Curriculum vitae

**Name:** Ian Robert Bricknell

**Date of Birth:** 15 July 1961

**Age at 1 January 2019:**  57

**Marital status:** Married.

**Educational History**

*1986-1989* University of Lancaster PhD Supervised by the late Prof. W.T.W. Potts “The Ion Transporting Cells of Aquatic Insects” awarded August 1990.

*1983-1986* University of Reading B.Sc. (First Class Honours) Pure Zoology, final year project (supervised by the Late Prof. L.B. Halstead) “The Paeleopathology of Pleistocene Proboscideans.”

*1980-1983* Luton College of Higher Education (now Luton University) HND Medical Microbiology (merit)

*1977-1979* Luton VIth Form College 3 ‘A’ levels 1 ‘S’ level

*1972-1977* Denbigh High School Luton 8 GCE ‘O’ levels including English and Mathematics

**Employment History**

*2007 to date* Libra Professor of Aquaculture Biology School of Marine Sciences, University of Maine.

*2007 - 2013* Founding Director University of Maine’s Aquaculture Research Institute

*2000* - *2007* Fisheries Research Services (FRS) Marine Laboratory, Aberdeen (the FRS Marine Laboratory is an executive agency of the Scottish Executive), Principal Scientist (Department Head), Aquaculture & Aquatic Animal Health.

*1992-2000* Fisheries Research Services (FRS) Marine Laboratory, Aberdeen (the FRS Marine Laboratory is an agency of the Scottish Executive), Senior Scientist, Aquaculture & Aquatic Animal Health.

*1989-1992* FRS Marine Laboratory, Aberdeen, Higher Scientific Officer, Fish Immunology Section. Start date October 2nd 1989

*1983-1989 University education*

*1982-1983* Public Health Laboratory Service, Luton and Dunstable Hospital: Basic Grade MLSO, Immunology Department.

*1979-1982* Public Health Laboratory Service, Luton and Dunstable Hospital: Junior (Grade B) MLSO, Immunology Department.

**Current Areas of Responsibility**

Professor of Aquaculture Biology,School of Marine Science, University of Maine. Current research team 1 Post-Doctoral Research Fellow, 2 Graduate Students, 6 undergraduate research students

**Previous Responsibilities**

Group Leader of the Fish Immunological Diagnostics department at the FRS Marine Laboratory’s Aquaculture & Aquatic Animal Health programme based at the Marine Laboratory Aberdeen. The departments’ main role is to develop policy and draft new legislation, provide advice to government ministers and industry on current research and policy issues in fish immunology and disease control, the feasibility of new fish, shellfish & algae, such as halibut, for commercial aquaculture and fish vaccinology. Duties included the day to day management of a staff of 8 scientists, 2 Post Doctoral Research Fellows, 4 technicians and 4 PhD students. Management of the FRS Marine Laboratory’s fish immunology laboratory, Aberdeen. Management of the FRS Marine Laboratory’s Experimental Fish Research Station, Aultbea, WesterRoss UK.

Scientific input into the following projects during my tenure at the MLA.

**PI:-** Fish alpha virus aetiology, epidemiology and diagnosis; Inflammatory processes in PD, CMS & HSMI. Infectious Salmon Anaemia Virus research programme, Halibut cultivation, disease and vaccination problems, larval survival and immunology, Cod cultivation, disease and vaccination problems, larval survival and immunology, *In vitro* methods for the culture of sea lice, the physiological basis for sea lice infection, novel vaccines against sea lice. The application of immunostimulants to improved larval fish survival, Sea lice biology and epidemiology, the natural infective pressure of sea lice on wild salmonid populations. The immune response of Atlantic Cod to *Lernaeocera branchialis* infection

**ICES Responsibilities**

2009Member ICES SciCon Committee (2009-2012)

2006 Member ICES ConC Committee (Term of Office May 2006 to May 2009)

1. Chair ICES Mariculture Committee (Term of Office 1 January 2006 to 31 December 2008)
   1. UK Member ICES Mariculture Committee

1996-2002 UK Member of the ICES Working Group Marine Fish culture (WGMAFC)

Attributes and Awards

Vising Professor the University of Stirling UK 2016 - to date

EAFP Research Excellence Award 2005

Presidential Award of the American Plecoptera Society (1992)

University prize (Reading University) in Zoology 1986.

Co-winner of the Alison Grisley Prize (Reading University) 1985.

President of the Zoological Society of Reading University 1985-1986.

**Research grants and awards**

**Grants Prior to Current Post Tenure review**

2008 MAIC: Vaccination studies in juvenile cod, SMS **$27,218**

2008 NRAC: Investigations into the potential health and economic benefits of bivalve/finfish co-culture MAAHL/SMS **$150,000**

2008 DMR: Tools and techniques to recognize lobster stressors MAAHL/ SMS **$54,510**

2008 DMR: Health Risks of lobster bait to marine animals MAAHL/ SMS **$50,413**

2009 NRAC: Examination of finfish pathogen physiology and predictive ecology in a bivalve/finfish integrated multi-trophic aquaculture system SMS **$200,000**

2010 NRAC: Breeding resistance to Sea Lice and ISAV in Atlantic Salmon SMS **$199,350**

2011 NOAA Sea Grant: The Aquatic Animal Health Ecology of an Industry Deployed Integrated Multi-trophic Aquaculture System SMS **$399,544**

2011 MTAF: FISHLab: Fishery Innovation, Sustainability & Health Lab **$664,000**

2012 NRAC An investigation of effective vaccine targets in the salmon louse, *Lepeophtheirus salmonis* – an alternative lice control measure **$199,925**

2012 The role of wild and farmed fish in modulating the infectious pressure of the sea louse (Lepeophtheirus salmonis Krøyer 1837) **$461,438**

2012 Disease mitigation on fish farms: distinguishing origin and transport vectors of sea lice through food web analysis **$254,411**

2014 NSF EPSCoR Co PI SEANET (Sustainable Ecological Aquaculture Network) **$20 Million**

**Total Dollars Awarded: 2007-2014 *$22,715,222***

***Recent International Collaborators***

Prof Berjot Magnadottir University of Reykavik Iceland, Dr. B., Bragason, University of Reykavik Iceland, Dr. G. Nicholas University of London UK, Dr Sigidur Gudmundsdottir University of Reykavik Iceland, Dr S., Dodds, University of Nottingham UK, A.W. Dr Sigrund Lange University of London UK, Prof James Bron University of Stirling UK, Dr Roy Dalmo University of Tromso Norway, Prof Giuseppe Scapigliati, University of Viterbo, Italy, Prof Jan Rombert, Wageningen Univiersity Netherlands, Prof, Seonghoon Kim, University of Seoul, Korea, Prof. Miseon Park, Gangneug Univiesity, Korea, Dr Frank Kane, Marine Institute Galway Ireland, Dr Mark Fast, & Dr Kim Thompson Morden Research Institute Edinburgh Scotland.

