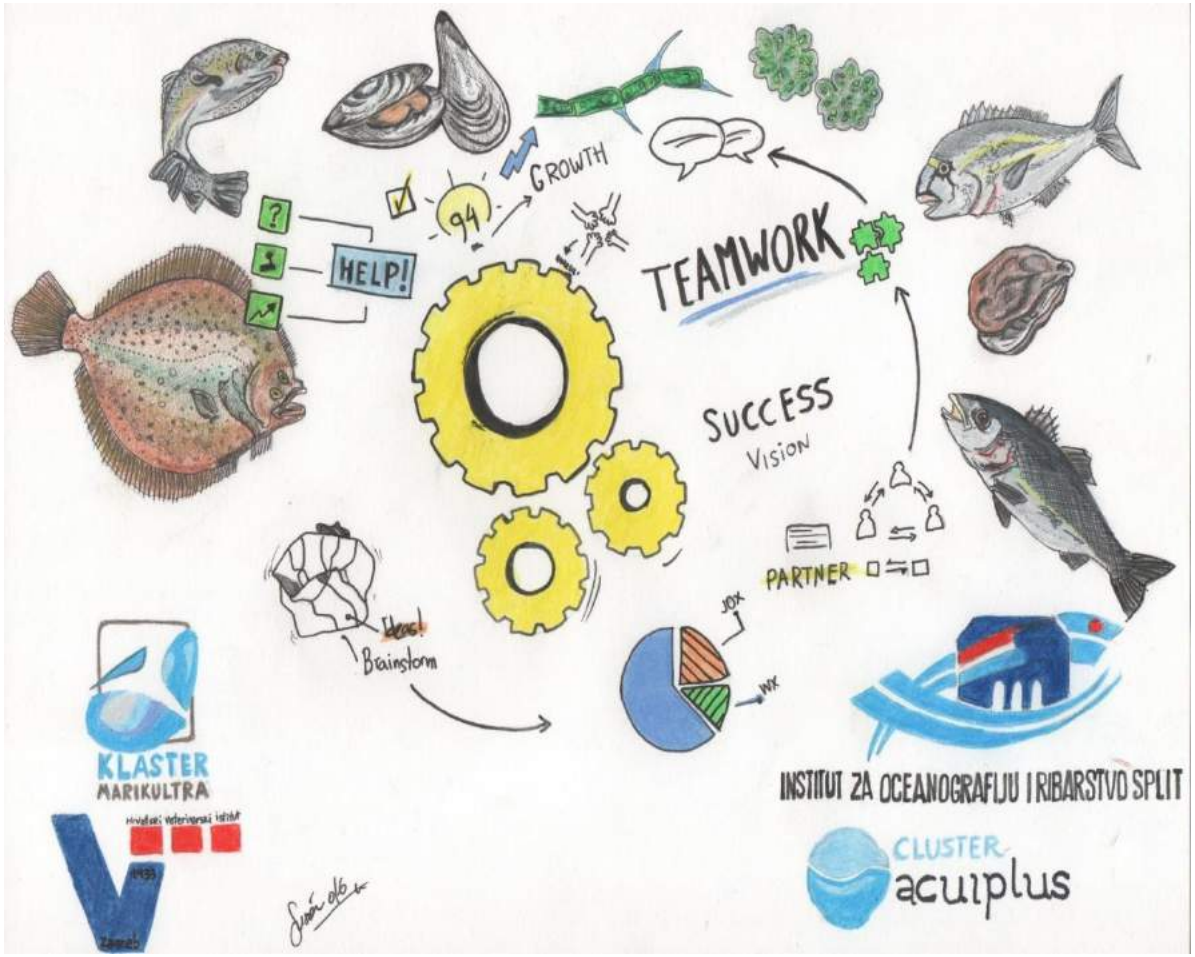
IRTA
RESEARCH & TECHNOLOGY
FOOD & AGRICULTURE

"WE SHARE OUR SCIENCE TO FEED THE FUTURE"

WWW.IRTA.ES

Oriented R&D for the Industry.
Dolors Furones



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RECERCA I TECNOLOGIA AGROALIMENTÀRIES

IRTA RESEARCH & TECHNOLOGY FOOD & AGRICULTURE

ANIMAL PRODUCTION

FOOD INDUSTRY

PLANT PRODUCTION

ENVIRONMENT AND GLOBAL CHANGE

IRTA ECONOMICS

A public company of the Government of Catalonia, linked to the Department of Agriculture, Food and Rural Action (DAR), subject to private law.

“To contribute to the modernization, competitiveness and sustainable development of agriculture, food and aquaculture sectors, the supply of healthy foods and quality for consumers, improving the welfare of the population.”

