioannatavla O.E .(AQUARK)	Greece	SME
Vertebrate Antibodies Limited (VAL)	United Kingdom	SME
Andromeda Group (ANDRO)	Greece	ENT
Acquazzurra (AA)	Italy	SME
ZF-screens BV (ZF-screens)	The Netherlands	SME
W42 GmbH Industrial Biotechnology (W42)	Germany	SME
Inmunología y Genética Aplicada S.A. (INGENASA)	Spain	SME
Stiftelsen Industrilaboratoriet (ILAB)	Norway	PRI
AquaTT UETP Ltd (AQUATT)	Ireland	SME

Industry Forum

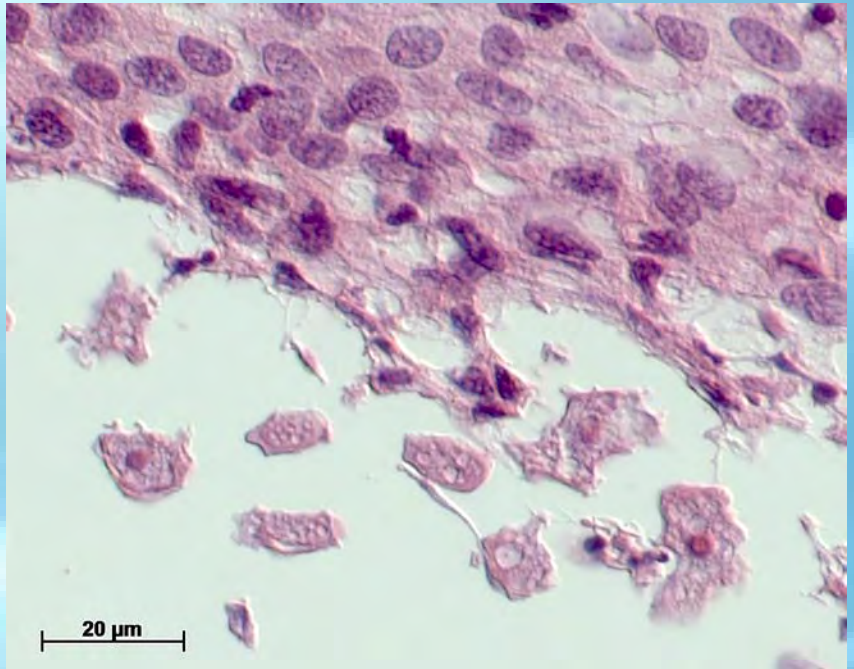
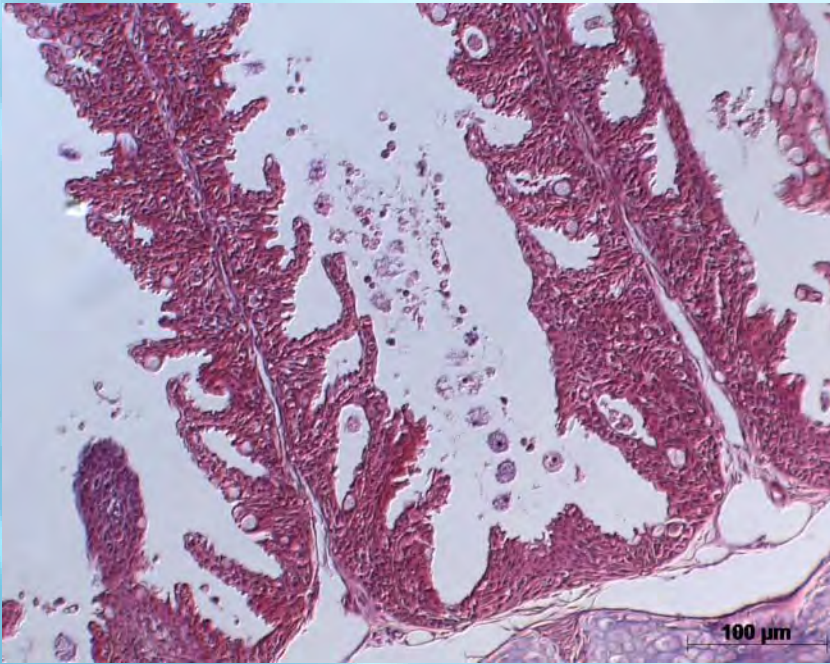
Name	Institution	Country
European and international agencies		
EAFP	European Association of Fish Pathologists	EU
EATiP	European Aquaculture Technology and Innovation Platform	EU
NACEE	Network of Aquaculture Centers in Central-Eastern Europe	EU
National organisations		
API	Italian Association of Fish Farmers	Italy
APROMAR	Spanish Association of Marine Aquaculture Producers	Spain
FGM	Federation of Greek Maricultures	Greece
MASZ	Hungarian Aquaculture Association	Hungary
SSPO	Scottish Salmon Producers' Organisation	UK
DA	Organisation of Danish Aquaculture	DK
Industry		
MSD	MSD Animal Health (pharmaceutical company, vaccines)	NL
TVTL	Test Valley Trout Limited (English trout farm)	UK
TF	Trafalgar Fisheries (English trout farm)	UK

