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Biographical information for:

# Dr. George Iwama

**Education**
**Ph.D**. University of British Columbia
**M.Sc.** University of British Columbia
**B.Sc.** University of British Columbia

**Work & Research Experience**

| | |
|---|---|
| 2000-Present | Director General, Natl. Res. Council, Institute for Marine Biosciences |
| 2003-Present | Director General leading the new NRC Institute for Nutrisciences & Health |
| 1996-2000 | Professor of Agricultural Sciences, Univ. Brit. Col. |
| 1991-1996 | Associate Professor Animal Science, Univ. Brit. Col. |
| 1992 | Visiting Foreign Researcher, Biology Dept. Ryukyu Univ. Japan |
| 1993 | Research Faculty, Zoology Dept., Univ. Hawaii, USA |
| 1987-1991 | Assistant Professor, Animal Science, Univ. Brit. Col. |
| 1987 | Postdoctoral Fellow, Dalhousie Univ., Biology, Halifax |
| 1986-1987 | Postdoctoral Fellow, Univ. of Texas, Austin |
| 1985 | Research Scientist, Research Expedition-Ischia, Italy |
| 1984-1985 | Research. Scientist, Max-Planck Inst. Goettingen, Germany |
| 1980-1982 | Extension Biologist, Aquaculture, Gov't of Ontario, Canada |
| 1979-1980 | Biologist Aquaculture, Gov't of Brit. Col., Canada |
| 1974-1978 | Fish Culturist, Kootenay Trout Hatchery, Gov't of Brit. Col. |
| 1976-1977 | Instructor, Douglas College, Vancouver, Canada |
| 1975-1977 | Teaching Asst., Univ. Brit. Col., Zoology, Canada |

**Research Highlights**
**Papers and Chapters in Peer-Reviewed Publications: 118**
**Presentations: 192**
**Graduate Students and Postdoctoral Fellows**

| | Graduate Students | Postdoctoral Fellows, Visiting Scientists |
|---|---|---|
| **Current** | 3 Ph.D. | 1 Research Associate, 2 Visiting Scientists |
| **Past** | 12 Ph.D., 16 M.Sc., | 6 PDFs, 7 Visiting Scientists |

| Granting Agency | Project Title | Funding | Year |
|---|---|---|---|
| AQUANET | Stress in fish: diagnostics, role in disease and Management. | $110,500/year | 2001-2003 |
| AQUANET Co-investigator | Seasonal effect of the, immune function, stress, and metabolism in haddock, and cod (133,900/year). | $7,500/year | 2003-2005 |
| AQUANET Co-investigator | Production of Atlantic salmon with an efficient immune system, and the identification of molecular markers associated with this trait(157,000/year). | $25,000/year | 2004-2005 |
| N.S.E.R.C. (Equipment) | Microplate Reader | $31,191 | 2000 |



**For more information please contact:**
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|---|---|---|---|
| N.S.E.R.C.<br>(Equipment)<br>(Co-PI: team proposal) | Phosphoimager | $117,500 | 2000 |
| Kikkoman Corporation | The Use of Kikkoman Proanthothy anidines to Increase the Efficiency of Salmon Flesh Pigmentation | $ 38,845 total | 1999-2000 |
| N.S.E.R.C.<br>(operating) | The Heat Shock Response in Fish: Energetics and total<br>Physiological Implications | $110,000 | 1998-2002 |
| N.C.E.<br>(Can. Bacterial in Fish Diseases Network) | Stress and Disease Resistance | $383,460 | 1998-2004 |
| Forest Renewal B.C. | Stress and Immune Function in Fish as a function of Riparian Reserve Strips | $ 92,110 | 1996 |
| N.C.E.<br>(Can.Bacterial Diseases Network) | Stress and Disease Resistance in Fish | $473,543 | 1994-1998 |
| N.S.E.R.C.<br>(Operating) | Energetics of Ion Regulation in Fish | $ 72,000 | 1994-1998 |
| NSERC (Strategic Programme) | Stress Protein Expression in Fish | $182,800 | 1992-1994 |
| Canadian Bact. Diseases Network (Research Agreement) | Stress Protein Expression in Fish | $40,000 | 1992-1993 |
| N.S.E.R.C. (Can.Bacterial Diseases Network) | Stress and Disease Resistance in Fish | $452,184 | 1990-94 |
| S.C.B.C. | Simple Indicators of Stress in Fish | $ 47,655<br>$ 45,428<br>$ 43,100 | 1990-<br>1991<br>1992 |
| N.S.E.R.C.<br>(Strategic with D.J. Randall, P.I.) | The Significance Between Hatchery & Wild Fish in Enhancement Programmes | $ 85,000/ yr. | 1988-91 |

**The physiology of stress and disease resistance**. Both finfish and shellfish experience stresses in the wild as well as in aquaculture. While the physiology of the response in shellfish is not well understood, it has been described in some detail for finfish. In finfishes, one of the physiological consequences of being stressed is the release of corticosteroids, such as cortisol, which have been shown to have immunosuppressive effects. Our research efforts in this area concentrate in two main areas: 1) the detailed description of the physiology of the stress response in finfish; and 2) the effects of stress on the natural (non-specific) immunity and the genetic basis for natural immunity in salmonids. We are engaged in a series of experiments to investigate the possible role of heat shock proteins (stress proteins) in the interaction of pathogen and host defense cells in such diseases as bacterial kidney disease, vibriosis, and furunculosis.

**The physiological significance of heat shock proteins (hsps) in fish**. Heat shock proteins have been shown to be expressed in all plant and animal cells that have been stressed. Most of the work was been conducted with cells lines and with mammalian models. These proteins are also expressed in fish cells. We are conducting three streams of projects: 1) the role of hsps in the thermal adaptation of two species of tidepool sculpins; 2) the relationship between stress hormones such as cortisol and adrenaline with heat shock protein levels in tissues of various fish species; and 3) the role of hsps in the induction of tolerance to other stressors (cross-tolerance).



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