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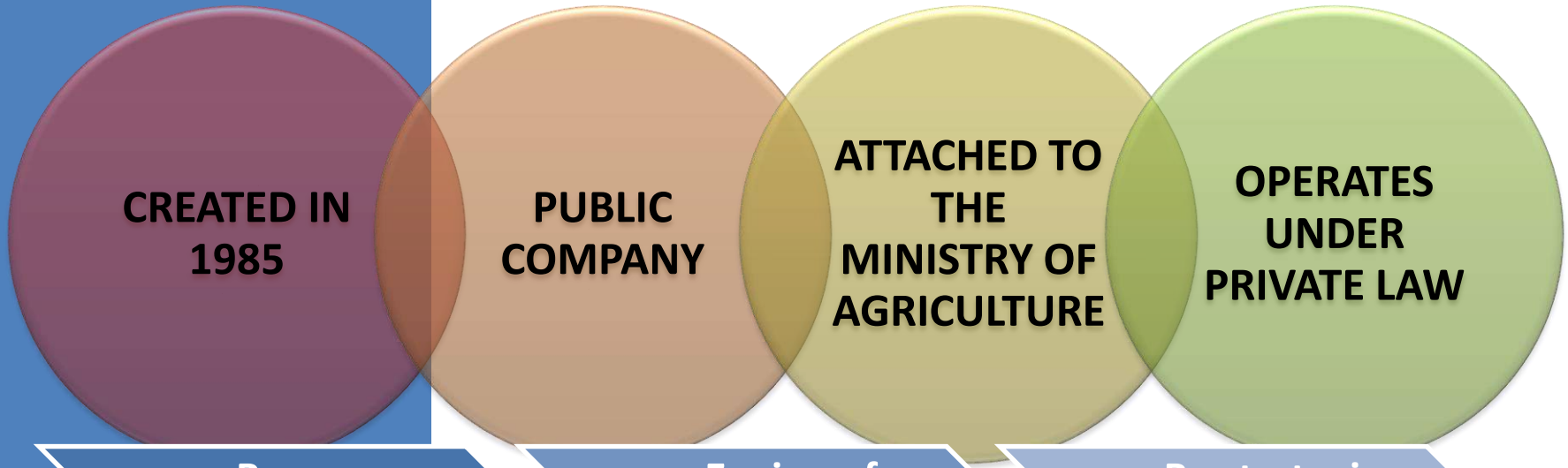
RESEARCH & TECHNOLOGY
FOOD & AGRICULTURE



Become Scientific and technological reference

Engine of innovation and technology transfer

Be strategic partner of the agrifood industry

RESEARCH +DEVELOPMENT → CONTRACTUAL RESEARCH → TECHNOLOGY TRANSFER → TECHNICAL ASSISTANCE AND TRAINING

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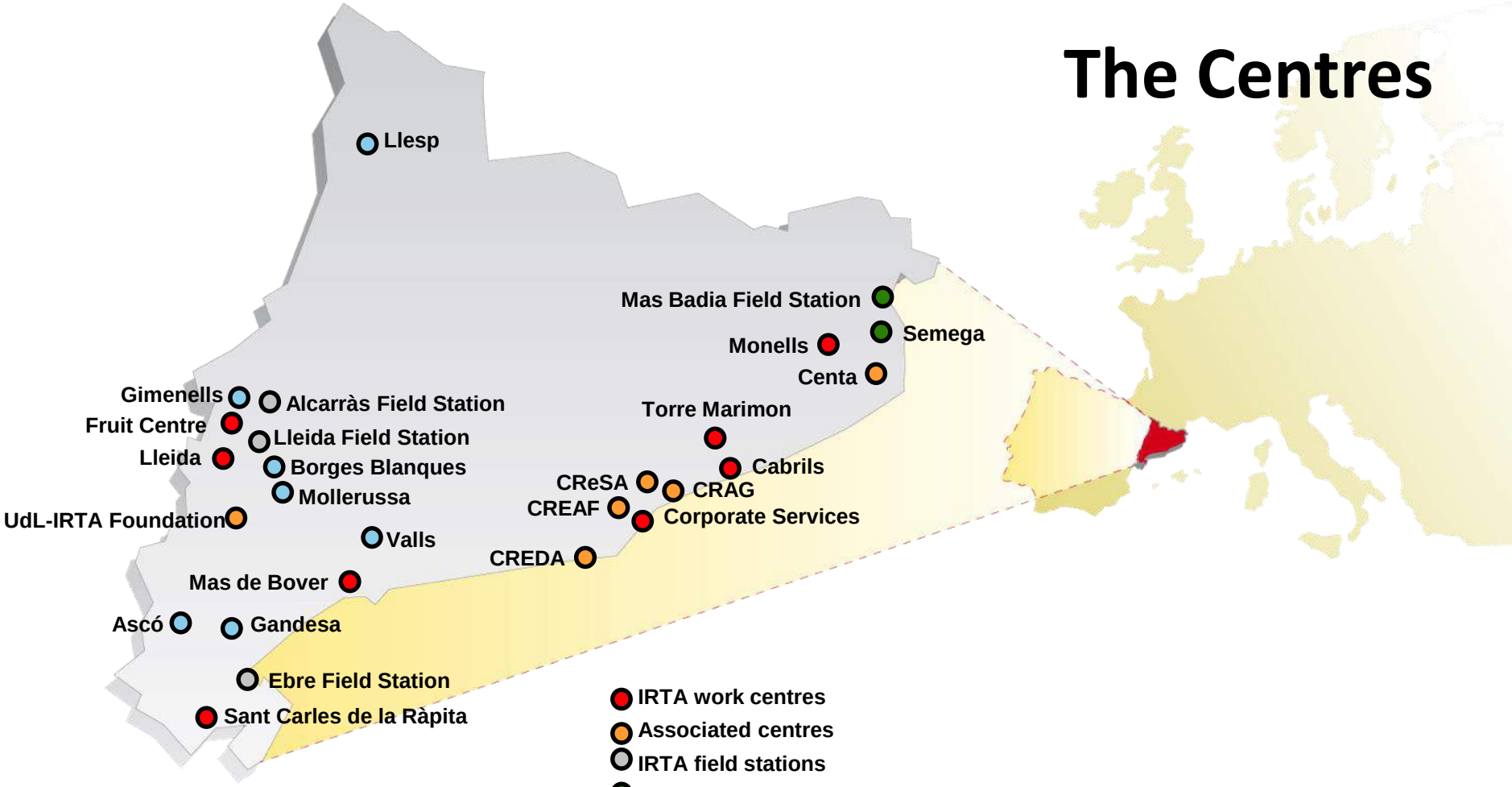
The Centres



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IRTA Sant Carles de la Ràpita
In the heart of the Ebro Delta

