

Biomedical Laboratory Scientists in Cross Disciplinary Research

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After graduation biomedical laboratory scientists have many choices when it comes to employment. Biomedical laboratory scientists (BLS) work in medical laboratories in hospitals, in various specialty laboratories, and some choose to continue with their education, or pursue research. While most BLS work in medical laboratories, they are highly attractive to other industries as well, like pharmaceutical laboratories, quality control in food production and research. BLS have many skills that are important to maintain high quality and reproducibility and include training in microbiology, pathology and clinical chemistry enables them to contribute to research and development in the perspective of “One health.”

The World Health Organization (WHO) has defined the term “One health” as “an integrated, unifying approach to balance and optimize the health of people, animals and the environment.” The goal is to raise awareness on how production of food and animal health impacts the human population, especially within infectious diseases and biosafety in food production. Biosafety in food production is highly regulated, and there is extensive on-going research to ensure a high level of biosafety, but also to provide high quality food products to consumers.

Among the various research and development projects we find projects that target novel approaches to disinfection strategies to prevent infectious diseases and reduce the use of antimicrobials in aquaculture and agriculture. The use of antimicrobials in aquaculture and agriculture contribute to antimicrobial resistance among food borne pathogens. The “one health” strategy is to reduce the use of antimicrobials in food production. The perspectives from BLS staff in these research projects link medical microbiology and health perspective with the knowledge from both veterinary medicine and industrial production, thus giving the project outcome a broader audience.

As a BLS researcher, I contribute to one of these projects called “RAS health” - a project that targets biosecurity in land-based aquaculture with the aim to improve water treatment methods using ozone (O₃) and peracetic acid (PAA) and increase biosecurity by adopting disinfection strategies that consider the disease vectors and reservoirs of pathogens. This technology enables large-scale food production in an environment where biosafety can easily be monitored.

Norway is one of the largest producers of salmonid fish served in a global market. The use of antibiotics in Norwegian aquaculture are very low, but the global aquaculture industry consumes large quantities of antibiotics annually. New approaches to biosafety in food production will help fulfill the United Nations (2015) sustainability goal 2; End hunger, achieve food security and improved nutrition and promote sustainable agriculture.

The RAS health project is a cross-disciplinary research project and includes researchers from the Norwegian Food Research Institute (NOFIMA), and the universities, Norwegian University of Sciences and Technology, Norwegian University of Life Sciences and Danish Technical University. Three perspectives are included: animal health, chemical analysis, and microbiology. From the microbiology perspective both pathogen detection and microbiome analysis are used to study the role of commensal microbiome in pathogen outbreaks and understand how novel disinfection strategies affect microbiome resilience and pathogen dynamics. This is crucial when the microbiome serves a critical function in maintaining water quality and for the health and wellbeing of the animals. Biosafety and microbiome resilience has been investigated in two different settings, one in a high technology production system with modern sensor- and water disinfection systems. The other is aquaculture ponds, with low technology solutions. This is much like aquaculture sites in developing countries, which makes this study relevant to provide recommendation for biosafety strategies beyond high technology solutions. This could provide a long-term solution, enable the reduction of antimicrobials globally, and potentially provide solutions for safe food production on a small scale.

From a biomedical laboratory scientist perspective, I highly recommend other BLS with research interests to get involved in research projects that will put our BLS knowledge and expertise into new contexts. It is both challenging and educational to participate in cross-disciplinary research. Many topics that impact human health can benefit from the high standards of BLS knowledge and BLS have many skills needed to achieve the goals of “One health”.

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