Parasites targeted

Parasite group	Parasite species	Fish	Disease
Crustaceans	<i>Lepeophtheirus salmonis</i> , <i>Caligus</i> spp.	AS	Sea lice infection
	<i>Ceratomyxa oestroides</i> , Caligidae	ESB, GSB	Isopod and sea lice infections
Monogeneans	<i>Sparicotyle chrysophrii</i>	GSB	Gill fluke
Myxozoans	<i>Tetracapsuloides bryosalmonae</i>	RBT	PKD
	<i>Enteromyxum leei</i>	GSB	Knife syndrome
	<i>Enteromyxum scophthalmi</i>	TB	Sunken head syndrome
	<i>Sphaerospora molnari</i>	CC	Gill sphaerosporosis
	<i>Thelohanellus kitauae</i> *	CC	Intestinal giant-cystic disease
Microsporidians	<i>Enterosporea nucleophila</i> * ^[5]	GSB	Emaciative syndrome
Ciliates	<i>Ichthyophthirius multifiliis</i>	RBT, CC	Whitespot disease
	<i>Philasterides dicentrarchi</i>	TB	Scuticociliatosis
Dinoflagellates	<i>Amyloodinium ocellatum</i>	ESB	Velvet disease
Amoebae	<i>Paramoeba perurans</i>	AS	AGD
Oomycetes	<i>Saprolegnia parasitica</i>	AS, RBT	Saprolegniasis
Zoonotic helminths	Anisakidae, Opisthorchidae, Diphyllbothriidae	All	Anisakiasis, Opisthorchiasis, Diphyllbothriasis, allergy (in humans)