Multifunctional platform in aquaculture and aquatic ecosystems

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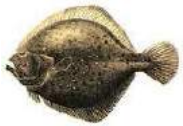


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RESEARCH ACTIVITIES	END USERS
Marine Environmental Survey • Food safety in aquaculture products. • Studies on harmful microalgae (population dynamics, taxonomy, cultures, toxinic production) • Isolation of toxins and substances that are biological active (chromatography, biosensors, cytotoxicity) • Contaminants • Coastal Oceanography.	• Shellfish producers • Consumers and retailers • Human health agencies
Aquatic cultures • Genetics and Reproduction • Larval culture and Nutrition • Aquatic Health	• Consumers and retailers • Feed and additive producers • Fish and shellfish farmers • Aquatic animal health agencies and companies • Conservationists bodies
Aquatic Ecosystems • Floods and pulses of water, sediments and nutrients. • Structure and dynamics of habitats and populations. • Biogeochemical cycles. • Anthropogenic impacts	• Citizens • Environmental agencies • Conservationists bodies

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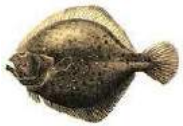
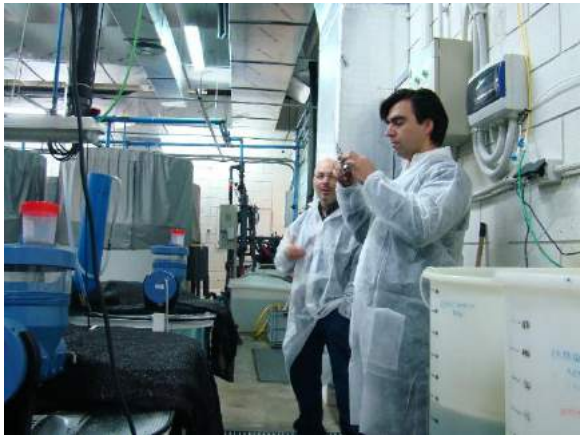



Facilities



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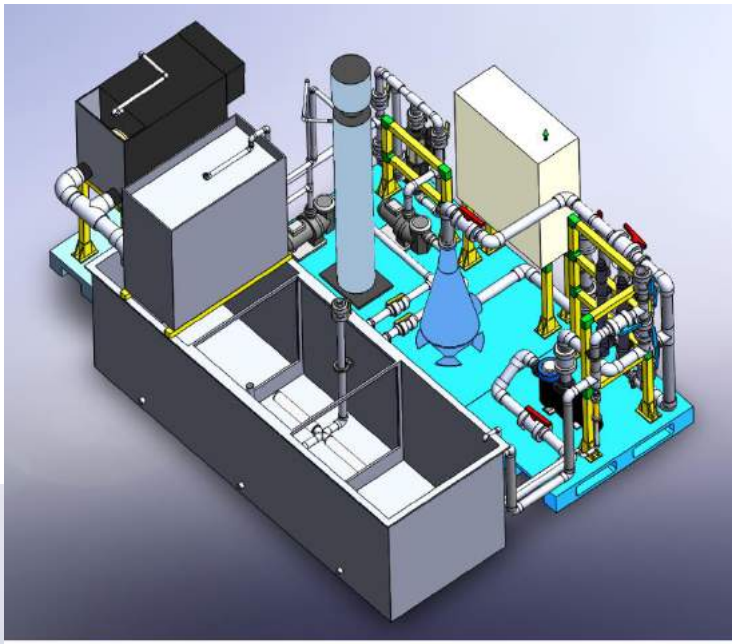
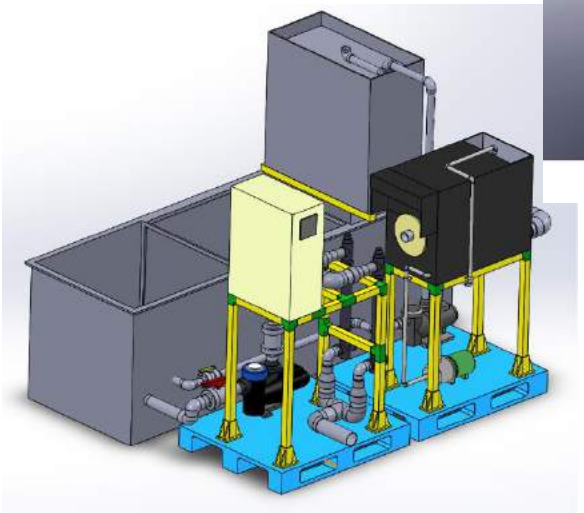
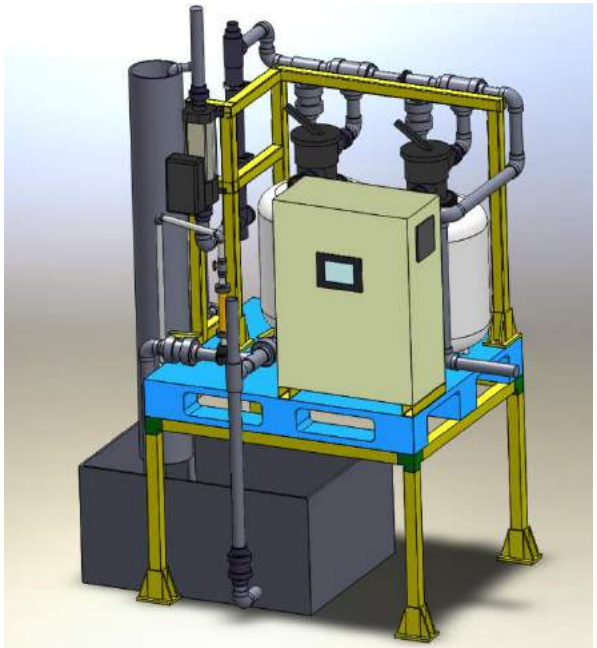
Research quality standard conditions



