



AQUAEXCEL: Building a European network of aquaculture research infrastructures

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**AQUAEXCEL: Building a European network
of aquaculture research infrastructures**

Aquaculture Europe 2014 - San Sebastián

16 October 2014

**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'?

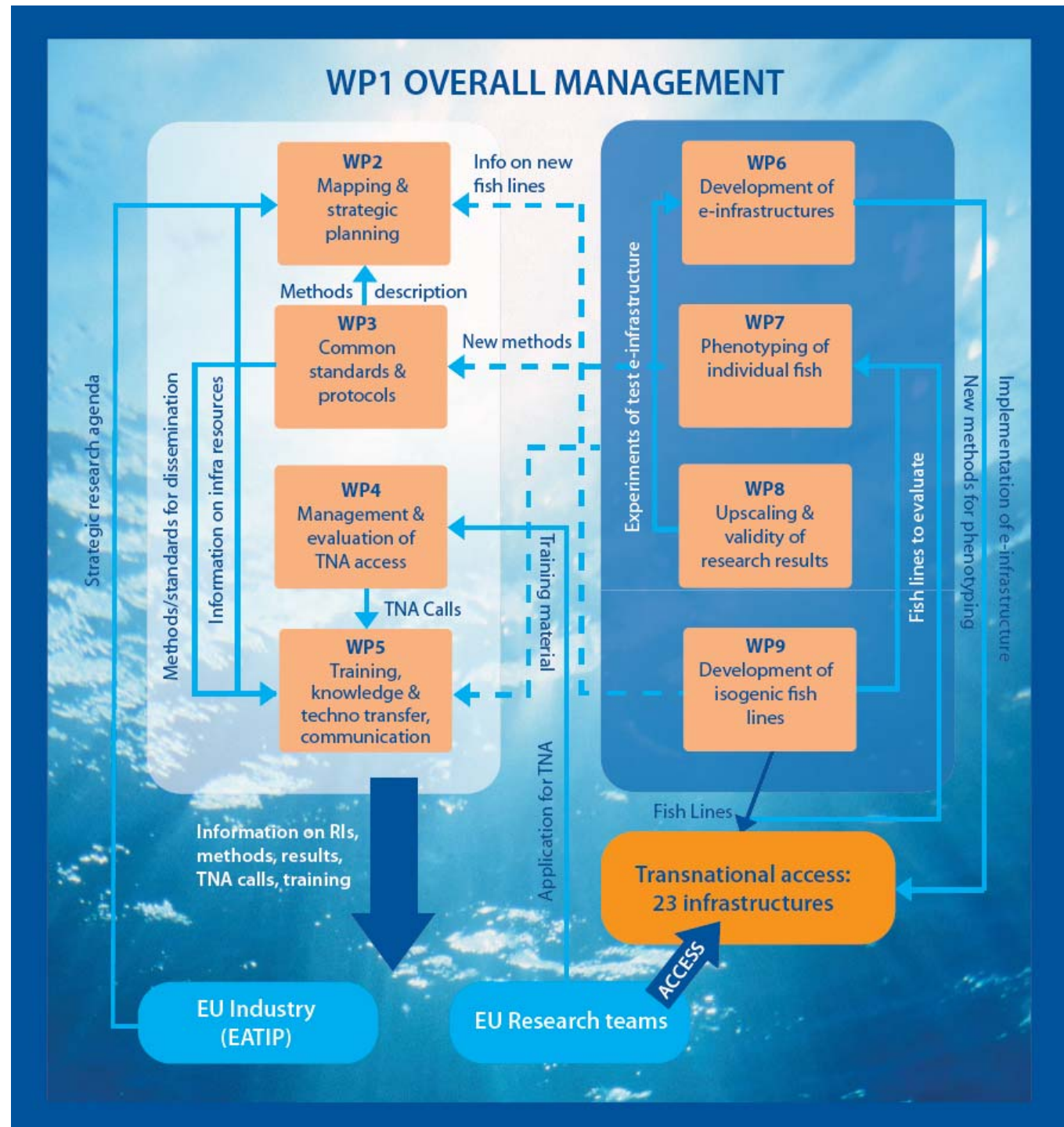
- **Research infrastructures:** Facilities, resources and related services that are used by the scientific community to conduct top-level research: **the « hardware » for conducting good research**
- **Objectives of EU Infrastructure projects:**
 - Optimise the use and development of the best research 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



The screenshot displays the AQUAEXCEL Project Web Site. The header features the AQUAEXCEL logo and a navigation menu with links: Home, The Project, Results, Consortium, Call for Access, Interactive map, Training Courses, Events, Links, Glossary, Media Centre, and Search.

