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Fishingicsand: with particular emphasis on finfish and shellfish species

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In this century, marine resources are one of most important targets for biotechnological manipulation toward advanced food production and discovering novel bio-molecules for human welfare. Tremendous progress in molecular genetics or genomics during last decades provides fisheries and aquatic sciences with new tools. It allows us to expect innovated enhancement of productivity and efficiency in fisheries and other related bio-industries. Numerous genomic projects to find useful genetic materials from fish and shellfish species have been actively performed and a number of suggestions have been made to develop desirable fish and shellfish strains through genetic breeding strategies. Recent progress on the understanding the immune system of fish with the information of its relevant genes makes it possible to develop many vaccine strategies and candidate methods for disease controls. Isolation of novel bioactive molecules from marine organisms is also one of important field for marine biotechnology. Biotechnology will also be actively combined with environmental technology with increasing demand on the sustainable biodiversity and clean environment. Now scientists became capable of modifying fish genomethrough many genetic manipulation technologies including transgenesis. We have moved so fast to a new era in which transgenic animals including fish should aid in solving many problems in fields such as food security, public health, livestock improvement and biomedical researches. Transgenic animal models also have played an important role in gaining new insights into the knowledge in many biological fields especially in molecular and developmental research. The wealth of information on fish genes and genomes provided by recent projects including gene discovery, genome sequencing, and functional analysis of genetic materials has added new resources to the field of marine and aquatic biotechnology. This presentation describes our recent activities on the marine and aquatic biotechnology

with particular emphasis on the fish and shellfish biotechnology. It include (1) brief introduction to gene discovery and other related genomic projects, (2) manipulation of fish growth through transgenic technologies, (3) combined genetic breeding of fast-growing transgenic fish and finally (4) on-going research projects and future perspectives.