AQUAEXCEL: Building a European network of aquaculture research infrastructures

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Marc Vandeputte
INRA, France
AQUAEXCEL coordinator

AQUAEXCEL – At a glance

- Aquaculture Infrastructures for Excellence in European Fish Research
- FP7, Capacities; RI (11.8M€ budget)
- 17 partners, 10 countries, 23 infrastructures
- March 2011 – February 2015 (4 years)

Main goal: to integrate the key aquaculture research infrastructures in Europe, covering all EU fish culture systems

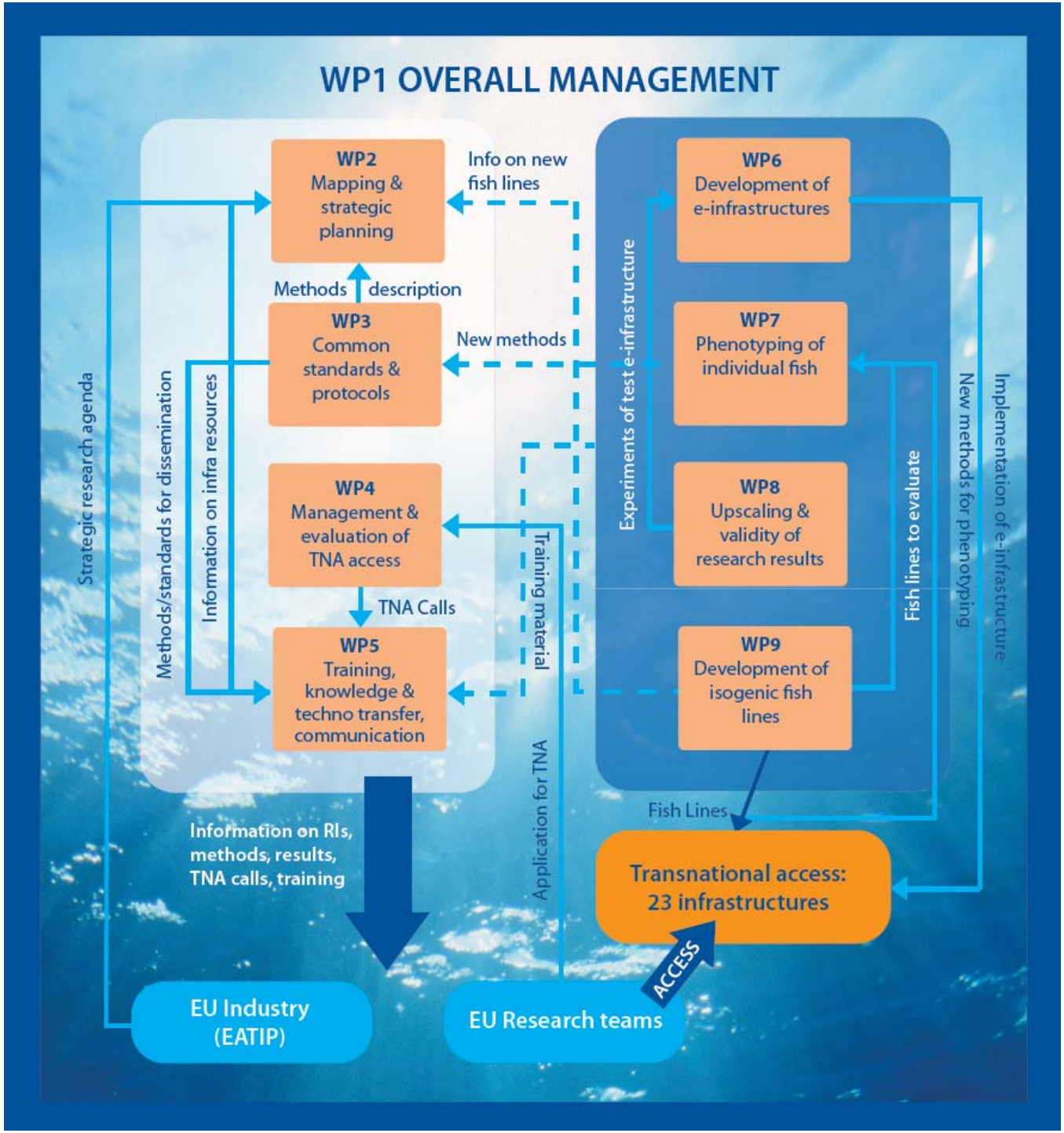
What are ‘RI projects‘?