IRTAmar®





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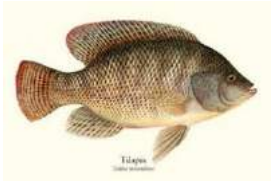
AQUACULTURE PROGRAM Target species

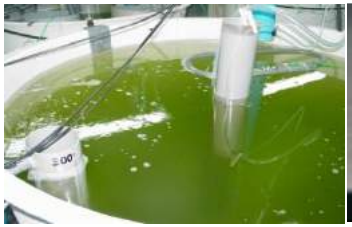
				
Sparus aurata	*Dicentrarchus labrax*	*Solea senegalensis*	*Argyrosomus regius*	*Thunnus thynnus*
				
Salmo salar	*Orcorhynchus mykiss*	*Oreochromis niloticus*	*Anguilla anguilla*	*Acipenser oxyrinchus oxyrinchus*

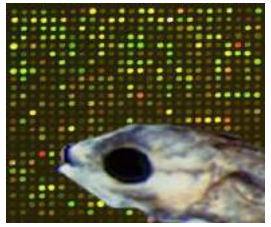
Reproduction

Larval rearing

Nutrition

Stock enhancement



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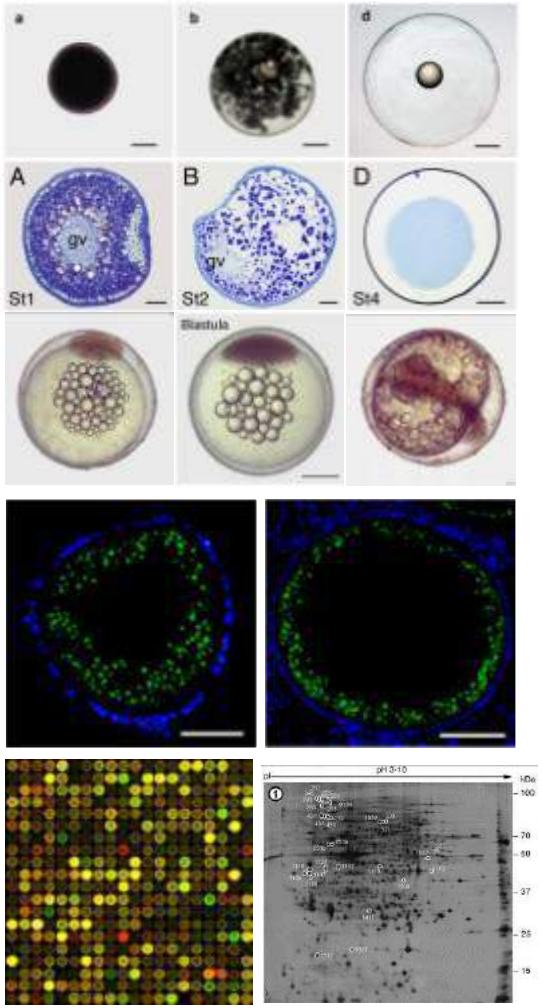
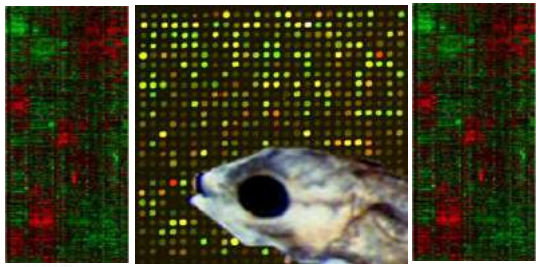
Fish reproduction



Research Topics of the Area

- Chemical communication and spawning behaviour
- Endocrinology and control of fish reproduction
- Broodstock nutrition
- Genetic selection of cultured fish
- Cell biology of fish gametes
- Preservation of fish gametes and embryos
- Development of genomics and proteomics tools
- Genomics of desiccation resistance in fish embryos

Nutritional requirements and impact of nutrition on larval quality



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Assessment of the effects of dietary components on larval performance and establishment of their optimal nutritional requirements.

Feed additives:
immunestimulants, probiotics

Macronutrients:
lipid classes, HUFAs, protein hydrolysates

Micronutrients:
vitamin A, other vitamins, minerals

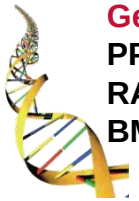
Live prey (enriched rotifers & Artemia)

Microdiets

Nutritional dose-response trials

Organism
Growth
Survival
Phenotype

Cell & Tissue
Skeletogenesis
Digestive function
Immune function
Pigmentation



Gene
PPARs
RARs – RXRs
BMP, IGF, etc

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Effect of alternative diets on juvenile and larval fish performance.

The need for more sustainable diets → considerable changes in diet formulation but effects in important production parameters have yet not been assessed.

Fish oil replacement by vegetable oils in aquaculture diets → changes in fatty acid profiles (such as in n-6 /n-3 PUFA ratios) → physiological and metabolic changes → effects on food intake?

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KBBE-2013-07-GA 603121 DIVERSIFY






www.diversifyfish.eu

Search

HOME PARTNERS SPECIES RESEARCH AREA INTRANET DISSEMINATION BLOG

7FP-KBBE-7-DIVERSIFY

Enhancing the European aquaculture production by removing production bottlenecks of emerging species, producing new products and accessing new markets

Contact Project Coordinator

DIVERSIFY


Summary - objectives

An efficient, sustainable and market-oriented expansion of the EU aquaculture sector based on new fish species and products will reduce the dependence of the EU on imports, reduce the pressure on over-exploited fisheries in the EU and explore new segments and tailor-made products for the EU market. This is the objective of a newly approved Collaborative project named DIVERSIFY, funded by the European Commission (FP7-KBBE-2013, GA 603121).

