

**AKKERMANSIA MUCINIPHILA ANTIMICROBIAL SUSCEPTIBILITY PROFILE**

Joana Cristina Barbosa <sup>(1)</sup> - Daniela Machado <sup>(1)</sup> - Diana Almeida <sup>(1)</sup> - José Carlos Andrade <sup>(2)</sup> - Ana Cristina Freitas <sup>(1)</sup> - Ana Maria Gomes <sup>(1)</sup>  
*Universidade Católica Portuguesa, CBQF - Centro de Biotecnologia e Química Fina – Laboratório Associado, Escola Superior de Biotecnologia, Porto, Portugal* <sup>(1)</sup> - *CESPU, Instituto de Investigação e Formação Avançada em Ciências e Tecnologias da Saúde, Paredes, Portugal* <sup>(2)</sup>

**Objective:**

This study aims to characterize the antimicrobial susceptibility profile of *Akkermansia muciniphila* DSM 22959, a human commensal and next-generation probiotic candidate, using phenotypic and *in silico* analyses.

**Methods:**

**Phenotypic antibiotic susceptibility assessment:** *A. muciniphila* DSM 22959 was grown in PYGM medium and subcultured at least twice before use. Minimum inhibitory concentration was determined for 8 clinically relevant antimicrobials, as recommended by EFSA-FEEDAP, using broth microdilution and E-test<sup>®</sup> methods. Both assays were performed at least with three independent replicates and with technical duplicates.

**In silico analysis:** Antimicrobial resistance genes (ARG), virulence factors (VF), genomic islands (GI) and mobile genetic elements (MGE) were predicted in *A. muciniphila* DSM 22959 whole genome (accession number: NZ\_CP042830.1) using several available databases and bioinformatics tools.

**Results:**

Phenotypically, *A. muciniphila* DSM 22959 shows susceptibility to ampicillin, tetracycline, colistin and fosfomicin and is resistant to gentamycin, kanamycin, streptomycin (aminoglycosides) and ciprofloxacin. *Akkermansia muciniphila* contains 26 annotated ARG that support the observed resistance profile. Other ARG might not be expressed under the tested conditions. Most ARG and VF are not embedded within GI or MGE. No plasmids were reported for this strain.

**Conclusions:**

The same susceptibility categorization was obtained in both phenotypic methods. The phenotypic resistance profile is supported by the genomic context. However, there is no evidence of horizontal acquisition or potential transferability of the identified ARG and VF. Thus, the antimicrobial susceptibility profile of the probiotic candidate *A. muciniphila* DSM 22959 meets the safety criteria required to be considered for human consumption.

**HAFNIA ALVEI HA4597 IMPROVES WEIGHT LOSS IN OVERWEIGHT SUBJECTS UNDER HYPOCALORIC DIET: A DOUBLE-BLIND, RANDOMIZED PLACEBO-CONTROLLED STUDY**

Dechelotte Pierre <sup>(1)</sup> - Breton Jonathan <sup>(1)</sup> - Trotin Picolet Clementine <sup>(2)</sup> - Grube Barbara <sup>(3)</sup> - Erlenbeck Constantin <sup>(4)</sup> - Bothe Gordana <sup>(4)</sup> - Fetissov Serguei <sup>(5)</sup> - Gregory Lambert <sup>(2)</sup>  
*Rouen University, Inserm UMR 1073, Rouen, France* <sup>(1)</sup> - *TargEDys, R&D, Longjumeau, France* <sup>(2)</sup> - *Practice, General medicine, Berlin, Germany* <sup>(3)</sup> - *Analyse & Realize GmbH, Clinical, Berlin, Germany* <sup>(4)</sup> - *Rouen University, Inserm UMR 1239, Rouen, France* <sup>(5)</sup>

**Objective:**

After *Hafnia alvei* HA4597 proved able to produce Caseinolytic peptidase B (ClpB), a peptide mimicking the satiety hormone alpha-MSH and showed promising results on the reduction of food intake and body weight gain in mice models of obesity (Lucas et al., 2020, Legrand et al., 2020), the objective was to investigate the probiotic strain's efficacy in weight reduction and metabolic health parameters in overweight adults.

**Methods:**

236 overweight adults were included in this 12-week prospective study. They received standardized counselling for a -20% hypocaloric diet. Subjects of the HA group received 2 capsules per day providing 100 billion bacteria, while the placebo group received 2 capsules of placebo. The primary outcome was the proportion of responders, defined as subjects who lost at least 3% of baseline body weight at 12 weeks.

**Results:**

The proportion of responders was significantly superior in the HA group (57,7%) compared to the placebo group (41,7%). In addition, the reduction in Body Mass Index (BMI), hip circumference and fasting glycemia were significantly greater in the probiotic group. The feeling of fullness and the global satisfaction were also greater in the HA group.

**Conclusions:**

A 12 week supplementation with HA4597 significantly improves weight loss, feeling of fullness and glycemia levels in overweight subjects under hypocaloric diet. These data support the use of *Hafnia alvei* HA4597 in the global management of excess weight.