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TEMASEK LIFESCIENCES LABORATORY

6 January 2020 (Monday), 11am
The Auditorium (Level 1)

Aquaculture health management; multi-factored approach for stable production by prevention, treatment and breeding

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Masato Miyata is a fish researcher with background of fish pathology and molecular biology. Over the last 25 years, Miyata was pursuing his research in fish disease including vaccine development and globin gene regulation. Studied in Japan, worked for Mie University (Japan), Erasmus University Medical Center (The Netherlands), MSD Animal health (Singapore). Currently senior researcher at Temasek Polytechnic (Singapore).

Aquaculture is an urgent subject to secure the protein supply. Fish health management is one of the most important factors to improve the food production efficacy. Key factors: Prevention, treatment and breeding be discussed.

PREVENTION: Brief history of fish vaccine and vaccine development in pharma industry context be shared, followed by a possibility of autogenous vaccine in Singapore.

TREATMENT: Treatment is a therapy after occurrence of disease. Pros-and-cons of antibiotics and vaccine at each growth stage of fish be described. Thereafter, preliminary data and research plan with novel synthetic macromolecules (as a treatment for virus infection) be shown.

FISH BREEDING: Water temperature is high in Singapore. Oxygen level in high temperature water is low as such close to lower limit for fish especially during the daytime. This can be worse by global warming. To pursue fish breeding for a better tolerance to low oxygen, speaker's achievements on fish hemoglobin gene research, and a plan towards gene editing in Asian seabass for upregulating their endogenous fetal hemoglobin genes be shared.

Recent Publications:

1. Jiang J, **Miyata M**, Chan C, Ngoh SY, Liew WC, Saju JM, Ng KS, Wong FS, Lee YS, Chang SF, Orbán L (2014) Differential Transcriptomic Response in the Spleen and Head Kidney Following Vaccination and Infection of Asian Seabass with Streptococcus iniae. PLoS ONE 9(7): e99128. doi:10.1371/journal.pone.0099128
2. de Groof A, Guelen L, Deijs M, van der Wal Y, **Miyata M**, Ng KS, van Grinsven L, Simmelink B, Biermann Y, Grisez L, van Lent J, de Ronde A, Chang SF, Schrier C, van der Hoek L (2015) A Novel Virus Causes Scale Drop Disease in Lates calcarifer. PLoS Pathog 11(8): e1005074. doi:10.1371/journal. ppat.1005074.
3. **Miyata M,** Gillemans N, Hockman D, Demmers D, Cheng JF, Hou J, Salminen M, Fisher CA, Taylor S, Gibbons RJ, Ganis JJ, Zon LI, Grosveld F, Mulugeta E, Sauka-Spengler T, Higgs DR, Philipsen S (2019) An evolutionary ancient mechanism for regulation of hemoglobin expression in vertebrate red cells (under submission)