

Work Package 8: Therapeutics

BioCop will address the issue of veterinary drug residues in food by developing novel screening tools for two chemical classes of interest: fluoroquinolone antibiotics and hormone growth promoters.

Fluoroquinolone antibiotics



The overuse and/or illegal use of fluoroquinolone antibiotics in animal production is of particular concern to humans. Repeated exposure to these antibiotics via the food chain will limit the future effectiveness of these drugs due to the build up of antimicrobial resistance. BioCop will develop improved rapid diagnostic methods to screen for the presence of low concentrations of the entire family of fluoroquinolone antibiotics in animal products, for example in chicken muscle, eggs and fish.

Following the development of the multi-fluoroquinolone biosensor assay, the activities of the WP will be directed towards validation and small-scale inter-laboratory testing. Finally, demonstration activities, with emphasis on the EU network of residue laboratories, will be organised.

In addition, the fluoroquinolone case will form an example for advanced sample preparation development based on aptamers. Aptamers are short pieces of synthetic DNA or RNA which fold in such a way that they can recognise ligands, thus providing a biorecognition-based selective extraction option (see figure 1).

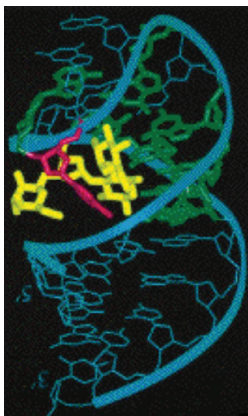


Figure 1: An example of aptamer folding

Hormone growth promoters



Hormone growth promoters are banned for use in cattle fattening in the EU. Hormone abuse is a concern in the EU from a law enforcement, food safety, and an animal welfare perspective.

Residues of hormones in meat can be a potential health threat, especially for vulnerable people such as pre-adolescents. All hormonally active substances were banned by 96/22/EC regulation, but a black list of substances does not exist.

Enforcement of such a ban is extremely expensive: in theory, screening methods should be capable of detecting an unlimited number of hormonal substances. An increasing number of instrumental multi-residue screening methods are being used. Analysis is expensive and consequently sample numbers remain relatively low, thus providing only a limited degree of consumer protection against hormone residues in food. There is an urgent need for a fast screening method, which is capable of detecting potential hormone abuse. The costly analytical methods can then be focussed on the samples of real interest, identified through rapid screening.

BioCop will address this problem by developing a protein-biomarker-based biosensor assay for blood samples. The biomarkers will be identified by the proteomics work package (WP2). It is anticipated that the response of a set of biomarkers to hormone treatment versus an untreated reference group of animals can provide a novel way of differentiating between potentially illegally treated and untreated animals. Moreover, treatment with newly developed illegal designer steroids might also be traceable using biomarker screening. This concept will be supported by classical hormone residue analysis data in urine samples from the same animals.



Work Package Leader:

Dr. Michel Nielen

RIKILT - Institute of Food Safety - Netherlands

michel.nielen@wur.nl

Deputy Work Package Leader:

Dr. Stefan Weigel

WEJ/Eurofins - Germany

stefan.weigel@wej.de

Participants List:

RIKILT-Institute of Food Safety – Netherlands

WEJ/Eurofins – Germany

University of Utrecht –Netherlands

University of Liège – Belgium

National Veterinary School – France

Centre d' Économie Rurale – Belgium

Queens University Belfast – United Kingdom

Health Canada – Canada

EU-CRL Antibiotics Residues: AFSSA – France

EU-CRL Hormone Residues: RIVM – Netherlands

