# RESEARCH AREA III
# HIGHLIGHT

## 01
## TITLE OF THE WORK

Role of microbiota in shaping asthma susceptibility.

## 02
## SOME BACKGROUND

Asthma is a heterogeneous disease leading to various phenotypes. It is assumed that the complex interaction of host genetics, the host´s microbiome and early environmental influences influence the risk of asthma development. While host genetics are stable, the microbiome is dynamic and thus offers opportunities for therapeutic manipulation.

## 03
## WHAT DID SCIENTISTS DISCOVER?

Applying the identical House Dust Mite (HDM) treatment scheme in four different mouse strains did lead to distinct phenotypic manifestations of "asthma" in the strains. Additionally, a pilot study using 16S ribosomal RNA (rRNA) sequencing revealed slight differences in microbial composition of lung microbiome among the different mouse strains.

## 04
## WHY IS IT IMPORTANT?

The prevalence of asthma has been rapidly increasing in affluent countries in the last decades, placing a hugh burden on the health care system with still growing costs. Factors that might have an impact are: genetic background, air pollution and the so called "western lifestyle". However, the underlying causes for this rapid rise cannot be explained by genomic changes as these would require many generations to be manifested. Thus, it can be presumed that the microbiome is more dynamic than genetics and will rapidly adapt to this new environment, probably caused by life-style changes.

## 05
## WHO DID THE RESEARCH?

**Joni Lund** [a]
**Sabine Bartel** [a]
**Susanne Krauss-Etschmann** [a,b]

[a] – Early Life Origins of CLD, Research Center Borstel, Germany

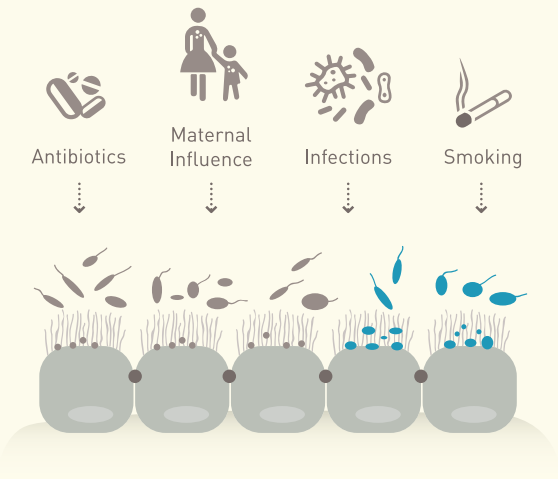
[b] – Experimental Asthma Research, University of Kiel, Germany

## 06
## WHY DID THEY CHOOSE THE DESCRIBED METHODS?

The 16S rRNA sequencing approach is the gold standard used for the classification and identification of microbial composition, by using universal primers for the conserved region of the hypervariable gene region, identifying also uncultivable bacteria. Using animal models allows minimizing external influences and exposures, which are of highly relevant for microbiome research and reproducibility of experiments.

## 07
## DETAILS FOR SCIENTISTS – PUBLICATION

A publication describing the phenotypes, sensitization patterns and microbiomes of the different mouse strain is currently prepared




**Epithelium – Microbiota Interaction**

→ **ASTHMA RISK?**