Upcoming Events

- 14.10.2014 - 17.10.2014: Aquaculture Europe (AE) 2014
- 17.10.2014 10:30 - 12:50: AQUAEXCEL Industry Workshop, "Research Infrastructures: adding value to European aquaculture industry"
- 21.06.2015 - 27.06.2015: The International Symposium on Genetics in Aquaculture - ISGA XII (2015)

Calendar

October 2014

Mon	Tue	Wed	Thu	Fri	Sat	Sun
29	30	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	1	2
3	4	5	6	7	8	9

Welcome to the AQUAEXCEL Project Web Site

Title: Aquaculture infrastructures for excellence in European fish research (AQUAEXCEL)

Programme: FP7, Capacities, Research Infrastructures

Instrument: Combination of Collaborative projects and Coordination and Support Actions (CP-CSA)

Duration: March 2011 – February 2015 (48 Months)

Coordinator: Institut National de la Recherche Agronomique (INRA), FRANCE

Consortium: 17 partners from 10 countries

Coordinating access to top class aquaculture research infrastructures is the aim of AQUAEXCEL, which will be carried out by a pan-European team of aquaculture research facilities. The AQUAEXCEL multidisciplinary team of experts work towards developing an integrated approach to link and coordinate key research infrastructures in Europe in order to create the basis for harmonizing access, joint research, and networking.

AQUAEXCEL will provide the European aquaculture research community with a platform of top class research infrastructures. AQUAEXCEL will integrate, on a European scale, key aquaculture research infrastructures, in order to promote their coordinated use and development. Through collaboration among 17 partners and 23 facilities, AQUAEXCEL offers research infrastructures for both basic and applied research and it will provide the necessary instruments to make better tools available for aquaculture research.

News

AQUAEXCEL's Key Achievements 2013-2014

The new edition of AQUAEXCEL's Key Achievements booklet is now available to view and download. This edition focuses on the project highlights, progress made and the knowledge generated in the

[Read more](#)

Intranet (partners only)

[LOG IN](#)

Best viewed in Internet Explorer

An introduction to the AQUAEXCEL project from AquaTT on Vimeo

AQUAEXCEL products

The RI map: identify your partner infrastructure(s)

The screenshot displays the AQUAEXCEL website's interactive map interface. At the top, the AQUAEXCEL logo is visible alongside a navigation menu with links to Home, The Project, Results, Consortium, Call for Access, Interactive map, Training Courses, Events, Links, Glossary, Media Centre, and Search. Below the menu, the page title reads 'European Aquaculture Research Infrastructures interactive map'. A map of Europe is shown with various infrastructure locations marked by icons. A 'Map legend' window is open on the left, detailing the icons for 'Research Infrastructures open for Trans National Access (in AQUAEXCEL)' and 'Other Research Infrastructures'. The legend categories include University, Research Institute, Industry, and Other. A detailed information window for 'INRA-IERP' is overlaid on the map, providing the URL http://www6.inra.fr/experimentation_sante_animale/Les-unites-experimentales/L-unite-experimentale-Infectiologie-Experimentale-des-Rongeurs-et-Poissons, the address 'Domaine de vilvert Bat 234, 78350 JOUY EN JOSAS / France', and the operating institution 'Institut National de la Recherche Agronomique' with the website www.inra.fr. The map itself shows various European countries and their names in multiple languages, with a 'Plan' and 'Satellite' toggle at the top right.

Currently 108 entries

Interactive menu

Searchable

Detailed
information
available

You can still
register!

AQUAEXCEL products

ATOL / FOL ontologies

<http://www.aquaexcel.eu/ontology.com/>

[Link Table 2](#) [Visualisation-fr](#)



The image displays two documents related to the AQUAEXCEL project. The left document is the cover of 'Deliverable 3.2: Best practices & cross-applicability of methods to measure phenotypes'. It features the AQUAEXCEL logo, the European Union flag, and project details including the number 262336 and the Seventh Framework Programme. The right document is a table from the ATOL ontology, specifically 'Link Table 2', which provides detailed information for the trait 'Condition factor' (ATOL:0001653). The table includes fields for identification, definition, measurement methods, materials, units, and research contributions.