(read more)

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KBBE-2013-07-GA 603121 DIVERSIFY

Participantes

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Mollusc culture

SPECIES

Pacific oyster (*Crassostrea gigas*)

Flat oyster (*Ostrea edulis*)

Clams (*Ruditapes decussatus*)

Clams (*Ruditapes philippinarum*)

Ribbed Mediterranean Limpet (*Patella ferruginea)*

OBJECTIVES

Close the biological cycle

Improvements in growth, fattening and disease resistance.

Stock enhancement

SECTOR

Generalitat de Cataluña- DAR (Regional government)
Shellfish producers
Spanish Ministry of Agriculture, Fisheries and Food
National Research Council (CSIC)

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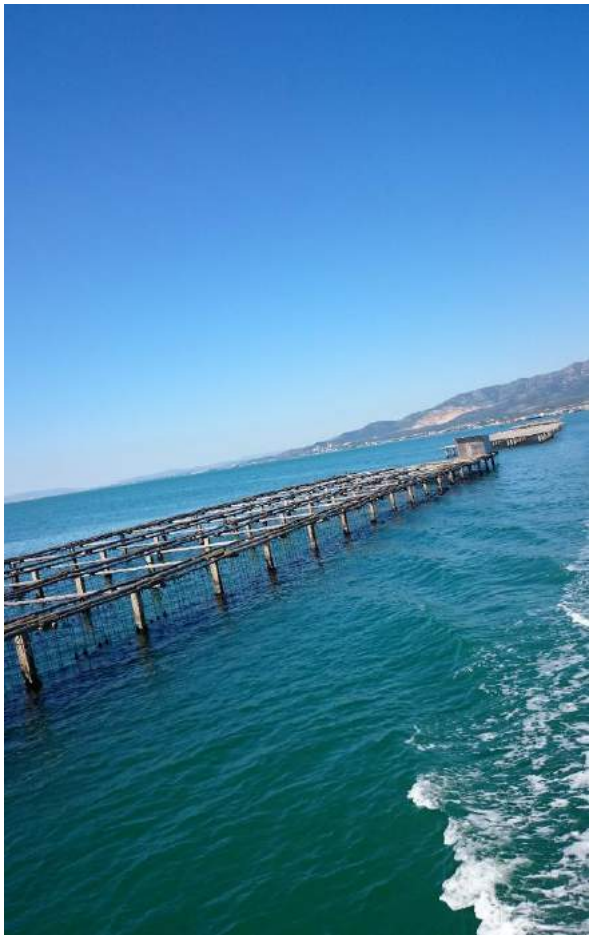
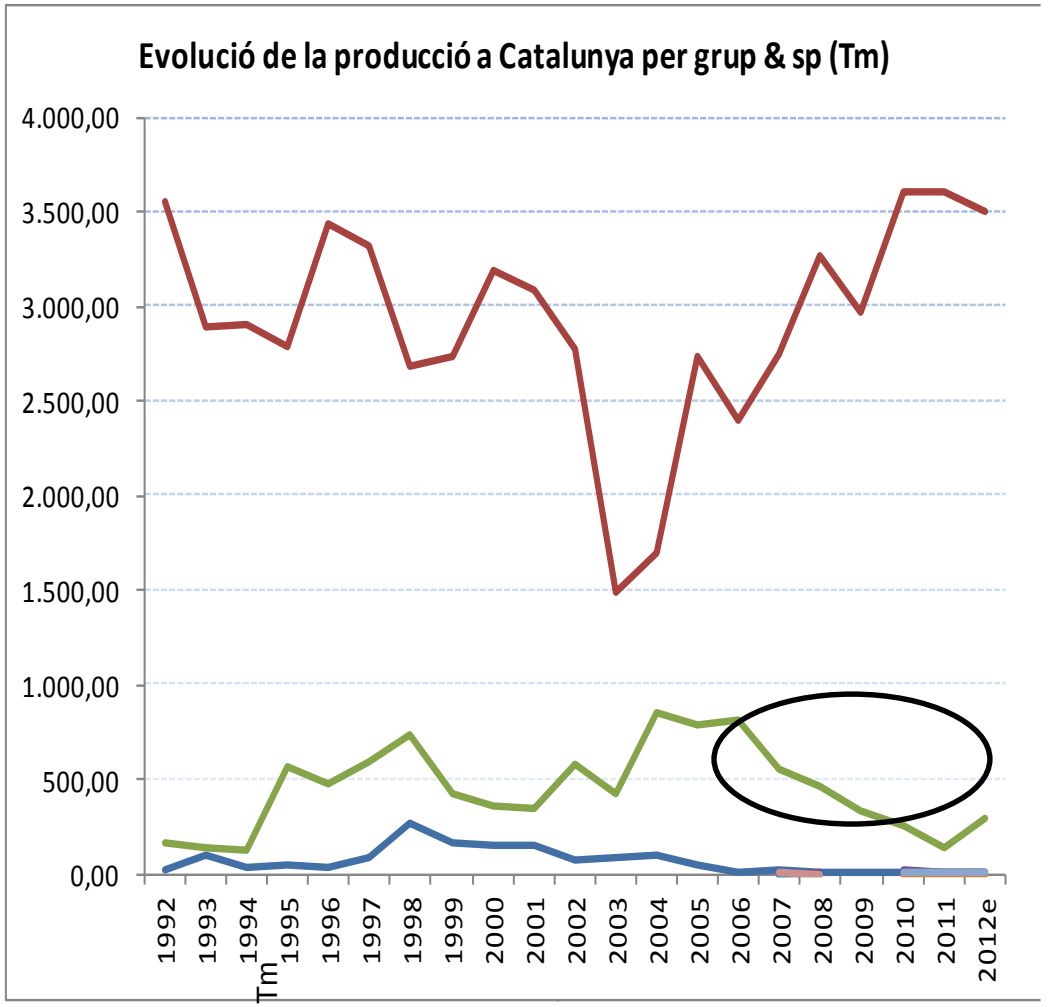
PRODUCTION

