Biosensors for Real-Time Monitoring of Biohazards and Disease in Aquaculture.

Johnston, I[1]; Kaye, R[1]; Munro, I[1]; Tracey, M[1]; Wang, Y[1]; Sucow, B[2]; Klarholz, I[2] & McCluskey, D[1]

1. Centre for Research in Biodetection Technologies | School of Engineering & Technology | University of Hertfordshire | Hatfield | Hertfordshire |AL10 9AB | UK.
2. Technologie-Transfer-Zentrum Bremerhaven, Am Lunedeich 12, D-27572, Bremerhaven Germany.

Early, reliable and systematic detection of waterborne chemical and biological pathogens is critical to prevent the spread of disease in aquaculture by enabling effective management practices. Laboratory-based technologies are available for reliable pest/pathogen/disease detection and these are likely to remain as the 'gold standard' for confirmation of the serious pathogens of fish and shellfish. However, there is significant value in the development of technology that will provide reliable early warning of pathogens in the field and rugged farm environments in real-time to help direct a more targeted program of pathogen surveillance by the competent authorities when it is needed most.

We present our research towards fieldable integrated analysis platforms for the detection of bacteria and viral pathogens within EnviGuard: A European consortium of reseach engineers, marine scientists, aquaculture companies, shellfish and fish farmers whose objective is to develop a fully automated, integrated system for detection and monitoring of harmful algae blooms (HAB), chemical contaminants, viruses and toxins.

Our system will provide significant decision-making support to the aquaculture industry and has the potential to facilitate rapid introduction of movement restrictions to prevent disease spread, triggering emergency harvests and/or early culling to reduce the impact on both the environment and business operations.