- **Research infrastructures:** Facilities, resources and related services that are used by the scientific community to conduct top-level research: **the « hardware » for conducting good research**
- **Objectives of EU Infrastructure projects:**
  - Optimise the use and development of the best research infrastructures existing in Europe
  - Ensure the access of research teams from across the EU to these infrastructures
  - Improve the services provided to researchers

Types of activities to achieve these goals

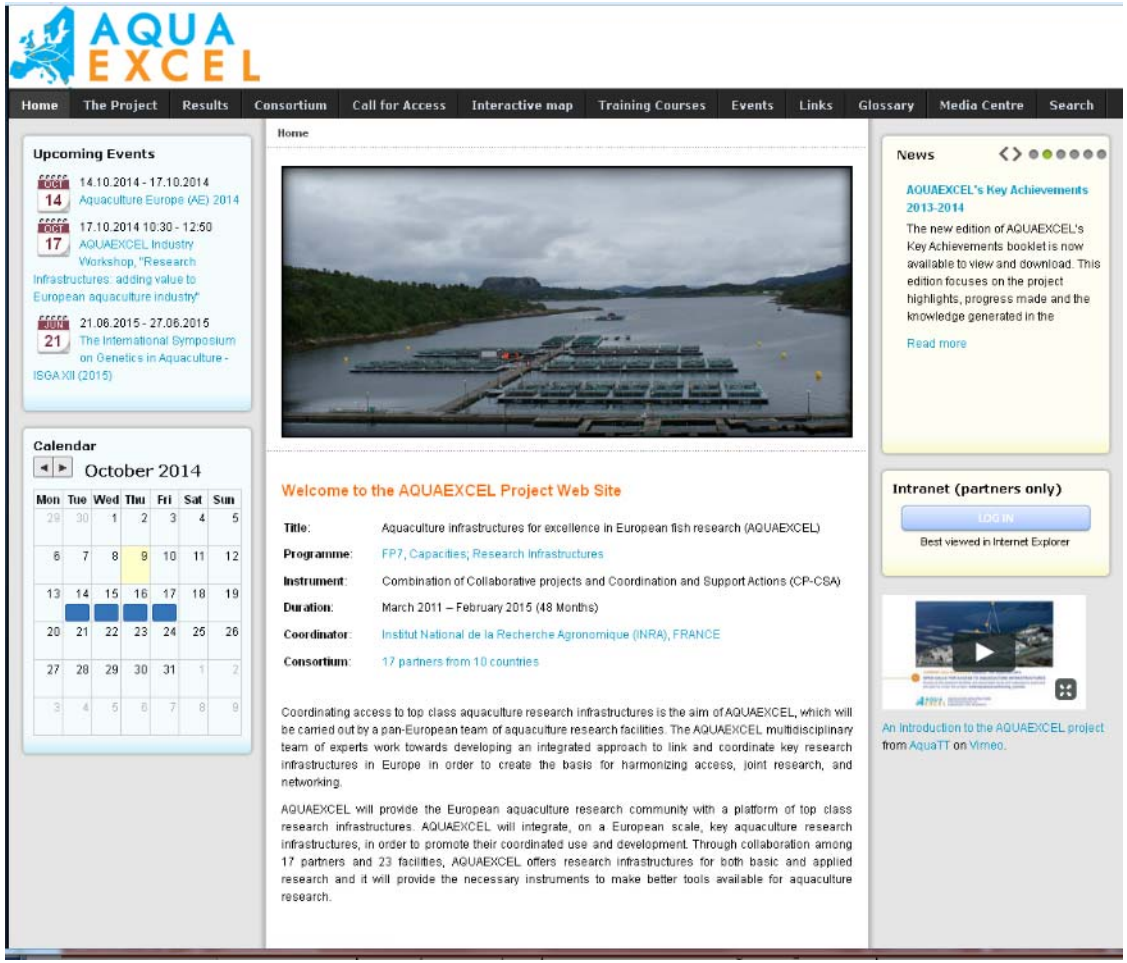
- **Networking Activities (NA):** Co-ordinate partners infrastructures (resource and know-how sharing, communication) and give visibility
- **Transnational Access (TNA):** Give 'free of charge' access to the world-class infrastructures and resources of the consortium
- **Joint Research Activities (JRA):** Joint R&D to improve the services provided by the infrastructures