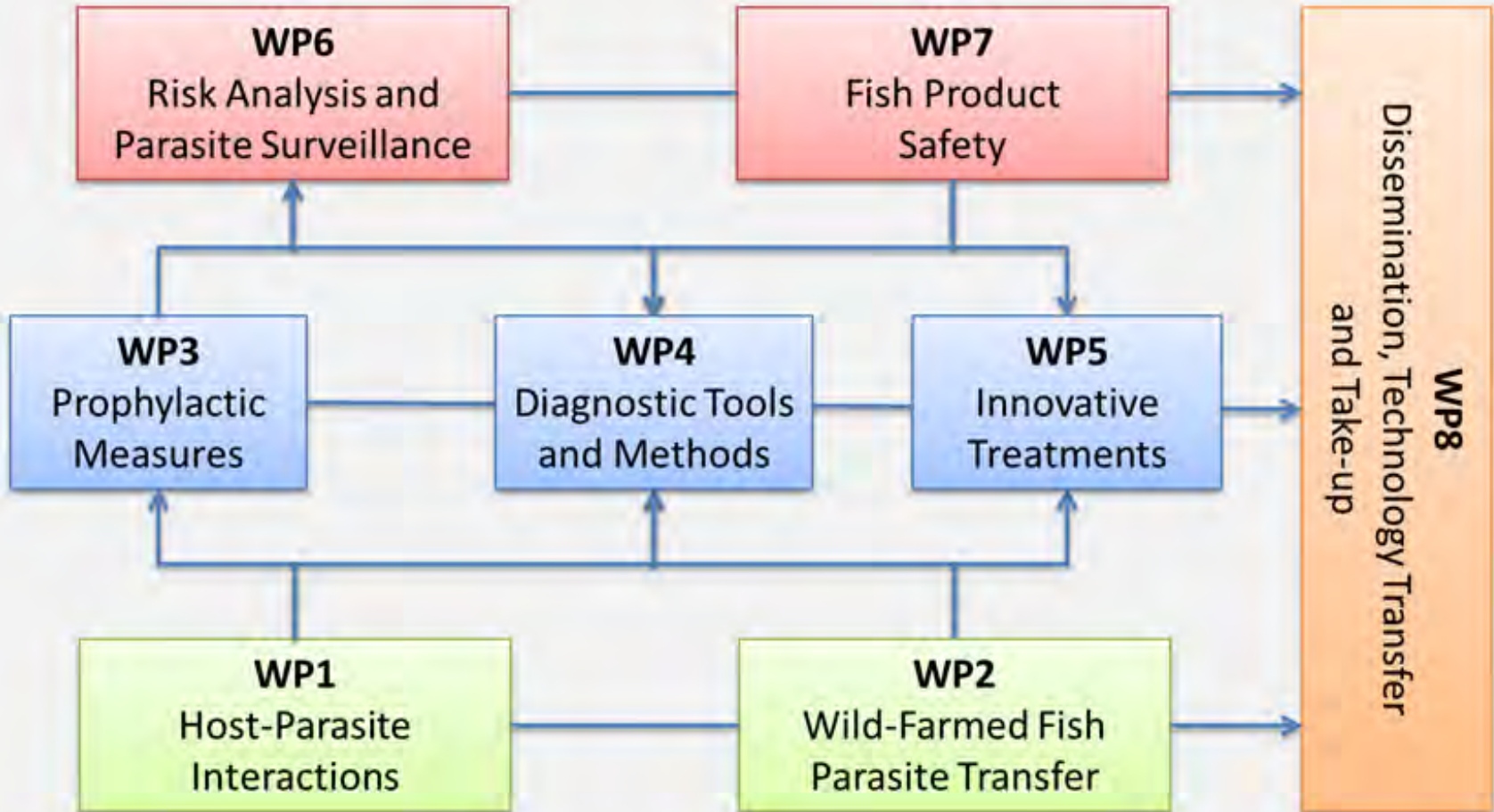
Abbreviations: AS = Atlantic salmon (*Salmo salar*); CC = common carp (*Cyprinus carpio*), ESB = European sea bass (*Dicentrarchus labrax*), GSB = gilthead sea bream (*Sparus aurata*). RBT= rainbow trout (*Onchorhynchus mykiss*), TB = turbot (*Psetta maxima*). * Emerging or exotic parasites.

Paramoeba perurans



Work packages

WP9: Coordination and Management



Work package descriptions

WP1	Host-parasite interactions: Study transcriptomes and determine key genes (NGS); Proteomics to determine key proteins of parasites and their hosts. Use data to identify potential drug and/or vaccine targets and develop diagnostic tests
WP2	Wild-farmed fish parasite transfer: Develop necessary molecular tools and collect data to help provide a basis for better/novel zooprophyllactic strategies
WP3	Prophylaxis: Vaccine development and testing at lab and field trials and development of immunostimulatory feeds with <i>in vitro</i> tests and farm trials
WP4	Diagnostics: Lab tests with analytical optimisation; Reference diagnostic tests, validated methods in ringtests; Rapid on-site assessment, point-of care kits
WP5	Innovative treatments: Rapid to implement alternative treatments; Water- and fish rearing unit treatments; Optimised use of predator fish; Newly identified reagents for parasite treatment; Targeted treatments/immunotherapy
WP6	Risk analysis and surveillance: Biosecurity and IPMS; Tools for assessing economics of alternative control strategies; Future risks and sector level solutions and future challenges; Deposition of parasite samples and metadata in Biobank
WP7	Fish product safety: On-site detection of presence of zoonotic parasites based on validated/calibrated detection methods; Establishment of a Voluntary Control System; Good Practice Handbook for parasite-free culture
WP8	Dissemination, technology transfer and take-up
WP9	Coordination and Management

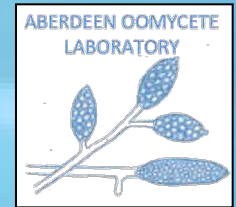
Summary

This project will provide a focus for joint European work on parasites of farmed fish and should stimulate progress towards control of a range of key pathogens across a range of host species

Tools and resources provided by this project should assist other researchers in their work on the same or related parasites



**Institute for Veterinary
Medical Research**
Centre for Agricultural Research
Hungarian Academy of Sciences



**Thank you for
your attention**



INGENASA