Previous UK Core Funding

FC1199 Alpha viruses detection and diagnosis (2006-2009)

FC1198 Sea lice infective pressures (2005-2009)

FC1194 Seasonal Influences on Disease Susceptibility (2003-2004)

FC1193 Sea Lice Epidemiology And Biology (2003-2007)

FC1183 Molecular And Immunological Characterisation Of Scottish ISAV (2002-3)

FC1186 Developmental Immunity Of Larval Fish (2000-2004)

FC1173 Characterisation Of Scottish IPNV (1998-2002)

FC427 Vaccines Against Sea Lice (1994-2000)

FC286 Halibut Cultivation (1992-2000)

FC486 Vaccines against *Aeromonas salmonicida* (1989-1996)

C028 New Vaccines against Enteric Red Mouth Disease (1997-2000)

C682 Immunostimulants and Larval Fish (2001-2004)

C035 Applications of Artificially Culture Salmon Skins For the Maintenance Of Sea Lice (1996-2003)

UK Grant funding

Value of external research grants obtained 2000-2008

2008-2010 NRAC Funded project “Investigations into the Potential Health and Economic Benefits of Bivalve/Finfish Co-Culture” ($150,030)

2005-2007 SARF Funded Project: The Aetiology of CMS & HSMI (with *Prof S. Adams & Prof H. Ferguson* £112,000)

2005-2008 FSBI Funded PhD studentship “The Immunology of *Lernaeocera branchialis*, (with *Dr J Bron & Dr K. Thompson* £66,000)

2005 BMFA small research grant programme. Vaccination against *Vibrio anguillarum* 02 in Atlantic cod (£7,750)

2004-2007 SFIA & Schering Plough Funded PhD studentship: Characterisation of *Vibrio* sp. in Marine Aquaculture (with *Prof S. Adams & Dr K. Thompson* £87,000)

2004 NRC Canada short project “Induction of Defence Proteins in Fish Mucus” £12,600 *(with Prof S Johnson)*

2004-2007EWOS Funded Post doctoral fellowship Semio-chemicals and Host Identification in Salmon Lice*(with J. Mordue (Luntz), £106,000)*

2003 Project Leonardo Grant for “ISH Detection of IPNV in gonadal tissue of Atlantic salmon” (£11,342)

2003-2007 Novartis funded PhD studentship the role of acetate synthesis in improving the *in vitro* culture of sea lice *(£65,000)*

* 1. BMFA grant “Non destructive assessment of the disease status of marine fish broodstock” £20,500
  2. EU FAIR V Programme “Stimulation of fish larval defence mechanisms against infectious diseases” *(With R. Dalmo, J. Rombert, B. Gudmonsottir, T. Bowden, & G. Scapatliati €1,400,000) URL* http://www.nfh.uit.no/prosjektvis.aspx?id=87

2000-2002 Aquahealth Limited funding, “The aggressins of sea lice as possible immuno-therapeutics” *(With C. Sommerville. T. Bowden & R. Wootton £145,000)*

2000-2001 BMFA grant for a research technician on “Modelling the uptake of immuno‑therapeutics in larval marine fish” £18,500

2000-2001 CEC Funding proposal “research into aspects of the diagnosis of infectious salmon anaemia (ISA) and survival of ISA virus in the marine environment.*” (With R. Raynard & C. Cunningham £60,000)*

2000-2003 FRS PhD. Studentship “Chemical ecology of the host seeking stage of sea lice” *(with J. Mordue (Luntz), £36,000)*

2000-2003 ARC PhD. Studentship “The Physiological Basis for A Sea Louse Vaccine” (*With P Billingsley and R. Raynard*, £56,000)

1997-1999 Aquaculture Vaccines Ltd. Research Fellowship “The Protective Antigens of *Yersinia Rukerii*”. (£104,908)

1997-2000 British Halibut Association Grant “The Potential Role of Probiotics and Immunostimulants in Halibut Culture” (*With Harry Birkbeck Glasgow University* £58,948)

1997-2000 Link (MAFF and SSGA) Aquaculture PhD Studentship “Immunological Interactions between Atlantic salmon and the Sea Louse” (£45,442)

1996-1999 DTI Technology Foresight Challenge Grant “Halibut Cultivation” (£134,000)

1997 Two Project Leonardo Grants “Immune Parameters of Atlantic Halibut” & “Antibody Responses in Atlantic Halibut (£11,342)

1996 Project Leonardo grant “Complement Stability In Marine Flatfish” (£4,370)

1994-1996 British Council M.Phil. Studentship ‘*In Vitro* Methods for the Culture of *Lepeophtheirus Salmonis*.’ (£24,745)

1992-1996 SOAEFD PhD Studentship ‘The Regulation of the Immune System of Atlantic salmon’ (£21,226)

1990-1994 Co-author of Four Annual Grants from the Scottish Salmon Growers Association Totalling £365,000 (*With A.E. Ellis and A.L.S. Munro*)

**Teaching Experience**

**Courses Taught Prior to 2015-19 Post Tenure Review**

2008 SMS598 Special Topics Marine Science “Bioethics and the design of aquatic experiments

2009 SMS421 Fish Aquaculture II 6 lectures and 3 labs Fish “Immunology, biosecurity and Fish vaccinology

2007 SMS211 Introduction to Aquaculture

2008 SMS598 Special Topics Marine Science Aquatic animal experimental design and bioethics

2008 SMS211 Introduction to Aquaculture

2009 SMS598 Special Topics Marine Science Diseases of Aquatic Animals

2009 SMS211 Introduction to Aquaculture

2010 SMS401 Critical Issues in Aquaculture Infectious Diseases of Fish and Shellfish

2010 SMS211 Introduction to Aquaculture

2010 SMS401 Critical Issues in Aquaculture Vaccinology

2011 SMS421 Fish Aquaculture II 6 lectures and 3 labs Fish Immunology, biosecurity and Fish vaccinology

2011 SMS422 Fish Biology this course was completely revised for 2011 and will become a 4 credit course with a new lab in 2013.