Pacific oyster *Crassostrea gigas* in the Ebro Delta





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Mollusc culture

Hatchery & Nursery pilot culture

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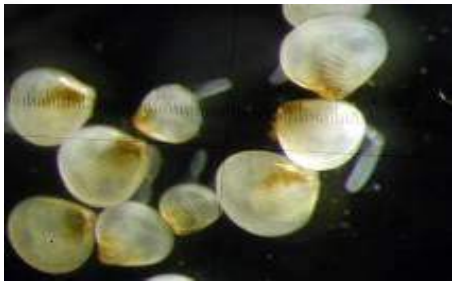
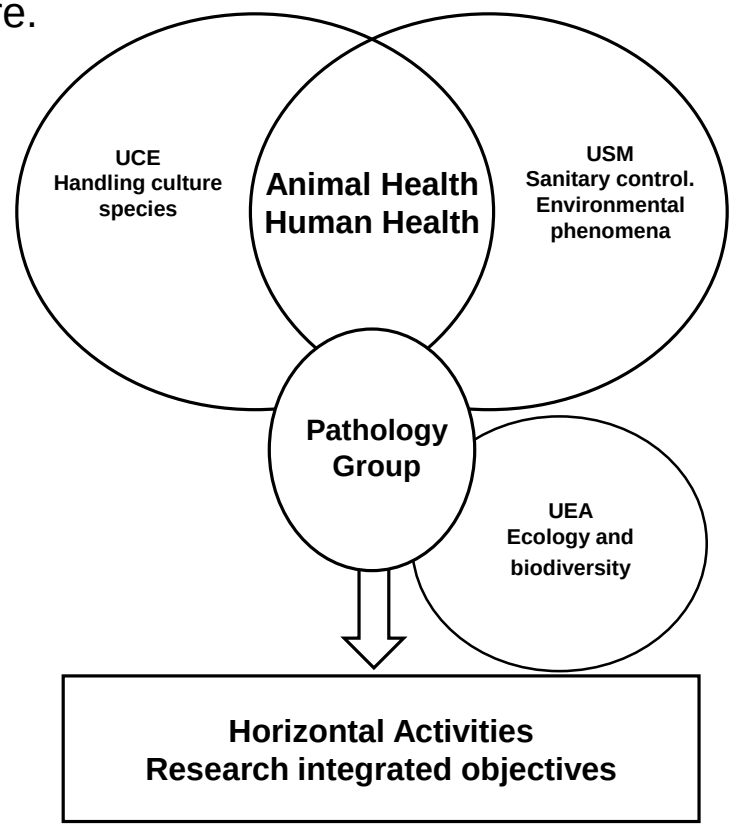
Mollusc culture

AQUATIC HEALTH



General objective

To develop an integrated pathology area focused on animal health problems and public health related to aquaculture.



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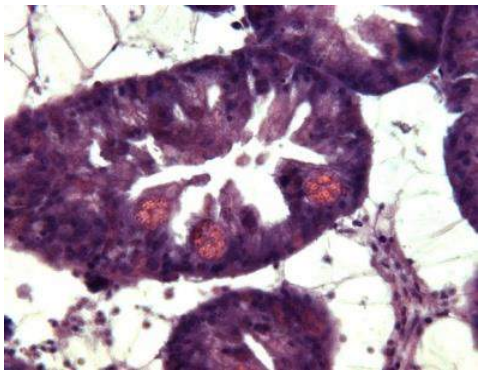
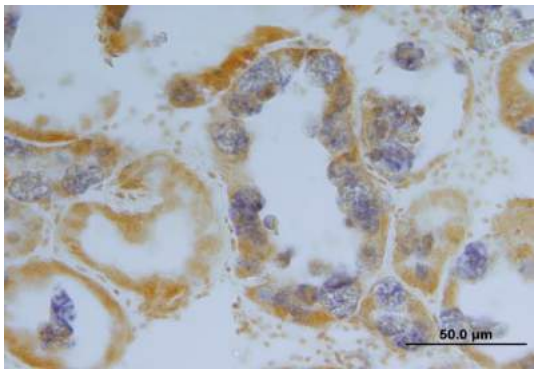
Mollusc health

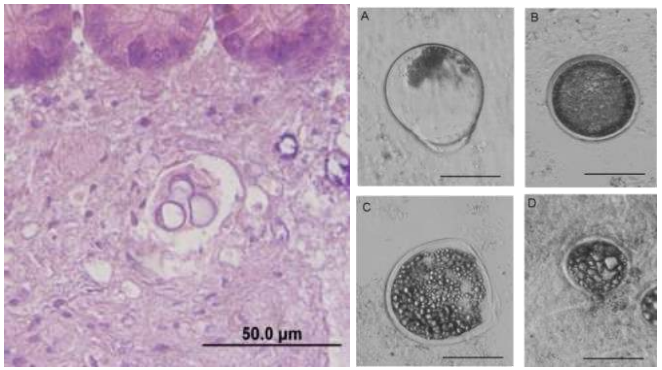
Epidemiology and Diseases

- Epidemiological approaches and risk based assessment.
- Classic and molecular techniques for diagnostic.
- Parasites lifecycle.

