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SHORT TERM MISSIONS

Short Term Missions (STMs) are small travel grants with the aim of:

- Sharing scientific expertise, methodologies, equipment and facilities to harmonise the existing approaches and methodologies within the large
- OHEJP European network Driving the research forward in a collaborative and non-duplicative fashion to strengthen both the scientific capacity within the OHEJP
- Contributing to the future prevention, preparedness, detection and response of the EU to foodborne and other emerging threats across human-animal-environmental sectors.

Construction of dual labelled *E. coli* strains to study the effect of antibiotics and microbiota interventions on the horizontal transfer of ESBL genes in the *in vitro* chicken caecal microbiota



Theme:
Home Institute:
Mission Hosting Institute:
Duration of Mission:

One Health Missions - Antimicrobial Resistance (AMR)
Wageningen Bioveterinary Research (WUR), The Netherlands
University of Copenhagen, Denmark
2 months

The aim of this mission was for the PhD student to learn bacterial cloning methods using fluorescent reporter proteins, to produce dual labelled *E. coli* strains. Dual labelling (fluorescent tagging of the chromosome and AMR-gene carrying plasmids) of bacteria is a powerful tool to study plasmid-mediated antimicrobial resistance among complex *in vitro* microbial communities simulated on *in vitro* gut systems like the chicken caeca. This STM enabled the PhD student to reach the objectives proposed in the OHEJP PhD project VIMOGUT, which studies the chicken gut microbiota and microbiota interventions to reduce horizontal transmission of Extended Spectrum β -Lactam (ESBL) genes.

During this mission, five commensal ESBL *E. coli* strains that originated from chicken broiler caeca and belonged to the collection of The Dutch National Reference Lab were used for bacterial cloning experiments. All strains carried an ESBL (blaCTXM-1 and blaSHV-12) or AmpC β -lactamase (blaCMY-2) gene on plasmids highly prevalent in the broilers production and were susceptible to three antimicrobials. Two fluorescent reporter proteins were used for chromosome and plasmid tagging, namely, mCherry and Green fluorescent protein (GFP). Bacterial cloning is a challenging research area that requires time and repeatability of the experimental work. Technical issues and challenges were encountered during this multi-step process. However, the PhD student learned the bacterial cloning techniques needed for the completion of future *in vitro* experiments and developed and strengthened her lab skills.

The STM opened significant cooperation channels between the AMR group at Wageningen Bioveterinary Research and the One Health Antimicrobial Resistance (OHAR) research group at the University of Copenhagen. The output of the work performed during the STM, and upcoming *in vitro* experiments are expected to be published as a collaborative research article in a scientific journal.

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A short term mission should be a must-do for all young researchers! It was a priceless experience that enriched my knowledge and skillsets and expanded my network. I built up and exercised my lab skills, critical thinking and cooperation in a multidisciplinary group. I was challenged daily with new knowledge and experimental work but also strongly supported by a wonderful work team!”

Ingrid Cardenas Rey
Wageningen Bioveterinary Research,
The Netherlands



@OneHealthEJP



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