2012 SMS401 Critical Issues in Aquaculture introduction to fish parasites

2012 SMS422 Fish Biology

2013 SMS422 Fish Biology with Laboratory Module

2014 SMS422 Fish Biology with Laboratory Module

2014 SMS401 Critical Issues in Aquaculture introduction to fish parasites

2015 SMS491 The Biology of Sharks

**Courses taught in the UK**

**2006 to 2007** “Bioethics: The ethical use of animal experimentation” (as part of the final year course for the BSc Zoology & Biology). University of Aberdeen.

**1998 to 2007** “History of Aquaculture”, “Aquaculture systems” and “Diseases of Emerging Aquaculture Species” modules: on the MSc “Marine and Fisheries Science: Sustainable management of living marine resources” at the University of Aberdeen.

**1999 to date** “Vaccines Against Fish Parasites” Module 4: Bi-annual Fish Immunology Course, Université de Wageningen, Wageningen, Netherlands.

**1994 to date** “Practical Applications of Lower Vertebrate Immunology”: (as part of the Developmental Immunology course): Taught to BSc Immunology, Medicine, and Veterinary Sciences students, University of Glasgow.

**1990 to 2001** “Fish Immunology” and “Immunological detection of fish diseases” B.Tech Aquaculture Scottish Agricultural College Aberdeen

**Membership of Professional and Academic Bodies.**

Fellow of the Royal Entomological Society (*by invitation*).

Associate of the Institute of Medical Laboratory Sciences (*by examination*)

Member of the European Association of Fish Pathologists.

Member American Fisheries Society

Member of the Palaeontology Association

American Fisheries Society

World Association Copepodologists

**Membership of Committees & Outside Organisations**.

**External Service and Professional Bodies Prior to 2015-19 Post Tenure Review**

Associate Editor for Aquaculture, Journal of Applied Ichthyology 2014-To Date, ICES.

Chair of the Sea lice 2014 Executive and organising committee, Mariculture Science Committee 2007 to date, Chair Scientific Committee 7th NOFFI Fish Immunology Conference, Stirling University, June 2007, Paisley University, Biological Sciences Subject Health Review Committee Member 2006, AHJWG committee 1999-2007, Chair AHJWG working group on interactions between aquaculture species 2003-2005, Member of the ICES Marine Fish Culture Working group 1999-2003 SEERAD representative on the following:- CSG halibut scientific steering committee, CSG scallop scientific steering committee, CHABOS Lectin working group 1996-97, SSGA furunculosis working group 1992-1997, Technology Foresight halibut cultivation committee 1991-1998, cod farming demonstration consortium 1997-2000.