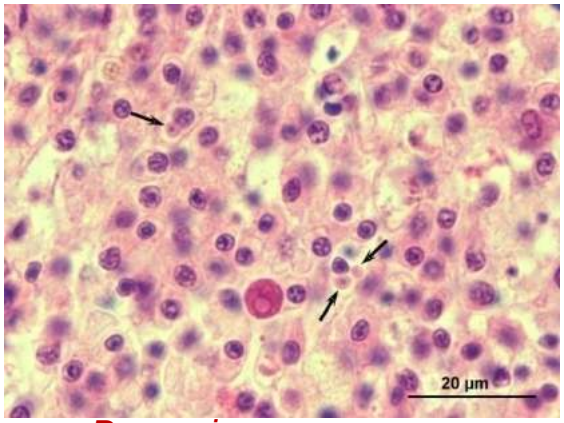




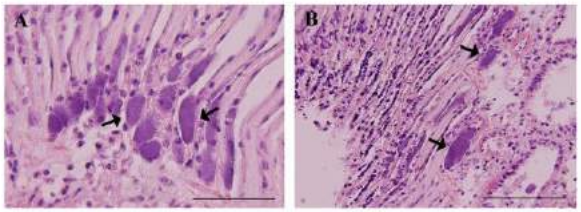
Marteilia sp. in mussels, oysters and cockles



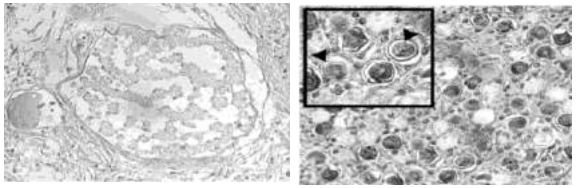
Perkinsus sp. in clams



Bonamia sp. in oysters



Rickettsia-like in smooth clam



Aggregata sp. in Octopus

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Reproduction and larval culture of *Crassostrea gigas*. Herpes-virus resistance/tolerance selection

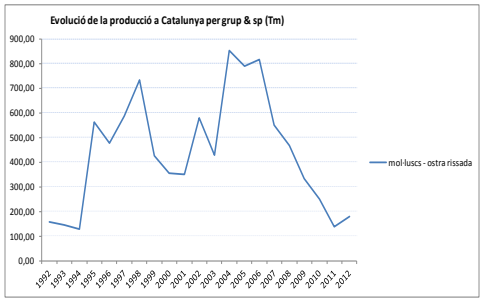
Justification

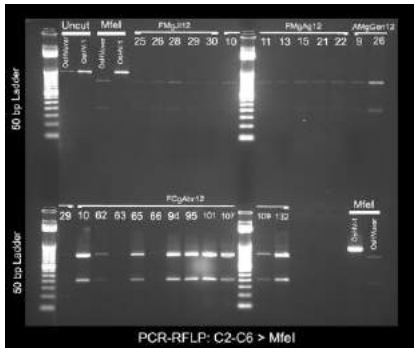
- ✓ *Increase of hatchery supply of spat*
- ✓ *High dependence on imported spats collected in the wild*
- ✓ *High prevalence of Herpesvirus (OsH-v1 μvar)*

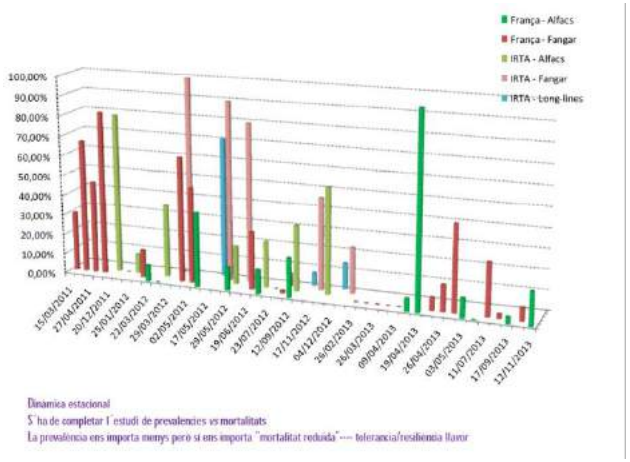
- The virus-free spat produced in IRTA was distributed among the Ebro delta producers

	Data de lliurament	Nombre d'unitats	ubicació
Carlos Bori	23 de maig	1.600	Fangar 30
Cademar	12 d'agost	5.800	Longlines
Explotac. Marinas Fangar	12 d'agost	5.800	Fangar 41
Carlos Bori	12 d'agost	5.800	Fangar 30

- And periodically checked for presence of OsH-v1 μvar
- Spat production allows the producers a better plan for immersion reducing significantly the incidence of the virus







Funding: IRTA, Gov. Catalonia (DAAM)

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- 500 m^2 building
- Air-conditioned
- Sea water
- Fresh Water
- Brackish water
- Heating & cooling systems
- 6 Recirculation aquaculture systems
- Ozone treatment of waste water

1. **Development and application of diagnostic methods**
2. **Epidemiology and risk analysis**
3. **Analysis of gene expression related pathologies**
4. **Challenge room:**
   a. **Experimental infections**
   b. **Study the parasite lifecycle**
   c. **Testing: immune additives, probiotics. vaccines, drugs.**
5. **Fish welfare**

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Work plan

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Field

Descriptive data:

Environment
Oceanography
Phytoplankton Population Dynamics
...

Sample

Food

Water

Microalgae

Culture

Laboratory
analysis & experiments

Microbiology

Chemical pollutants

Toxins

Chemistry

Biochemistry

Cell bioassays

Structure

Functional description of toxins
Mechanisms of action

Development of biosensors

Exposure of marine organisms

Risk assessment
Physiology
Toxicology
...