Identifiant	Name of Trait:	Definition:	GM6
ATOL:0001653	Condition factor	Indicator of the stoutness of an animal, obtain using the formula $K = (\text{body weight}[\text{g}]) / (\text{body length}[\text{cm}]) \times 100$.	
SIMILAR TO: if it's appropriate, in connection with other <u>parameters number</u>			
MEASUREMENT METHOD: Condition factor = $K = (\text{body weight}[\text{g}]) / (\text{body length}[\text{cm}]) \times 100$ Where body length corresponds to the fork length (ATOL:0001656) and body weight (ATOL:0000351) to the total weight of the fish after draining.			
MATERIAL (biological, reagents & instrumental): A scale (accuracy of 0.1 g) Measuring board (accuracy of 0.1 cm)			
UNIT AND RANGE OF VALUE: Length in cm; weight in gram, the condition factor is around 1 (0.5-3) (no unit)			
PARAMETERS TO MEASURE: Fork length of the fish Body weight of the fish			
BIBLIOGRAPHIC REFERENCES: Nash, R.D.M., Valencia, A.H., Geffen, A.J., 2008. The Origin of Fulton's Condition Factor. Setting the Record Straight. <i>Fisheries</i> 31, 238-250. (http://folk.uib.no/nfag/nfag/preprints/NashRETAL2008Fisheries.pdf).			
SYNONYMS EXACT: Fulton index, condition factor, K			
OTHER ASPECTS TO INCLUDE: Depending on the fin integrity the standard length (ATOL:0001656) could be used instead of the fork length.			
RESEARCHER CONTRIBUTION (and date of the last modification): Åsa Maria Espmark (NOFIMA) Bendik Fyhn Terjesen (NOFIMA) Léa Joret (INRA) Pierre-Yves Le Bail (INRA) Jaume Pérez-Sánchez (CSIC) (20/06/13)			