**Publications**

**(Not including symposiums, proceedings *etc.*)**

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| --- |
| Michael Pietrak†, Alexander Jensen¥, Gayle Barbin Zydlewski & **Ian Bricknell.**The Three-Spined Stickleback; *Gasterosteus aculeatus* Linnaeus 1758, Plays a Minor Role as Host of *Lepeophtheirus salmonis*; (Krᴓyer 1837) in the Gulf of Maine. *Journal of Fish Diseases* Awaiting DOI  Barker, S.E†., **Bricknell, I.R**., Covello, J., Purcell, S., Fast, M.D., Wolters, W. & Bouchard, D.A. (2019) Sea lice, *Lepeophtheirus salmonis* (Kroyer 1837), infected Atlantic salmon (*Salmo salar* L.) are more susceptible to infectious salmon anemia virus. *PLOS ONE,* **14**.  Magnadottir, B., Bragason, B.T., **Bricknell, I.R**., Bowden, T., Nicholas, A.P., Hristova, M., Gudmundsdottir, S., Dodds, A.W. & Lange, S. (2019) Peptidylarginine deiminase and deiminated proteins are detected throughout early halibut ontogeny - Complement components C3 and C4 are post-translationally deiminated in halibut (*Hippoglossus hippoglossus* L.). *Developmental and Comparative Immunology,* **92,** 1-19.  Bowden, T.J., **Bricknell, I.R**. & Preziosi, B.M§. (2018) Comparative pathogenicity of Vibrio spp., *Photobacterium damselae ssp damselae* and five isolates of *Aeromonas salmonicida* Var *achromogenies* in juvenile Atlantic halibut (*Hippoglossus hippoglossus*). *Journal of Fish Diseases,* **41,** 79-86.  **Bricknell, I.** (2017) Types of Pathogens in Fish, Waterbourne Diseases. (Chapter 3), In: *Fish Diseases Prevention and control strategies* (ed. by J. Jeney), pp. 53-74. Wiley, London.  Frederick, C§., Brady, D.C. & **Bricknell, I.** (2017) Landing strips: Model development for estimating body surface area of farmed Atlantic salmon (*Salmo salar*). *Aquaculture,* **473,** 299-302.  Piesz, J.§, Barker, S†. & **Bricknell, I.** (2016) Effects of the secretory/excretory products of *Lepeophtheirus salmonis* on Atlantic salmon leukocyte migration. *Fish & Shellfish Immunology,* **53,** 84.  Borsky, A.J. ¥ & **Bricknell, I.R.** (2016) The ontogeny of neurosensory structures in larval Atlantic halibut, *Hippoglossus hippoglossus* (Linnaeus, 1758). *Journal of Applied Ichthyology,* **32,** 669-674  Pert, C.C., Fryer, R.J., Cook, P., Kilburn, R., McBeath, S., McBeath, A., Matejusova, I., Urquhart, K., Weir, S.J., McCarthy, U., Collins, C., Amundrud, T., **Bricknell, I.R.,** 2014. Using sentinel cages to estimate infestation pressure on salmonids from sea lice in Loch Shieldaig, Scotland. Aquac. Environ. Interact. 5, 49-59.  Molloy, S.D., Pietrak, M.R., Bouchard, D.A., **Bricknell, I.,** 2014. The interaction of infectious salmon anaemia virus (ISAV) with the blue mussel, Mytilus edulis. Aquac. Res. 45, 509-518.  **Bricknell I,** Langston A (2013) Aquaculture: It’s not all about Atlantic Salmon.  J Fisheries Livest Prod 1:e103. doi: 10.4172/2332-2608.1000e103  The settlement and reproductive success of *Lepeophtheirus salmonis* (Kroyer 1837; Copepoda: Caligidae) on atypical hosts (2012)  Pert Campbell C.; Mordue (Luntz) A. Jennifer; O'Shea Brid; & **Bricknell Ian R.**  Aquaculture Research Volume: 43 Issue: 6 Pages: 799-805 DOI: 10.1111/j.1365-2109.2011.02891  Bowden, T.J., **Bricknell, I.R.,** 2013. Management of finfish and shellfish larval health in aquaculture hatcheries. Woodhead Publ. Food Sci. Technol. Nutr., 223-245.  Barker, S., Covello, J.M., Bouchard, D., Wolters, W., Fast, M., **Bricknell, I.,** 2013. Lice and ISAV: Are 'lousy' salmon more susceptible? Fish Shellfish Immunol. 34, 1637-1638.  Potential role of *Mytilus edulis* in modulating the infectious pressure of *Vibrio anguillarum* 02 beta on an integrated multi-trophic aquaculture farm (2012)  Pietrak Michael R.; Molloy Sally D.; Bouchard Deborah A. & **Bricknell Ian R**.  Aquaculture Volume: 326 Pages: 36-39 DOI: 10.1016/j.aquaculture.2011.11.024  Molloy SD, Pietrak MR, Bouchard DA & **Bricknell IR** (2011)  Ingestion of *Lepeophtheirus salmonis* by the blue mussel *Mytilus edulis*  Aquaculture Volume: 311 Issue: 1-4 Pages: 61-64  D. A. Bouchard, D. Basti, and **I. Bricknell** (2010)  Where Has All The Gaffkemia Gone?  Pages 99-106 *In* Cipriano, R. C., Bruckner, A., and Shchelkunov, I. S., editors. Aquatic Animal  Health: A Continuing Dialogue Between Russia And The United States. Proceedings  of the Third Bilateral Conference Between the United States and Russia: Aquatic  Animal Health 2009. 12-20 July 2009. Shepherdstown, West Virginia. Michigan  State University, East Lansing, Michigan.  Basti D, **Bricknell I**, Chang ES & Bouchard D.A. (2010)  Biochemical Reference Intervals For The Resting State In The Adult Lobster *Homarus Americanus*  Journal of Shellfish Research Volume: 29 Issue: 4 Pages: 1013-1019  Cook PF, McBeath SJ, **Bricknell IR**, & Bron JE (2010)  Determining the age of individual *Lepeophtheirus salmonis* (Kroyer, 1837) copepodids by  measuring stored lipid volume; proof of principle  Journal Of Microscopy Volume: 240 Issue: 1 Pages: 83-86  Basti D, **Bricknell IR**, Hoyt K & Bouchard DA (2010).  Factors affecting post-capture survivability of lobster *Homarus americanus*  Diseases Of Aquatic Organisms Volume: 90 Issue: 2 Pages: 153-166  Kilburn R, **Bricknell IR**, Cook P, et al (2010).  Design and application of a portable, automated plankton sampler for the capture of the  parasitic copepods *Lepeophtheirus salmonis* (Kroyer 1837) and *Caligus elongatus*  (Von Nordmann 1832)  Journal of Plankton Research Volume: 32 Issue: 6 Pages: 967-970  Urquhart K, Pert CC, Fryer RJ, & **Bricknell IR** (2010)  A survey of pathogens and metazoan parasites on wild sea trout (*Salmo trutta*)  in Scottish waters  ICES Journal of Marine Science Volume: 67 Issue: 3 Pages: 444-453 |

Patricia Noguera, Catherine Collins, David Bruno, Campbell Pert, Anna Turnbull, Alison McIntosh, Katherine Lester, **Ian Bricknell**, Stuart Wallace, & Paul Cook (2009)

Red vent syndrome in wild Atlantic salmon *Salmo salar* in Scotland is associated with *Anisakis simplex sensu stricto* (Nematoda: Anisakidae)

Diseases of Aquatic Orgnaisms Vol. 87 (3) 199–215

Pert CC, Raffell J, Urquhart K & **Bricknell IR** (2009)

The pathogen burden of early returning sea trout (*Salmo trutta* L.) infected with *Lepeophtheirus salmonis* (Kroyer, 1837), in the River Shieldaig, Scotland

Bulletin of the European Association of Fish Pathologists Volume: 29 Issue: 6 Pages: 210-216

Gratacap, R.M.L., Thompson, K.D., **Bricknell, I.R.** & Adams, A. (2009)

Lipopolysaccharide extraction: a phenol alternative.

Journal of Fish Diseases, 32, 811-814.

Basti, D., **Bricknell, I**., Beane, D. & Bouchard, D. (2009)

Recovery from a near-lethal exposure to ultraviolet-C radiation in a scleractinian coral.

Journal of Invertebrate Pathology, 101, 43-48.

Campbell C. Pert, A. Jennifer Mordue (Luntz), Robert J. Fryer, Bríd O'Shea, **Ian R. Bricknell** (2009)

The settlement and survival of the salmon louse, *Lepeophtheirus salmonis* (Krøyer, 1837), on atypical hosts

Aquaculture 288 321–324

McCarthy, U.M., Bron, J.E., Brown, L., Pourahmad, F., **Bricknell, I.R.,** Thompson, K.D., Adams, A., Ellis, A.E. (2008)

Survival and replication of *Piscirickettsia salmonis* in rainbow trout head kidney macrophages.

Fish & Shellfish Immunology 25, 477-484.

McCarthy UM, Urquhart KL, **Bricknell IR** (2008)

An improved in situ hybridization method for the detection of fish pathogens

Journal of Fish Diseases 31(9) 669-677

K. Urquhart, C. C. Pert, R. Kilburn, R. J. Fryer, and **I. R. Bricknell (**2008)

Prevalence, abundance, and distribution of *Lepeophtheirus salmonis* (Krøyer, 1837) and *Caligus elongatus* (Nordmann, 1832) on wild sea trout *Salmo trutta* L.

ICES Journal of Marine Science, 65, 171-173.