Objectives & Structure



AQUAEXCEL products

The web site: see all our results at www.aquaexcel.eu



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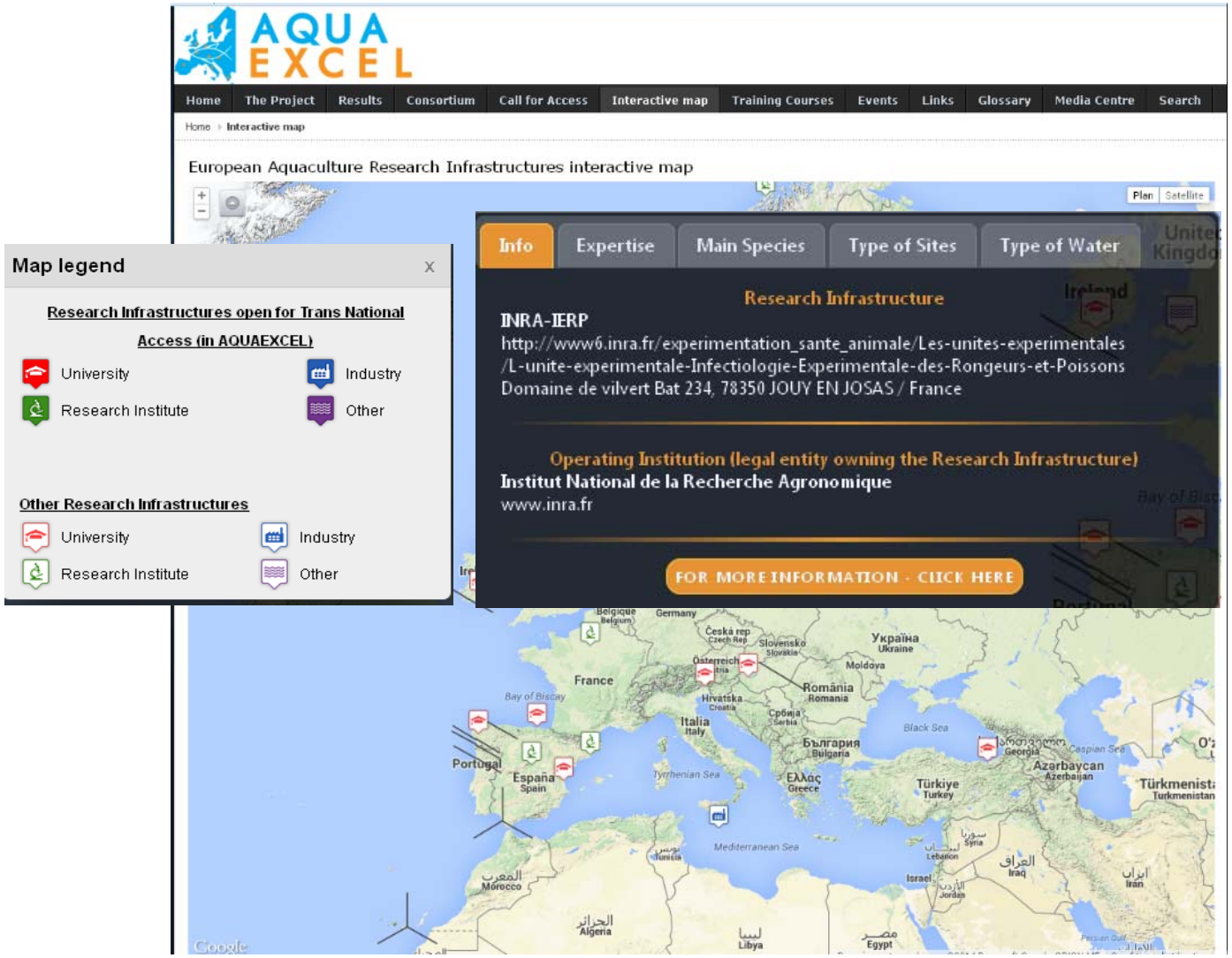
The RI map: identify your partner infrastructure(s)



Currently 108 entries

Interactive menu

Searchable

Detailed information available

You can still register!