+ measurement methods for 63 major traits

AQUAEXCEL products

Advanced training courses

RAS technology @ Wageningen



Aquaculture Genomics @ INRA



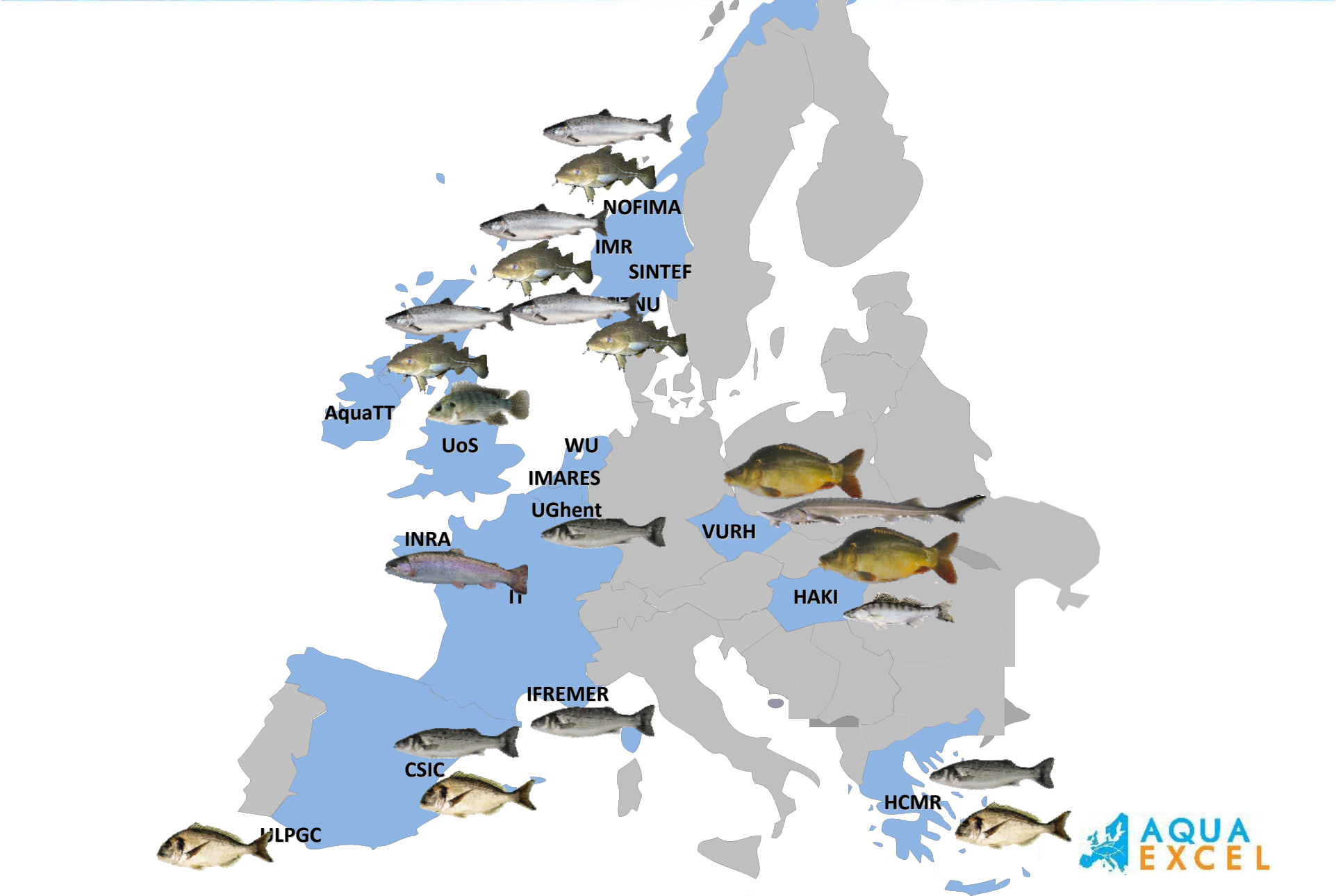
Chromosome manipulations
@ Stirling



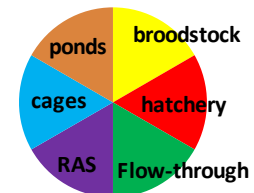
New Monitoring Tech @ NTNU



TRANSNATIONAL ACCESS: all major EU fish species



TRANSNATIONAL ACCESS: all types of infrastructures

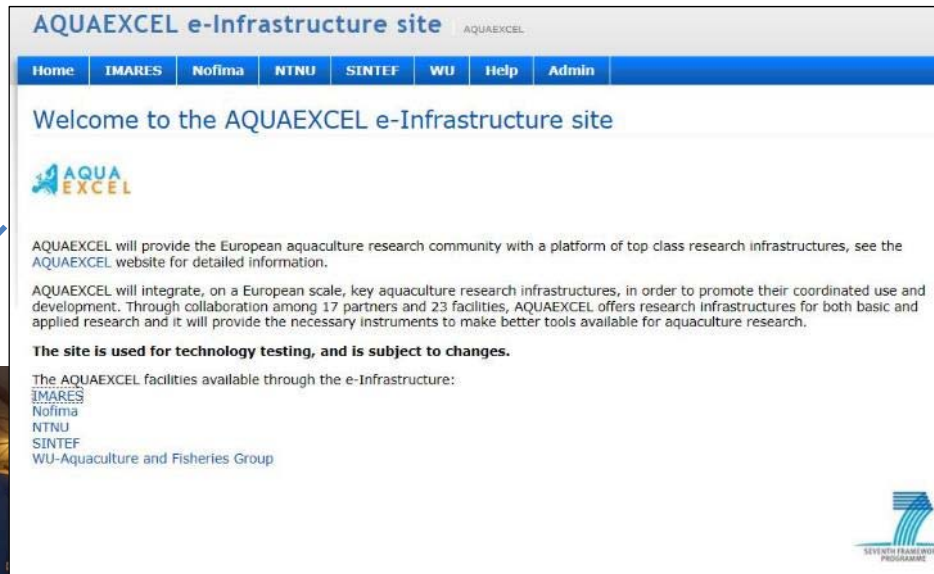


Independent selection panel

136 projects submitted \approx 85 financed



AQUAEXCEL research



IMARES



NOFIMA



SINTEF/ACE



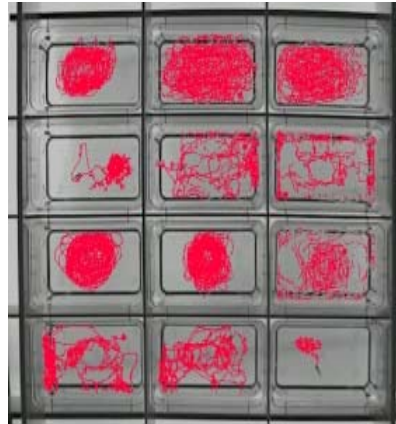
WUR



Individual identification in sea bass & sea bream

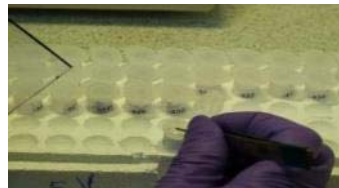


Insertion of the NonaTech tag after piercing the abdominal cavity and on a 400 mg juvenile seabass