B. O’Shea, A.J., Mordue (Luntz), R.J Fryer, & **I.R. Bricknell** 2006

Determination of the Surface Area of a Fish

J Fish Dis 29(7):437-40

**I.R. Bricknell,** S. Dalesman, B. O’Shea, C.C. Pert, & J. Mordue 2006

The Effect of Environmental Salinity on Sea lice (*Lepeophtheirus salmonis*) Settlement Success

Dis Aquat Org. 71(3):201-12

McBeath, S. J., Ellis, L. M., Cook, P. F., Wilson, L., Urquhart, K. L. and **Bricknell, I. R.**

Rapid development of polyclonal antisera against infectious salmon anaemia virus and its optimisation and application as a diagnostic tool.

J Fish Dis 29 (5), 293–300.

The Sea Bass (*Dicentrarchus labrax* L.): A Peripatetic Host of *Lepeophtheirus salmonis*? 2006

C.C. Pert, K. Urquhart and **I.R. Bricknell**

Bull EAFP 26(4) 163-165

Bergljót Magnadottir, Bjarnheiðu K. Guðmundsdóttir, Sigrún Lange, Slavko Bambir, Agnar Steinarsson, Matthias Oddgeirsson, Tim Bowden, **Ian Bricknell**, Roy Dalmo & Sigríður Guðmundsdóttir 2006

Immunostimulation of cod (*Gadus morhua* L.) larvae and juveniles

J Fish Dis 29 147-155

James Bron, Campbell Pert, Christina Sommerville, Hege Helleberg & **Ian Bricknell** 2006

Diseases of gadoid fish (an update)

Bulletin of the European Association of Fish Pathologists 26(1) 43-46

**I.R. Bricknell,** J.E. Bron & T.J. Bowden 2005

Diseases of Gadoid Fish in Cultivation: A Review

ICES Journal of Marine Science63 253-266

Sigrun Lange, Slavko H. Bambir, Alister W. Dodds, Tim Bowden, **Ian Bricknell,** Sigrun Espelid, Bergljót Magnadóttir 2005

Complement component C3 transcription in Atlantic halibut (*Hippoglossus hippoglossus* L.) larvae.

Fish & Shellfish Immunology 20 (3) 285-94.

**Ian Bricknell** & Roy A. Dalmo 2005

The use of immunostimulants in fish larval aquaculture

Fish & Shellfish Immunology 19 (5) 457-472

Bowden, T.J., Butler R.and **Bricknell I.R.** 2004

Seasonal variation of serum lysozyme levels in Atlantic halibut (*Hippoglossus hippoglossus* L.)

Fish and Shellfish Immunology Fish & Shellfish Immunology 17(2): 129-135.

David W. Verner - Jeffreys, Robin J. Shields, **Ian R. Bricknell** and T. Harry Birkbeck 2004

Effects of different water treatment methods and antibiotic addition on larval survival and gut microflora development in Atlantic halibut (*Hippoglossus hippoglossus* L.) yolk-sac larvae

Aquaculture 232 (1-4): 129-143

**I.R. Bricknell**, H.E. Hayes, P. Billingsley, A.J. Vigneau, C. Sommerville & R.S. Raynard 2003

Vaccines Against the Salmon lice *(Lepeophtheirus salmonis)-* A Holy Grail, or just around the corner?

Journal of Parasitology 89(S) 149-157

M. Snow, R.S. Raynard, A.G. Murray, D.W. Bruno, J.A. King, R. Grant, **I.R. Bricknell**, N. Bain & A Gregory 2003

An Evaluation of current Diagnostic tests for the detection of infectious salmon anaemia virus (ISAV) following experimental water-borne infection of Atlantic *salmon Salmo salar L.*

Journal of Fish Diseases 26, 135-145

**I.R. Bricknell**, & T.J. Bowden 2003

Immunostimulants and their role in fish health management

Fish Farmer Magazine 26(1) 10-11

Timothy J Bowden, Katy Adamson, Philip MacLachlan, Campbell C Pert and **Ian R Bricknell** 2003

Long-Term Study of antibody response and injection-site effects of oil adjuvants in Atlantic halibut (*Hippoglossus hippoglossus* L.)

Fish & Shellfish immunology 14 363-369

David W. Verner - Jeffreys, Robin J. Shields, **Ian R. Bricknell** and T. Harry Birkbeck 2003

Changes in the gut-associated microflora during the development of Atlantic halibut (*Hippoglossus hippoglossus* L.) larvae in three British hatcheries.

Aquaculture 219 21-43

T.J. Bowden, D Menoyo-Luque, **I.R. Bricknell** & H Wegiland 2002

Efficacy of Different Administration Routes for Vaccination Against *Vibrio anguillarum* in Atlantic Halibut (*Hippoglossus hippoglossus* L.)

Fish & Shellfish Immunology *12 (3)* 283-285

Louisa Wilson, Katy Adamson, Laura Ellis, Paul Cook, Sonia McBeath & **Ian Bricknell** 2002

An Alkaline Phosphatase-Based Method for the Detection of Infectious Salmon Anaemia Virus (ISAV) in Tissue Culture and Tissue Imprints

Journal of Fish Diseases 25:615-619

**I.R. Bricknell**, P.F. Bisset & T.J. Bowden 2002

The Function of Atlantic Salmon (*Salmo salar* L.) Antibodies Under Extremes of pH and Osmolarity.

Fish & Shellfish Immunology *13:215-219*

Hiney M., Rodger H., **Bricknell I**., Casburn P. & Mulcahy D. 2002

Aquaculture development and regulation: incompatibility or harmony?

*Bulletin of the European Association of Fish Pathologists* 22:178-184

Robert S Raynard, **Ian R Bricknell,** Peter F Billingsley, Alasdair J Nisbet, Antoine Vigneau and Christina Sommerville 2002

Development of vaccines against sea lice

Pest Management Science *58:569-575*

D.A. Smail, R. Grant, K. Ross, **I.R. Bricknell** & T.S. Hastings 2001

The use of haemabsorption for the isolation of infections salmon anaemia virus on SHK-1 cells from Atlantic salmon (*Salmo salar* L.) From Scotland

Bulletin of the European Association of fish Pathologists 20(5) 212-214

T. J. Bowden, K. Lester, P. MacLachlan and **I. R. Bricknell** (2000)  
Preliminary Studies into the Short-Term Effects of Adjuvants on Atlantic Halibut (*Hippoglossus hippoglossus* L.)