AQUAEXCEL products

ATOL / EOL ontologies

http://www.a…gy.com/ …fr/visualisation-fr

+ measurement methods for 63 major traits

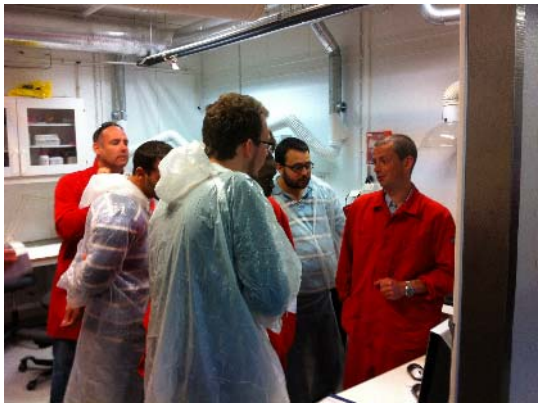
Advanced training courses

RAS technology @ Wageningen

Aquaculture Genomics @ INRA

Chromosome manipulations @ Stirling

New Monitoring Tech @ NTNU



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TRANSNATIONAL ACCESS: all major EU fish species

TRANSNATIONAL ACCESS: all types of infrastructures

Independent selection panel

136 projects submitted ≈ 85 financed

AQUAEXCEL research

IMARES

NOFIMA

SINTEF/ACE

WUR

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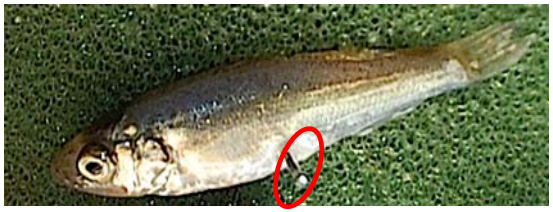
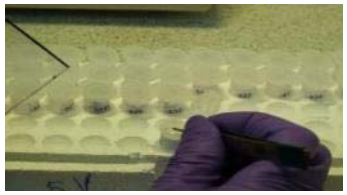
Individual identification in sea bass & sea bream



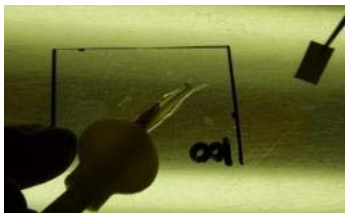
Insertion of the NonaTech tag after piercing the abdominal cavity and on a 400 mg juvenile seabass

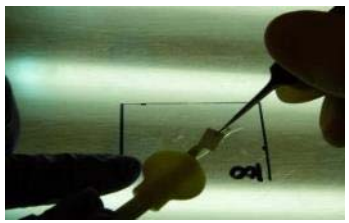
➔Survival OK for BW>400 mg
➔No effect on growth
➔Effect on swimming behaviour (disappears after 42 days)
➔ Reading success >80%

➔Survival OK
➔DNA collected starting 71 dpf (43 mg)
➔DNA quality/quantity OK for routine genotyping for fish> 87 dpf (248 mg)



Cutting of inferior part of caudal fin and storage in ethanol





Sampling mucus & epithelium cells on Whatmann paper and storage in Ependorff at -20° C


Aquaculture 426–427 (2014) 165–171

Contents lists available at ScienceDirect

Aquaculture

journal homepage: www.elsevier.com/locate/aqua-online

Early individual electronic identification of sea bass using RFID microtags: A first example of early phenotyping of sex-related growth

Sébastien Ferrari [a,b], Béatrice Chatain [b,c], Xavier Cousin [a,d], Didier Leguay [a], Alain Vergnet [c], Marie-Odile Vidal [c], Marc Vandeputte [c,e], Marie-Laure Bégout [a,*]

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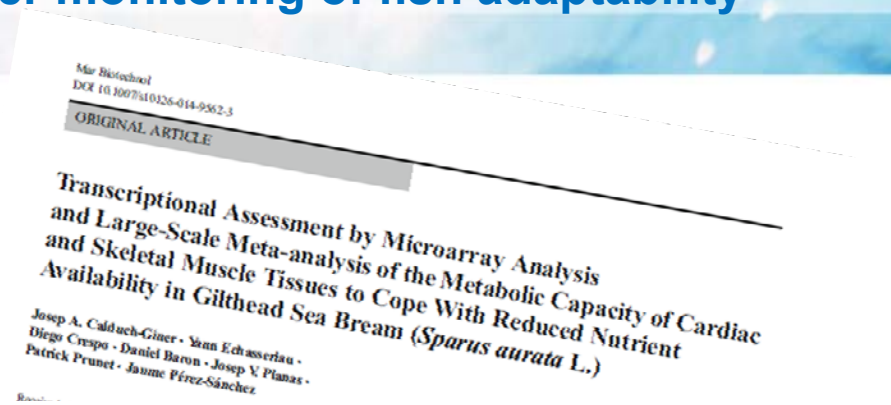
AQUAEXCEL research: better monitoring of fish adaptability


