

ARI Progress

Over the last 3 years the Institute has been host to many European scientists whose visits have been funded by the "Access to Research Infrastructures" (ARI) action, part of the "Improving the Human Research Potential and the Socio-Economic Knowledge Base" programme of the EU 5th Framework Programme for R & D.

The ARI is designed to provide researchers throughout the European Community and associated states with opportunities for access to infrastructures that are essential for high quality research. This is a prestigious programme and the Institute is proud to have been selected as an infrastructure under the scheme. Unusually for the ARI programme the whole Institute plus its external facilities are included. In most cases only specific facilities within larger organizations are included as part of the programme. This reflects the excellence of the Institute's facilities and the expertise of its staff across the whole range of its research activities.

To gain access under the programme researchers in a European country other than the UK must submit a research proposal which is then considered by our selection panel. This consists of three Institute staff and three external members, two from outside the UK. If the proposal is accepted, mainly on the basis of its scientific excellence, and if Institute facilities are available the proposal is then passed to the Commission for final approval. Final details are then arranged between the visitor and the host laboratory within the Institute.

Projects can involve several visits by one or more scientists. Individual visits have lasted from 3-90 days, although the complete project can last for any period within the life-span of the programme. Most visits are for 3-4 weeks. The programme is generous in terms of funding the research and paying all travel and accommodation costs, plus a daily subsistence payment. Most work has



Bente Torstensen (centre) from the National Institute of Nutrition and Seafood Research, Directorate of Fisheries, Bergen came to work on analytical techniques related to a joint programme on salmon lipid nutrition with Gordon Bell (left) and Doug Tocher (right) of the Nutrition Group

been carried out in collaboration with Institute staff, but this is not essential and visitors may come just to use facilities with only technical support from the Institute. Over the initial three years of the programme the Institute has hosted 29 research projects from 25 user groups involving 48 visits by 38 scientists. Countries involved include Ireland, Norway, Denmark, Netherlands, Germany, France, Spain, Portugal, Italy, Hungary, Slovakia, Czech Republic and Israel. Overall this adds up to 1427 days, a significant effort by all concerned. Visitors range from young post-graduate scientists just starting on their careers to

distinguished senior scientists. Feedback from visitors has been very positive and both they and Institute staff seem to have gained great benefits from the programme. This was perhaps indicated by the fact that a number of groups submitted follow up projects during the course of the programme and some groups have submitted new projects for the second phase of the programme. It is very pleasing that many visitors had not previously come to the Institute and we hope that these contacts will lead to longer lasting associations and collaborations.



Tomas Scholz (left) and Roman Kuchka (right) from the Institute of Parasitology, Czech Academy of Sciences busy working through their fish samples

GROUP LEADER INFORMATION

| PROJECT TITLE | NAME | HOME INSTITUTION |
|---|----------------------|--|
| Sex determination in crustacea: towards optimising production via monosex culture. Studies on androgenic gland factors in <i>M. rosenbergii</i> | A. Sagi | Ben-Gurion University |
| A comparative study of the sensilla system of <i>Gyrodactylus caledoniensis</i> , <i>G. thymalli</i> and <i>G. salaris</i> from salmonids: the value of chaetotaxy in <i>Gyrodactylus systematics</i> | T. A. Bakke | University of Oslo |
| Determination of isoprostanes, novel peroxidation products from polyunsaturated fatty acids as a method for assessing generalised lipid peroxidation in cultured gilthead sea bream | G.M. Cano | University of Cadiz |
| Endocrine regulation of growth and feed intake in salmon smolts | S. O. Stefansson | University of Bergen |
| Diversity and biology of tapeworms, parasites of freshwater and marine fish | T. Scholz | Institute of Parasitology, Czech Academy of Sciences |
| The effect of dietary chromium and other immunostimulants on vaccination against bacterial kidney disease in rainbow trout | P. P. Gatta | University of Bologna |
| Changes in the lipid class composition of Atlantic salmon tissues in response to feeding diets containing vegetable oils | B. E. Torstensen | Institute of Nutrition, Directorate of Fisheries, Bergen |
| Pasteurellosis of aquatic species: detection and characterisation of the aetiological agent by molecular techniques | C. Massimo | University of Padova |
| Effects of light of different intensity and spectral composition on diel plasma melatonin profiles from <i>in-vitro</i> cultures of pineal glands of salmon post-smolts | G. L. Taranger | Institute of Marine Research, Bergen |
| Taxonomy and intraspecific variability of species of the genus <i>Eubothrium</i> , parasites of freshwater and marine fishes, using DNA analysis | I. Kralova-Hromadova | Institute of Parasitology, Slovak Academy of Sciences, Kosice |
| Bioassays to assess functional impairment from aquaculture chemicals in coastal waters | A. M. Soares | Universidade de Aveiro |
| Development and characterisation of monoclonal antibodies to sturgeon immunoglobulins | Z. Jeney | Research Institute for Fisheries, Aquaculture and Irrigation (HAKI) |
| Life cycle and development of myxozoans | K. Molnar | Veterinary Medical Research Institute, Hungarian Academy of Sciences, Budapest |
| Application of the hepatocyte metabolism assay to marine fish: the effects of diets containing vegetable oil on hepatic fatty acid metabolism in European sea bass | G. Cano | University of Cadiz |
| Sex determination in crustacea: towards optimising production via monosex culture. Studies on androgenic gland factors in <i>M. rosenbergii</i> . | A. Sagi | Ben-Gurion University |
| Characterisation of fatty acyl desaturation/elongation in intestine and/or isolated enterocytes in salmonids | R. Olsen | Institute of Marine Research, Bergen |