Bulletin of the European Association of fish Pathologists 20(4) 148-152

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Infectious Salmon Anaemia

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Bulletin of the European Association of Fish Pathologists **17(6) 267-269**

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Fish and Shellfish Immunology **7, 377-385**

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The inability to detect Infectious Pancreatic Necrosis Virus (IPNV) in crustacean diets for larval Atlantic halibut, *Hippoglossus hippoglossus* L..

Bulletin of the European Association of Fish Pathologists **17(4) 129-131**

**Bricknell I.R.** Bowden T.J. Lomax, L. and Ellis A.E. (1997)

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Fish and Shellfish Immunology **7 (1) 1-16**

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Journal of Fish Diseases **19, 469-474**

**I. R. Bricknell,** D. W. Bruno, T.J. Bowden and P. Smith 1996

Fat Cell Necrosis Syndrome in Atlantic Halibut (*Hippoglossus hippoglossus* L.).

Aquaculture **144 65-69**

**Bricknell I.R.** and Bruno D. W. 1995

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A reliable method for the induction of experimental furunculosis

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R.S. Raynard, A.L.S. Munro, J. King, A. E. Ellis, D. W. Bruno, **I. R. Bricknell,** P. Vahanakki, R. Wotton, C. Sommerville, A. Petrie, B. Vivers, O. Andrade‑Salas, W. Melvin, T. Amezega, M. B. Labus, J.J. Coull, P. Relly, M.F. Mulcahy, M. O'Donoghue, and J. O'Connell. 1994

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**Bricknell I.R.** & Ellis A.E.1993

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Fish Farmer **16(5) 16‑19**

Coleman G., Bennett A.J., Whitby P.W. and **Bricknell I.R.**  1993.

A 70 kDa *Aeromonas salmonicida* serine protease ‑ ‑galactosidase hybrid protein as an antigen and its protective effect on Atlantic salmon (*Salmo salar* L.) against a virulent *A. salmonicida* challenge.

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Ellis A.E., **Bricknell I.R.** & Munro A.L.S. 1992.

Patent PCT/GB92/01016 Vaccines against *Aeromonas salmonicida*

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Patent D/IPR/1G0024 Methods for the detection of the protective antigens of *Aeromonas salmonicida*.

**Bricknell I.R.,** Ellis A.E. & Munro A.L.S. 1992.

The Current Status of a Scottish Furunculosis Vaccine.

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The Status of Furunculosis Vaccines.

Bulletin of the Aquaculture Association of Canadian **92(1) 10‑14**

Potts W.T.W. and **Bricknell I.R**. 1992.

The Ionic Composition of Ion Transporting Cells in Stonefly Nymphs.

Scanning Microscopy **6(1) 287‑294**

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X‑Ray Microanalysis as a Tool for Measuring Intracellular Ions

Microscopy and Analysis **5(3) 7‑13**

**Bricknell I.R.** & Potts W.T.W., 1989

Silver Staining of Ion Transporting Cells

**Practical Exercises in Biology Vol. 7** (W.T.W. Potts Ed.) Lancaster University Press, Lancaster.

**Bricknell I.R.** & Potts W.T.W., 1989

The Distribution of the Mitochondria Rich Ion Transporting cells of British Plecoptera, In relation to the Habitat

Entomologist **108(3) 176‑183**

**Bricknell I.R.** & Potts W.T.W., 1988

The Effects of Acidification on the Coniform Mitochondria Rich Ion Transporting Cells of Plecoptera

Proceedings of the Royal Microscopic Society **23 107‑108**

**Bricknell I.R.** & Potts W.T.W. 1988

The Effects of Low pH on the Coniform Mitochondria Rich Ion Transporting Cells of Plecoptera.

Institute of Physics Conference Series **93(3) 583‑584**

**Bricknell I.R.** 1986.

The Paeleopathology of Pleistocene Proboscideans

Modern Geology **11(4) 186‑202**

***Invited papers/plenary lectures***

Sea Lice Secreted Products Can Reduce *Lepeophtheirus salmonis* Infection in Atlantic Salmon  
Jessica L. Piesz†**,** Sarah E. Barker, Ian R. Bricknell WAS New Orleans March 2019

**I Bricknell**. Disease Ecology in Integrated aquaculture systems Second international symposium on IMTA Busan University Republic of Korea 14-15th September 2018

**Ian Bricknell.** A Physiological Basic for sea lice vaccines. John Hopkins University Invited Lecture Series May 2018

**Ian Bricknell**. Why are sea lice such a successful parasite in farmed fish? the Institute of Marine Environmental Technology Public Lecture Series Baltimore May 2018

**Ian Bricknell.** 30 Years in the trenches. Where did we go wrong (and Right) in Sea Lice research? 44th Eastern Fish Health Workshop Chattanooga TN 9-14th April 2018

**Ian Bricknell** and Jessic Piezs “Why Current Vaccines Against Sea Lice Don’t Work” Aquaculture America San Antonio Texas Feb 2017

**Ian Bricknell** “Hunting the Bugs, disease ecology in a simple ecosystem” Inchon Technical University South Korea July 2017

**Ian Bricknell** “Aquaculture in a changing Environment” 1st International symposium on Integrated Multi Trophic Aquaculture, Busan South Korea August 2017

**I Bricknell**. That’s Because you are an Evil Aquaculture Scientist. World Aquaculture 2016 Las Vegas Nevada Feb 22-26 2017

**Ian Bricknell** “Advancing knowledge in IMTA via information exchange and cooperative research between USA and Korea.” Annual JPA meeting University of Washington January 2016

**I Bricknell** & Emma Taccardi “The Lumpfish *Cyclopterus lumpus* as a Potential Biological Control for Sea Lice on Salmon Farms” 40th Eastern Fish Health Conference, Virginia Sept 2015

Where are all the sea lice? Searching the wild fish of Cobscook Bay

A. Jensen, M. Pietrak\*, S. Barker, G. Zydlewski and **I. Bricknell**

Sea Lice 2014 Aug31st-Sept 5th Portland Maine

C. Frederick\*, M. Pietrak, S. Barker, D. Brady and **I. Bricknell**

Where are all the sea lice? A first glance at sentinel fish in Cobscook Bay

Sea Lice 2014 Aug31st-Sept 5th Portland Maine

J.L. Piesz\*, **I.R. Bricknell**, Hernan Pizarro, S.E. Barker

Increased susceptibility to infectious salmon anemia virus (ISAv) in Lepeophtheirus salmonis – infected Atlantic salmon