Mar Biotechnol
DOI 10.1007/s10126-014-9562-3
ORIGINAL ARTICLE

Transcriptional Assessment by Microarray Analysis and Large-Scale Meta-analysis of the Metabolic Capacity of Cardiac and Skeletal Muscle Tissues to Cope With Reduced Nutrient Availability in Gilthead Sea Bream (*Sparus aurata* L.)

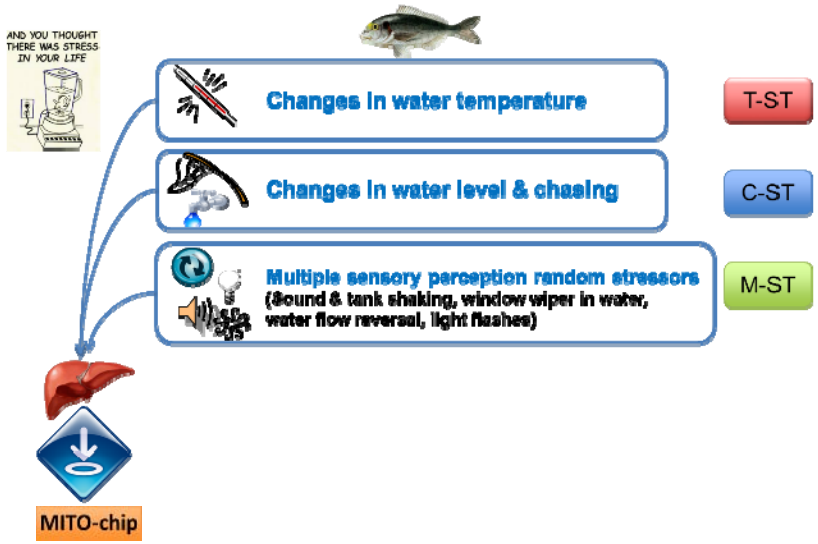
Josep A. Calduch-Giner · Yann Echasseriau · Diego Crespo · Daniel Baron · Josep V. Planas · Patrick Prunet · Jaume Pérez-Sánchez


Comparative Biochemistry and Physiology, Part D 8 (2013) 123–130

Contents lists available at SciVerse ScienceDirect

Comparative Biochemistry and Physiology, Part D

journal homepage: www.elsevier.com/locate/cbpd



Dietary oils mediate cortisol kinetics and the hepatic mRNA expression profile of stress-responsive genes in gilthead sea bream (*Sparus aurata*) exposed to crowding stress. Implications on energy homeostasis and stress susceptibility

Jaume Pérez-Sánchez [a,*], Míriam Borrel [a], Azucena Bermejo-Nogales [a], Laura Benedito-Palos [a], Alfonso Saera-Vila [a], Josep A. Calduch-Giner [a], Sadasivam Kaushik [b]

[a] Nutrigenomics and Fish Growth Endocrinology, Instituto de Acuicultura Torre de la Sal, IATS-CSIC, Castellón, Spain
[b] INRA, UR1067 NuMeA Nutrition, Metabolism Aquaculture, F64310 Saint Pée-sur Nivelle, France


General and Comparative

journal homepage: www.elsevier.com/locate/yg

Metabolic and transcriptional responses of gilthead sea bream (*Sparus aurata* L.) to environmental stress: New insights in fish mitochondrial phenotyping

Azucena Bermejo-Nogales [a], Marit Nederlof [b], Laura Benedito-Palos [a], Gabriel F. Ballester-Lozano [a], Ole Folkedal [c], Rolf Erik Olsen [c], Ariadna Sitjà-Bobadilla [d], Jaume Pérez-Sánchez [a,*]

