Construction of Eukaryotic Expression Vector with β-actin Promoter for DNA Vaccine development

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DNA-mediated immunization is one of the latest and simple method for the development of novel vaccines. The eukaryotic expression vector containing the effective promoter system and the antigen gene of the pathogenic organism was constructed as a DNA vaccine and it was introduced into the host with simple intramuscular needle injections.

Iridoviruses are well known as causative agents of serious systemic diseases in many fish species and the iridoviral diseases with high mortalities have been reported in worldwide. In this study, the major capsid protein(MCP) gene of red sea bream iridovirus(RSIV) was used as an antigen and the strong β-actin promoter from rock bream was used as highly expressible promoter system for DNA vaccine development. MCP gene (about 1.4kb) of RSIV was isolated with PCR amplification and cloned into the plasmid vector with the strong β-actin promoter gene(about 1.9kb).

About 100 ㎍ of plasmid vector was injected into rock bream muscle with PBS and promoter group as controls. Boosting was carried out at two weeks after vaccination, and then after two more weeks, the protective effect of the DNA vaccine against RSIV was evaluated with challenge test. Cumulative percent mortality (CPM) was recorded for the detection of antiviral protective immunity following vaccination.

References

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