Sea Lice 2014 Aug31st-Sept 5th Portland Maine

A physiological approach to vaccines against fish parasites

**Ian Bricknell1**, Sarah Barker1 and James Bron2

1 Aquaculture Research Institute 2 5735 Hitchner hall, University of Maine Orono, ME 04469-5735, 2 Institute of Aquaculture University of Stirling, Stirling, UK FK9 4LA  
[https://www.was.org/wasmeetings/meetings/showabstract.aspx?Id=28651](https://www.was.org/wasmeetings/meetings/ShowAbstract.aspx?Id=28651)

Disease risks on integrated multi-trophic aquaculture farms: reshaping disease paradigms Michael Pietrak\*, Sally Molloy, Deborah Bouchard, and **Ian Bricknell** Aquaculture Research Institute University of Maine 5735 Hitchner Hall Orono, ME 04469-5735

[Https://www.was.org/wasmeetings/meetings/showabstract.aspx?Id=28694](https://www.was.org/wasmeetings/meetings/ShowAbstract.aspx?Id=28694)

Ecological aquaculture in land-based and open water systems or How to Manage  
Diseases in Artificial Ecosystems **I Bricknell** Bremerhaven Forum February 2013  
<http://www.aquaculture-forum.de/en/workshop-iii/>

Barker, S., Covello, J.M., Bouchard, D., Wolters, W., Fast, M. and **Bricknell, I**.

Sea Lice and ISAv: Are ‘lousy’ salmon more susceptible?

1st International Conference of Fish and Shellfish Immunology, Vigo, Spain, June 25- 28, 2013.

Barker, S., Bouchard, D., Covello, J.M., Wolters, W., Fast, M. and **Bricknell, I**.

Are ‘lousy’ fish more susceptible to ISAV infection? And what is the role of lice in

transmitting ISAv?

Atlantic Canada Fish Farmers Association Annual Fall Workshop, St Andrews, N.B.,

November 14-15, 2012.

Covello, J.M., Barker, S., Bouchard, D., Wolters, W., Fast, M. and **Bricknell, I**.

Effects of Sea Lice Infections and ISAv on Atlantic Salmon: host strain differences.

Atlantic Canada Fish Farmers Association Annual Fall Workshop,

St Andrews, N.B., November 14-15, 2012.

T.J. Bowden and **I.R. Bricknell**. Getting to the point. How to develop an injectable vaccine.

Eastern Fish Health Workshop, Gettysburg. April 2013

**I Bricknell** & M Pietrak Gangneug Sea Grant International Symposium"

Held at Gangneug University Republic of Korea March 26th 2013

Vaccines against fish parasites

I Bricknell" 1st International Integrated Multi-Trophic Aquaculture (IMTA) Symposium"

Busan, Republic of Korea March 28-29, 2013

Pietrak M, Bouchard, D. & **Bricknell I**

Preparation of finfish for disease diagnostics

http://www.northeastaquaculture.org/

Finfish Culture in Recirculating Aquaculture Systems: Let's Talk Integration

M Pietrak & **I Bricknell**

NACE 2013 Mystic Connecticut

http://www.northeastaquaculture.org/

Disease Risks on Integrated Multi-Trophic Aquaculture Farms: Reshaping Disease Paradigms

M Pietrak D Bouchard Sally Dixon-Molloy & **I Bricknell**

[www.northeastaquaculture.org/](http://www.northeastaquaculture.org/)

NACE 2013 Mystic Connecticut

Deploying a Commercial Scale Mussel Raft on a Salmon Farm: More than just growing fish and mussels

Mike Pietrak, Chris Bartlett, Dana Morse, Jeff Robinson, Sally Molloy, Deborah Bouchard, David Miller, and **I Bricknell**.

<Http://www.northeastaquaculture.org/>

NACE 2013 Mystic Connecticut

Gulf of Maine Research Institute SeaState Lecture 7.0 Series March 8, 2012

Integrated Multitrophic Aquaculture. How to Manage Diseases in an Artificial Ecosystem

**Ian Bricknell**, (invited speaker)

Scratch My Itch: Those Pesky Sea Lice

Dr **Ian Bricknell** (invited speaker)

37th Eastern Fish Health Workshop; High Peaks Resort, Lake Placid, New York 23 - 27 April 2012

2011 First EWOS Fish Biotechnology Lecture, Immunostimulants a new dawn in fish vaccines?

**Ian Bricknell**

PEI Veterinary School May 2011

2010 Plenary Lecture Immunology of Fish Parasites,

**Ian Bricknell**

1st EOFFI Conference Viterbo Italy June 3-8

2009 Plenary Lecture Prevalence of Gaffkemia in Pounded Lobsters. Third Bilateral Conference Between the 2009 David Basti, Deborah Bouchard & **Ian Bricknell**

Distribution of Sea Lice in Enclosed Bays, PEI Veterinary School Lecture Series

United States and Russia: Aquatic Animal Health 2009 July 12 – 20, 2009 Clarion Hotel and Conference Center Shepherdstown, West Virginia, U.S.A.

2008 GMRI Sea State 3.0 - Sea Lice: Do They Come From Fish Farms?

**Ian Bricknell**

March 15th GMRI Portland ME

Keynote lecture: Monitoring the Infective Pressure of *Lepeophtheirus Salmonis* (Krøyer 1837) on Wild Salmonid Populations in Loch Torridon, Scotland

**Ian R. Bricknell**, Campbell C. Pert, Paul Cook, Rachael Kilburn, Sonia McBeath

World Aquaculture Society San Antonio Texas Feb 27-March 3rd 2007 Special session SEA LICE- Infection Dynamics on Farms and Interactions with Wild Salmon

Plenary lecture: The physiology of sea lice *(L. salmonis*) in relation to successful settlement on its host’s

**I.R. Bricknell** & J.E. Bron

ICOPA XI, The Scottish Exhibition and Conference Centre (SECC), Glasgow Scotland UK.