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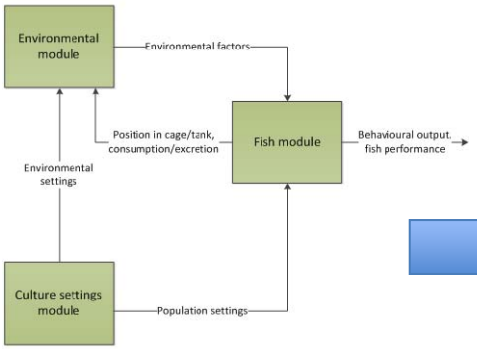
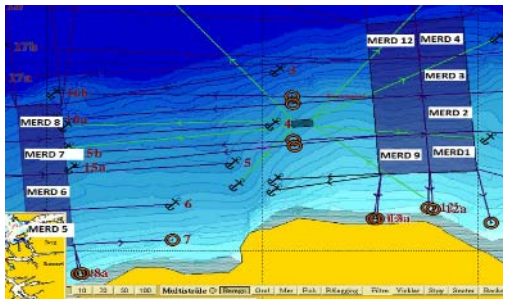
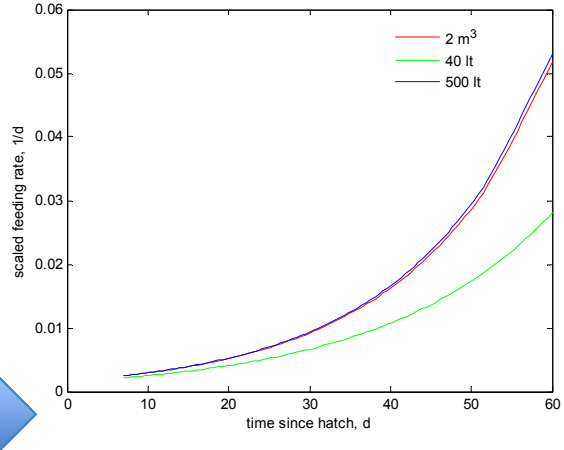
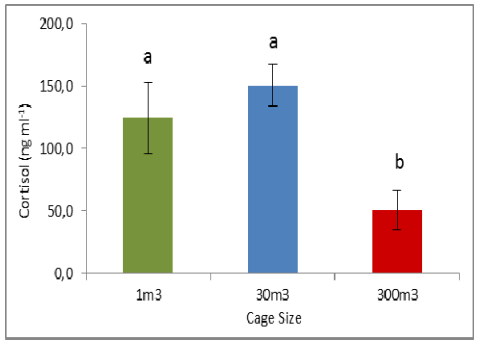
AQUAEXCEL research: Effect of experimental unit size on results









AQUAEXCEL research: Production of isogenic lines

Gynogenesis and androgenesis➔ stable, « pure » lines

➔ reproducible experiments /identification of genes

➔ already available

CONCLUSION

- We made 17 partners work together and share their practices
- Organized cutting edge training courses
- Permitted > 80 research projects in Transnational Access
- Produced essential outputs for more efficient research:
  - Easily accessible information on aquaculture RIs
  - Animal traits and environmental ontologies
  - Phenotyping methods database
  - Remote access protocols to aquaculture Ris
  - Evidenced / modelled effect of experimental unit size
  - Better / non lethal / more informative phenotyping
  - Basis for isogenic lines of sea bass/salmon/carp

➡ For the benefit of the EU aquaculture research community and industry

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WHICH FUTURE ?

Follow-up project AQUAEXCEL^{2020} submitted in September:

- Strong industry involvement via EATIP
- Will finance >170 TNA projects over 5 years (be ready !)
- Organizing data (« the Digital Fish ») with EMBRC & ELIXIR
- Support for industry transfer of the best JRA and TNA outputs
- Virtual aquaculture research infrastructures for *in silico* experiments
- Effects of fish life history on experimental outputs
- Characterization and use of isogenic fihs lines
- Nano-sensors for remote monitoring of experimental fish

The answer in January 2015!

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Would you like to find out more?

AQUAEXCEL INDUSTRY WORKSHOP:

Research Infrastructures: adding value to European aquaculture industry

Friday, 17th October
Kicking off at 10.30am
Room 11 (Exhibition Area)

See you there!

Contact us

Thank you for your attention

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Tel: +334 67 13 04 07

DISCLAIMER

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