

BIOTECHNOLOGY FOR AQUACULTURE: TRANSGENIC SALMON WITH ENHANCED GROWTH AND FREEZE-RESISTANCE

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It is evident that the potential economic benefits of transgenic technology to aquaculture are paramount. The isolation and construction of genes responsible for desirable traits and their transfer to broodstocks could provide a quantum leap over traditional selection and breeding methods. In addition new traits can be transferred to the genome of one fish from an unrelated species, enabling the production of new economically valuable phenotypes. This study summarizes our results on the production of transgenic salmon for growth hormone (GH) and antifreeze protein (AFF) genes.

We have successfully introduced winter flounder AFP genes into Atlantic salmon. These genes are expressed and the AFP secreted into the blood. The inheritance of F₃ suggests that stable lines of AFP transgenic fish was accomplished. Research is underway to increase the AFP level to provide the concentration required for freezing protection.

Using the promoter from the ocean pout AFP gene (opAFP), we have made two GH gene constructs opAFP-GHc (cDNA clone) and opAFP-GHf (GH minigene). GH transgenic salmon are generated with both Atlantic and Pacific Salmon. Several GH transgenics exhibit faster growth rates and increased size. The average transgenic is 4-6 fold larger compared to injected, nontransgenic siblings.

Furthermore, GH mRNA is detected in the liver of transgenics by RT-PCR. Both the large genotype and phenotype are demonstrated in F₁ offspring. Our investigation shows that faster growing and larger salmon can be achieved by gene transfer technology. These studies demonstrate that the technology will be valuable to aquaculture.

Our outgoing research focuses on the development of the disease-resistant transgenic fish and the criteria and methods for bookstock selection. (Supported by NSERC, Canada).

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**Centro de Ingeniería Genética y Biotecnología,
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El Centro de Ingeniería Genética y Biotecnología (CIGB) se complace en invitarle a participar en el VI Curso Internacional Teórico-Práctico de Biología Molecular, que tendrá lugar en las instalaciones del CIGB, en Ciudad de la Habana, Cuba, del 24 al 29 de junio de 1996.

Los temas del Curso comprenden, entre otros: Inmunodetección de proteínas; empleo de sistemas de detección y marcadores no radioactivos (quimioluminiscencia) para ácidos nucleicos y proteínas; hibridación de ADN; secuenciación de ADN; cDNA-PCR; clonaje en T-vector; sistemas de expresión y clonación génica en el diagnóstico y la obtención de antígenos vacunales; mutagénesis del ADN; construcción de bibliotecas genómicas; aplicación de la Biología Molecular en el diagnóstico y la preventión de enfermedades.

La cuota de inscripción es de 450 USD y asegura alojamiento por 7 noches, desayuno, almuerzo y comida.

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