6-11th August 2006

Sea Lice infection of salmonid smolts in estuaries

###### I.R. Bricknell

Invited speaker: University of Aberdeen Seminar series May 2006

*Flexibacter ovolyticus* and other emerging pathogens in the UK halibut industry

###### I.R. Bricknell

Plenary lecture BMFA VIIIth annual conference, November 2006 Date & location TBC)

Biosecurity in ornamental aquaculture: keeping Koi Herpes virus out

###### I.R. Bricknell

Plenary lecture: OATA conference,13th-14th November 2006 The Britannic Royal Hotel, Coventry

###### *Selected recent papers/plenary lectures*

Advances in *Vibrio anguillarum* 02 vaccines in farmed Atlantic cod

**I.R. Bricknell** & K. Urquhart

Plenary lecture BMFA annual conference, Oban, November 8-9 2005

Rapid Detection of BKD in Salmonid Fish by IFAT

K. Urquhart٭, P. Cook, S. J. McBeath, J. E. Bron, and **I. R. Bricknell**

11th International meeting of the EAFP Copenhagen September 2005

Workshop 4 Diseases of gadoid fish

**Ian Bricknell** & James Bron (coordinators)

11th International meeting of the EAFP Copenhagen September 2005

0-119 Emergence of Disease risks to gadoid in culture

**Ian Bricknell,** Tim Bowden, S.C. Johnson & James Bron

11th International meeting of the EAFP Copenhagen September 2005

0-120 Parasites of Cultured gadoids: current perspectives and future prospects

James Bron**,** A.P. Shinn, S.C. Johnson & **Ian Bricknell**

11th International meeting of the EAFP Copenhagen September 2005

The Survival of the parasitic sea louse (*Lepeophtheirus salmonis*) to the infectious copepodid stage and their survival on atypical hosts

Campbell Pert, A. Jennifer Mordue (Luntz) & **Ian Bricknell**

11th International meeting of the EAFP Copenhagen September 2005

Immunostimulants in Aquaculture

**Ian Bricknell**, Tim Bowden & Roy Dalmo

Plenary lecture Aquatech Chile, Puerto Monte August 2005

Sea Lice (*Lepeophtheirus salmonis*) A European problem?

**Ian Bricknell** & James Bron

Plenary lecture Aquatech Chile, Puerto Monte August 2005

Dealing with Emerging Fish Disease: Gadoid Diseases

**Ian Bricknell,** James Bron, Katy Urquhart & Tim Bowden

Plenary lecture Aquatech Chile, Puerto Monte August 2005

Post Settlement Dynamics of the Parasitic Sea Louse, *Lepeophtheirus salmonis* (Copepoda: Caligidae)

Brid O’Shea, A. Jennifer Mordue (Luntz) & **Ian Bricknell**

9th international conference on copepoda, Tunis, Tunisia, July 2005

Sea Lice (*Lepeophtheirus salmonis)* Settlement Success at Low Salinity

**Ian Bricknell**, Sarah Dalesman, Brid O’Shea, Campbell Pert & A. Jennifer Mordue (Luntz)

9th international conference on copepoda, Tunis, Tunisia, July 2005

Growing Sea Lice in the laboratory

**Ian Bricknell** & James Bron

Plenary Lecture

9th international conference on copepoda, Tunis, Tunisia, July 2005

The Use of Genomics, Proteomics and Immunology in Studies of the Parasitic Copepod (*Lepeophtheirus salmonis*)

Fast MD, Bron JE, **Bricknell IR,** Ross NW, Johnson SC

Plenary Lecture

9th international conference on copepoda, Tunis, Tunisia, July 2005

**I.R. Bricknell**

Disease of Gadoid fish: A Review

Plenary Lecture

BMFA VIIth Annual Scientific Meeting

Oban 2-3 November 2004

Disease Of Gadoid Fish In Cultivation: What Do We Know And What Do We Need To Know?

**I.R. Bricknell** & T.J. Bowden

Plenary Lecture

ICES Mariculture of Gadoids Conference

Bergen June 2004

Salmon Lice Settlement Success at Low Salinity

**I.R. Bricknell**, S. Dalesman & J.A. Mordue

6th Sea Lice Conference Huntsman Marine Science Centre St. Andrews New Brunswick Canada June 2003

#### Settlement of Salmon Lice on “Dead End” Hosts

**I.R. Bricknell**, C.C. Pert & J.A. Mordue

6th Sea Lice Conference Huntsman Marine Science Centre St. Andrews New Brunswick Canada June 2003

The physiological environment found in the gut of the sea louse (*L. salmonis*)

**I.R. Bricknell,** J.E. Bron, P. Cook, K. Adamson,A.J. Vigneau, R.S. Raynard and P.F. Billingsley

10th EAFP Meeting Malta September 2003

##### Winner of a 2003 EAFP Best Poster Award

Do Infected Salmon Recruit More Sea Lice, *Lepeophtheirus salmonis*, Than Naïve Fish?

Bríd O’Shea, A.J. Mordue (Luntz) **I.R. Bricknell**

10th EAFP Meeting Malta September 2003

The Fecundity Of The Salmon Louse, *Lepeophtheirus salmonis* and Their Survival On Atypical Hosts

Campbell C. Pert, A. Jennifer Mordue (Luntz) and **Ian R. Bricknell**

10th EAFP Meeting Malta September 2003

Host Preferences of the Salmon Louse, *Lepeophtheirus salmonis*

Bríd O’Shea, A.J. Mordue (Luntz), **I.R. Bricknell**

6th Sea Lice Conference Huntsman Marine Science Centre St. Andrews New Brunswick Canada June 2003

The Impact of Salinity on Survival of *Lepeophtheirus salmonis*

S.Dalesman, **I.R. Bricknell**, C. Pert\* B. O’Shea and A.J. Mordue (Luntz)

6th Sea Lice Conference Huntsman Marine Science Centre St. Andrews New Brunswick Canada June 2003

#### Ready Salted: Salmon Louse Aminopeptidase

A.J. Vigneau, **I.R. Bricknell**, R.S. Raynard and P.F. Billingsley

6th Sea Lice Conference Huntsman Marine Science Centre St. Andrews New Brunswick Canada June 2003

Vaccines Against Sea Lice: A Holy Grail or Just Around the Corner?

###### I.R. Bricknell

Plenary Lecture

ICOPA X Canada House, Vancouver, Canada July 2002