Bioactive compounds

ECsafe SEAFOOD

SEVENTH FRAMEWORK PROGRAMME

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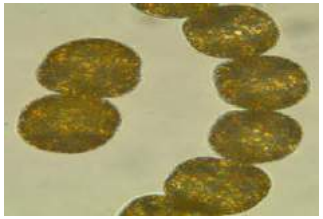
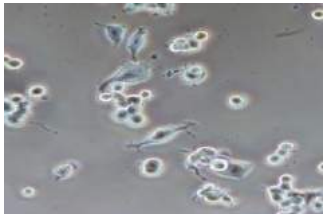
Research



- Microalgae & Aquatic toxins

- Development of detection methods



- Identification & characterization

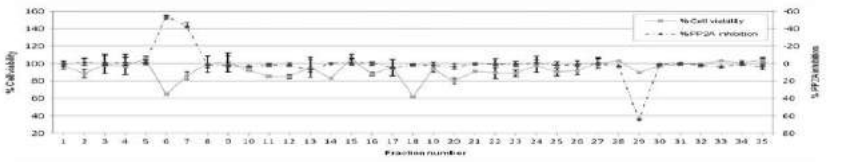
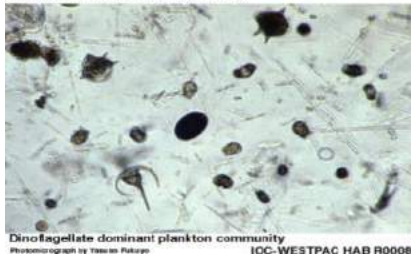
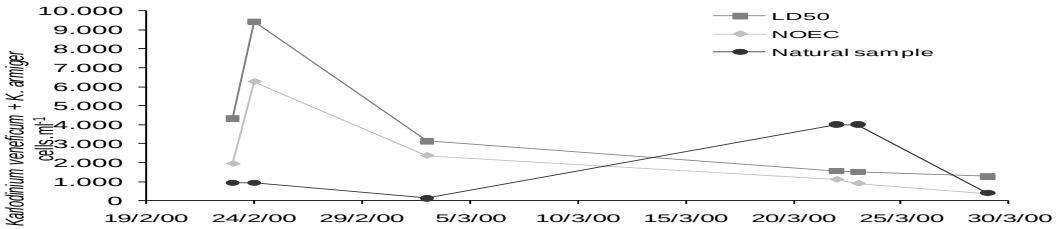


Fig. 2. PP2A inhibition and cell viability percentages obtained after exposure of PP2A and Neuro-2a cells to the fractions of *P. rhathymum* extract.



- Phytoplankton & toxins present in ecosystems



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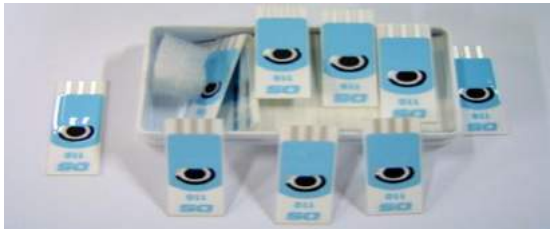
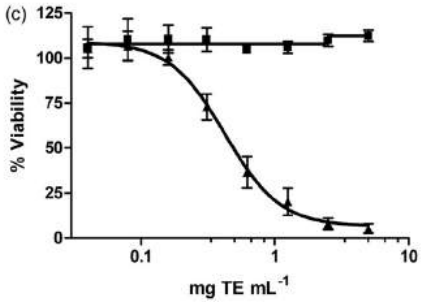
Biochemistry analysis & biosensors development

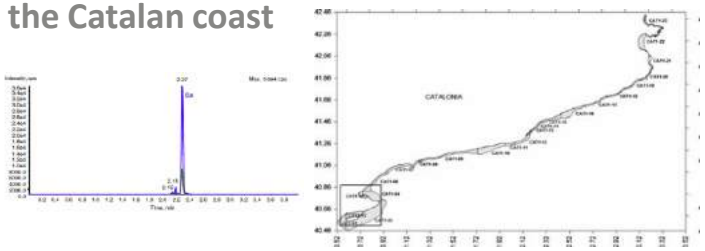


The Marine Monitoring and Food Safety

Ciguatoxin-like toxicity detection in fish from the Canary Islands (*Seriola spp.*) by cell-based assays



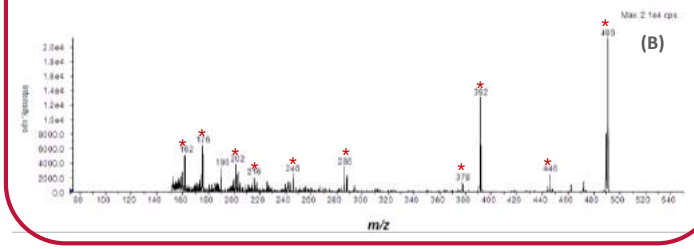
First domoic acid detection in clams from the Catalan coast



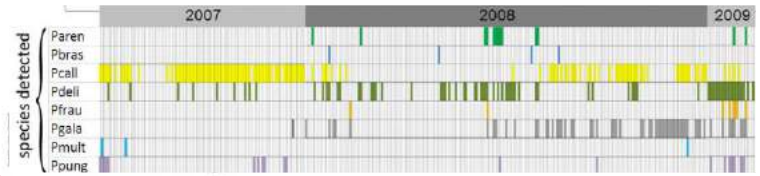
The Marine Monitoring program guarantees safe shellfish, protects human health, supports the aquaculture production sector in Catalonia and preserves the marine environment.

Homoyessotoxin standard production

Discovery of acyl ester metabolites of gymnodimines in shellfish using LC-MS



Molecular probes for *Pseudo-nitzschia spp.*



Magnetic particles as antibody and enzyme supports for biosensor development

Potential integration

Customer

Production and design of experimental feeds
IRTA Mas Bové

Experimental Platform in nutritional trials

IRTA Sant Carles de la Ràpita

Food technology and safety
IRTA Monells

Genetics
IRTA Monells

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Thank you

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