| GROUP LEADER INFORMATION | | |
|---|---------------------|---|
| PROJECT TITLE | NAME | HOME INSTITUTION |
| Studies of cytokine expression in the skin of rainbow trout during a parasite infection using <i>in-situ</i> hybridisation | K. Buchmann | Royal Veterinary & Agricultural University, Copenhagen |
| Histopathology, immunohistochemistry and ultrastructure of the intestine of farmed fish and wild fish infected with helminths | B. Dezfuli | University of Ferrara |
| Functional characterisation of delta 6-like fatty acid desaturases from rainbow trout and gilthead sea bream | P. Bergot | INRA, Unite de Nutrition des Poissons, St Pee sur Nivell |
| Fatty acid metabolism in isolated hepatocytes, enterocytes and gill cells from marine and freshwater fish | C. Gonzalez | Universidad de la Laguna, Tenerife |
| Biology and distribution of fish tapeworms | T. Scholz | Institute of Parasitology, Czech Academy of Sciences |
| Effects of nutrient enrichment in fish farm effluents on primary production in streams | A. Soares | University of Aveiro |
| Predicting demographic responses to chemical mixtures | C. Porte | Dept. Environmental Chemistry, ITQAB-CSIC, Barcelona |
| Causes of interspecific sensitivity to toxic substances in aquatic species and implications for probabilistic risk assessment | P. J. Van den Brink | Alterra Green World Research, Wageningen |
| The potential of tilapia culture in Europe and opportunities for enhanced production strategies | Y. Avnimelech | Dept. Agricultural Engineering, Technion, Haifa |
| Determination of the immune response of sturgeon following vaccination using anti-sturgeon Mabs | Z. Jeney | Research Institute for Fisheries, Aquaculture and Irrigation, Szarvas |
| Synthesis of PUFAs by the free-living nematode <i>Panagrellus redivivus</i> | K. Becker | Dept. Aquaculture Systems and Animal Nutrition, University of Hohenheim |
| Pathogenicity of amoebae, ciliates and flagellates from the gills of Atlantic salmon | M. Mulcahy | National University of Ireland, University College, Cork |
| Metallothionein analyses to assess ecotoxicity of copper speciation in freshwater lotic mesocosms | J.-M. Bonzom | Institut de l'environnement et des risques, Verneuil-enHalatte |

Table 1

As can be seen from Table 1 the range of research projects carried out was very wide and covered most research areas of the Institute. To mention only a few:

- Professor Stefansson and Dr Handeland from the University of Bergen studied the endocrine regulation of growth and food intake in salmonids with Niall Bromage and Mark Porter and found that the pineal gland, through the hormone melatonin plays a role in regulating food intake.
- Professor Soares and Dr Barata from the University of Aveiro worked with Donald Baird on bioassays to assess functional impairment from aquaculture chemicals in coastal waters and found that exposure of benthic copepods to cypermethrin and deltamethrin-contaminated algae reduced reproductive rates.
- Dr Scholz and Mr Kuchta from the Institute of Parasitology, Academy of Sciences of the Czech Republic, Ceske Budejovice investigated, with Andy Shinn, the biology and taxonomy of the cestode *Eubothrium* in Scottish salmonids as part of a Europe wide study. Unexpectedly they found a mixture of species which was confirmed using molecular methods in a separate project by Dr Kralova – Hromadova of the Institute of Parasitology of the Slovak Academy of Sciences, Kosice.



Valentina Zappulli (left) from the University of Padova and Alessio Bonaldo (right) from the University of Bologna made visits to work with Sandra Adams (centre) in the Aquatic Vaccine Unit

been possible. We believe this has been particularly beneficial for younger scientists. A number of fruitful collaborations have been established as a result of the programme and there is every likelihood that these will continue into the future.

The Institute has now been awarded a second phase of funding for the programme up to June 2005 and we are currently inviting applications for projects. We are particularly keen to receive proposals from groups who have not previously visited Stirling. If you would like to enquire about the programme or to develop a proposal please contact Andy Shinn or Rod Wootten at the address below or visit our website at <http://www.stir.ac.uk/aquaculture/lsf>

- From the Research Institute for Fisheries, Aquaculture and Irrigation, Szarvas, Hungary, Dr Zsigmond Jeney and Dr Galina Jeney, with Sandra Adams and Kim Thompson, developed and characterized monoclonal antibodies to immunoglobulins from a range of sturgeon species. These will be used to measure antibody response to pathogens.

the free living nematode *Panagrellus redivivus* with Doug Tocher and Gordon Bell. This nematode has potential as a food for larval fish and it was found that its fatty acid content could be modified by the fatty acid composition of the culture medium and its own capability to synthesize PUFAs.

- Professor Becker and Mr Schlechtriem from the University of Hohenheim studied the synthesis of polyunsaturated fatty acids (PUFAs) by

These and other projects have resulted in a number of publications and others are in the pipeline. Thus the programme has provided many European scientists with the opportunity to carry out top class research, which might otherwise not have

Rod Wootten
E-mail rw3@stir.ac.uk
Tel. 00 44 (0)1786 467870
Fax. 00 44 (0)1786 4472133

Andy Shinn
E-mail aps1@stir.ac.uk
Tel. 00 44 (0) 1786 467925
Fax. 00 44 (0) 1786 472133



Edit Esterbauer (left) and Orsi Racz (centre) from the Veterinary Medical Research Institute, Hungarian Academy of Sciences discuss some of the finer points of myxosporean phylogeny with Astrid Holzer (right) from the Parasitology laboratory