

A collection of cultured gut bacteria opens new research avenues

Aachen, Dec. 15, 2020 – When it comes to health, the gut deserves special attention, as it is home to a large proportion of immune cells our , which interact closely with complex communities of microbes (the gut microbiota). This is true not only for humans, but also for many animals. The Clavel lab at the Institute of Medical Microbiology of the RWTH Aachen University Hospital has now described the intestinal microbiome of pigs using a combination of cultivation and (meta)genomic approaches. The study was published in the renowned journal *Nature Communications*.

One to two thirds of the prokaryotic diversity within the intestine of mammals has not yet been described. This hampers microbiome-based applications in animal models for both biomedical research and agriculture. To fill this knowledge gap, Prof. Dr. rer. nat Thomas Clavel and his team have analyzed the intestinal microbiota of pigs, thereby culturing and describing many novel bacterial groups (taxa) and their functions.

The resulting collection includes 110 species across 40 families and nine bacterial phyla. It provides taxonomic descriptions for 22 novel species and 16 genera. Meta-analysis of 16S rRNA amplicon sequence data and metagenome-assembled genomes reveals widespread and swine-specific species within *Lactobacillus*, *Streptococcus*, *Clostridium*, *Desulfovibrio*, *Enterococcus*, *Fusobacterium*, and several novel genera. Potentially important functions discovered in these organisms include a new fucosyltransferase, with possible biotechnological applications for the biosynthesis of synthetic oligosaccharides, and widespread gene clusters encoding sactipeptide-like peptides with potential antimicrobial properties.

This public collection serves as a foundation for experimental studies aimed at understanding the ecology of the gut microbiota as well as investigating microbe-host interactions using *in vitro* and *in vivo* systems. In addition, the team is exploring the use of synthetic bacterial communities to improve animal health, an approach also followed in humans.

The resource, called the *Pig intestinal bacterial collection (PiBAC)*, can be accessed at www.dsmz.de/pibac.

Pressekontakt:

Uniklinik RWTH Aachen
Dr. Mathias Brandstädter
Leitung Unternehmenskommunikation
Pauwelsstraße 30
52074 Aachen
Telefon: 0241 80-89893
Fax: 0241 80-3389893
mbrandstaedter@ukaachen.de

Über die Uniklinik RWTH Aachen (AöR)

Die Uniklinik RWTH Aachen verbindet als Supramaximalversorger patientenorientierte Medizin und Pflege, Lehre sowie Forschung auf internationalem Niveau. Mit 36 Fachkliniken, 28 Instituten und sechs fachübergreifenden Einheiten deckt die Uniklinik das gesamte medizinische Spektrum ab. Hervorragend qualifizierte Teams aus Ärzten, Pflegern und Wissenschaftlern setzen sich kompetent für die Gesundheit der Patienten ein. Die Bündelung von Krankenversorgung, Forschung und Lehre in einem Zentralgebäude bietet beste Voraussetzungen für einen intensiven interdisziplinären Austausch und eine enge klinische und wissenschaftliche Vernetzung. Rund 8.000 Mitarbeiterinnen und Mitarbeiter sorgen für patientenorientierte Medizin und eine Pflege nach anerkannten Qualitätsstandards. Die Uniklinik versorgt mit 1.400 Betten rund 50.000 stationäre und 200.000 ambulante Fälle im Jahr.