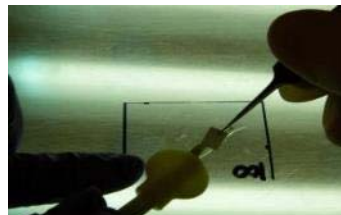
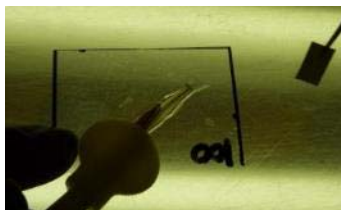


- Survival OK for BW > 400 mg
- No effect on growth
- Effect on swimming behaviour (disappears after 42 days)
- Reading success > 80%

- 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



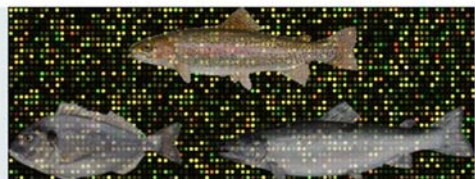
AQUAEXCEL research: better monitoring of fish adaptability

Fish and Chips

Fish transcriptome database

Fish and Chips :

Fish and Chips database gathers public transcriptome data related to fish species in various physiological conditions



Changes in water temperature

T-ST



Changes in water level & chasing

C-ST



Multiple sensory perception random stressors (Sound & tank shaking, window wiper in water, water flow reversal, light flashes)

M-ST



MITO-chip

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. Caldúch-Giner · Shan 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. Caldúch-Giner ^a, Sadasivam Kaushik ^b

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General and Comparative
journal homepage: www.elsevier.com/locate/ylg

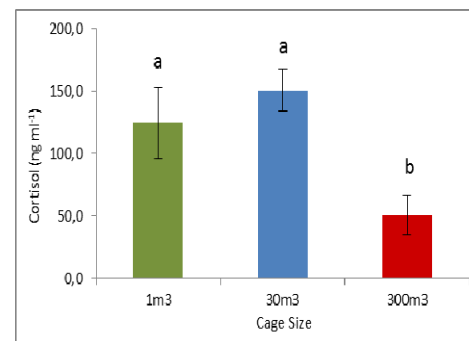
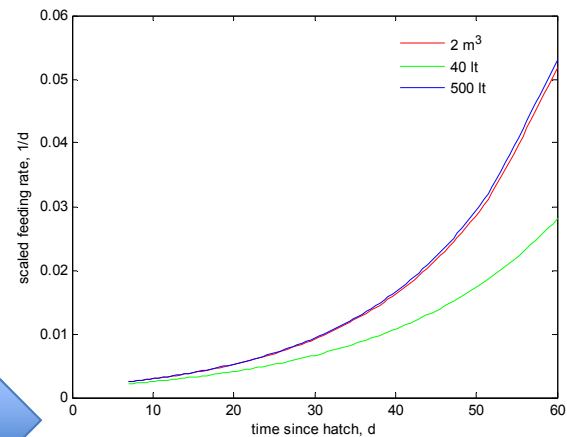
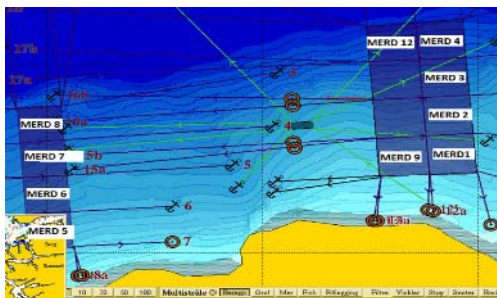
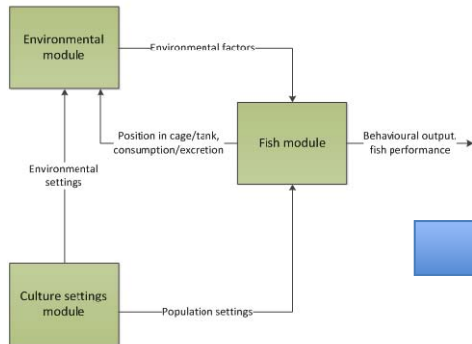
Metabolic and transcriptional responses of gilthead sea bream (*Sparus aurata* L.) to environmental stress: New insights in fish mitochondrial phenotyping

Azucena Bermejo-Nogales ^a, Marij Nederlof ^b, Laura Benedito-Palos ^a, Gabriel F. Ballester-Lozano ^a,
Ole Folkedal ^c, Rolf Eric Olsen ^c, Ariadna Stijá-Bobadilla ^a, Jaume Pérez-Sánchez ^{a,*}

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AQUA
EXCEL

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

WHICH FUTURE ?

Follow-up project AQUAEXCEL²⁰²⁰ 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 fish lines
- Nano-sensors for remote monitoring of experimental fish

The answer in January 2015!



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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DISCLAIMER



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