

## **Hong Kong Branch Distinguished Seminar Series**



Predicting Population Impacts of Oil on A Pelagic Fish Species in the Gulf of Mexico, USA

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Abstract: Risk assessments of environmental contaminants in marine ecosystems have significant degrees of uncertainty associated with predictions of altered biota populations. Usually impacts on populations are based upon laboratory experiments with surrogate species. Adverse outcome pathways have been suggested by USEPA and OECD regulatory bodies as a means to enhance predictability and reduce uncertainties in ecological risk assessments. Utilizing molecular tools in sensitive life stages within organisms known to be adversely affected by oil, predictions of key events throughout biological hierarchies have been made and confirmed with field studies using the pelagic fish species, mahi-mahi (Coryphaena hippurus). Embryonic and larval exposures to oil in laboratory experiments indicated genetic and epigenetic alterations that predicted cardiac and neurobehavioral modifications that were linked to impaired heart function and swimming performance in surviving adults. To confirm these effects noted in laboratory studies, wild-caught adult mahi were exposed to oil for 24 hours on oceanic vessels, and subsequently tracked using pop-up satellite archival tags (PSATs). Transcriptomic analyses of fin clips of the exposed fish indicated the same molecular signatures and physiological predictions observed in laboratory studies with embryos/larvae. Tracking of these animals showed significantly higher mortality due to predation during 7 days after release. In addition, oil-exposed wild mahi did not participate in spawning events indicating behavioral/accelerational modifications which likely impair reproduction and potentially impact population. These data indicate sublethal measurements of molecular responses in exposed animals may reduce uncertainty in predicting impacts of oil on marine fish populations.



10 August 2021 (Tuesday) 4:30-5:30 pm (GMT +8, HK Time)

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