

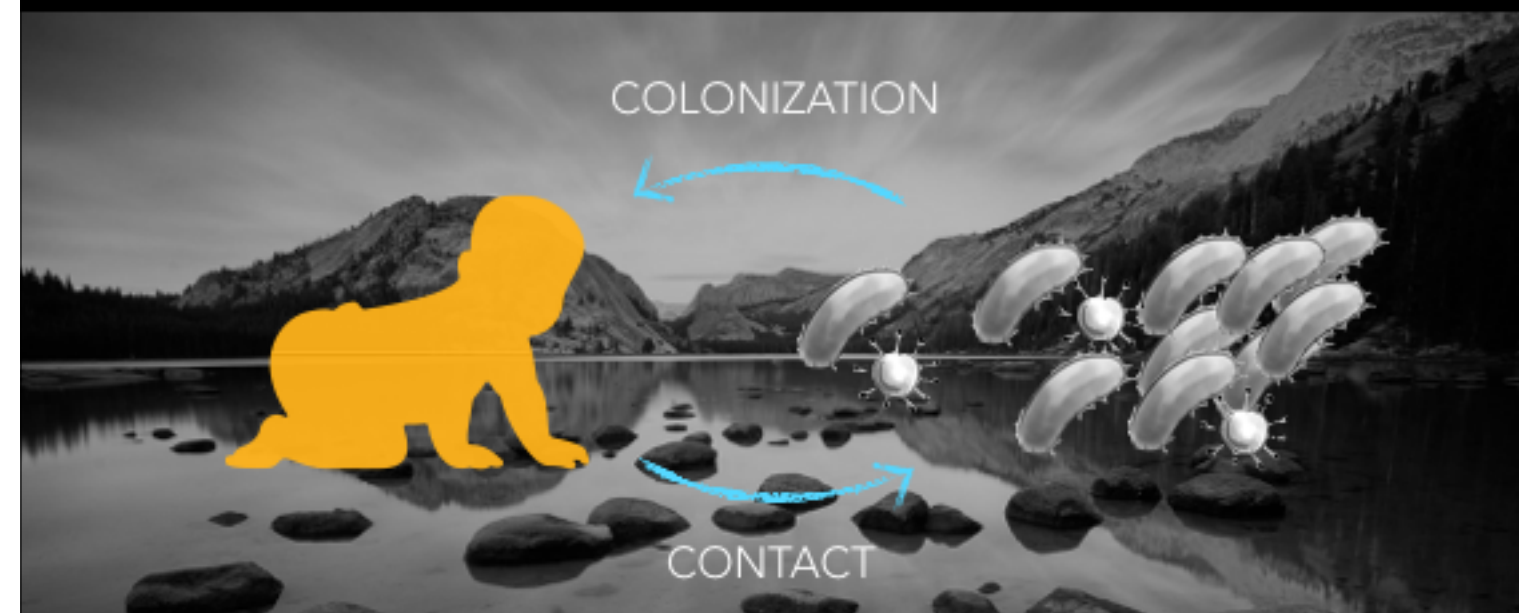
# THE RICH & THE POOR



WHY CONTACT WITH MICROBIAL BIODIVERSITY IS SO IMPORTANT?

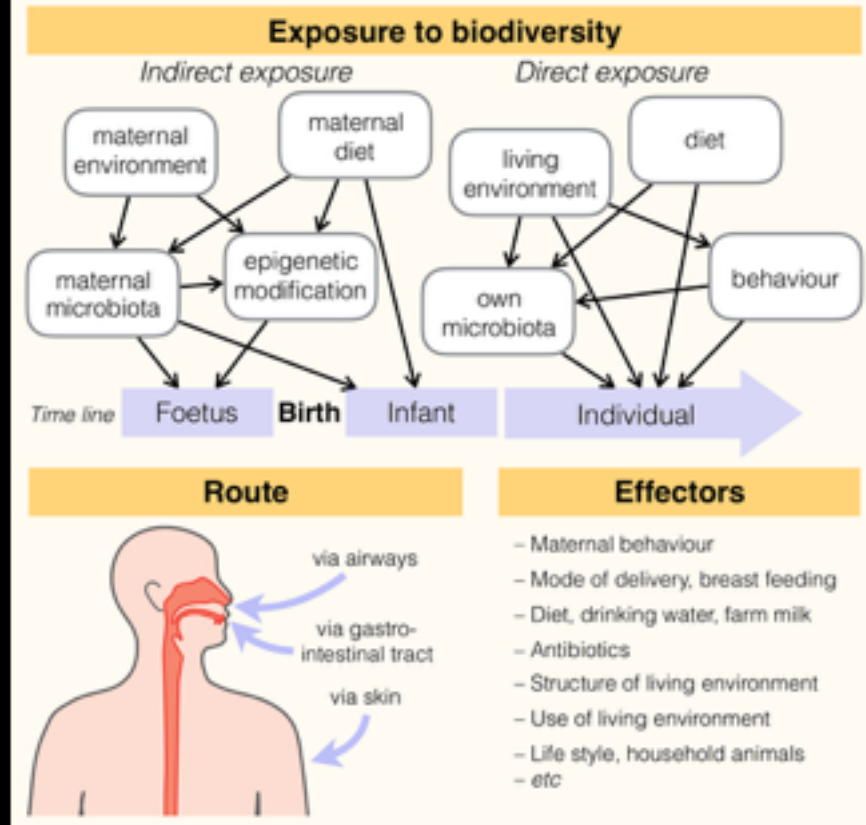
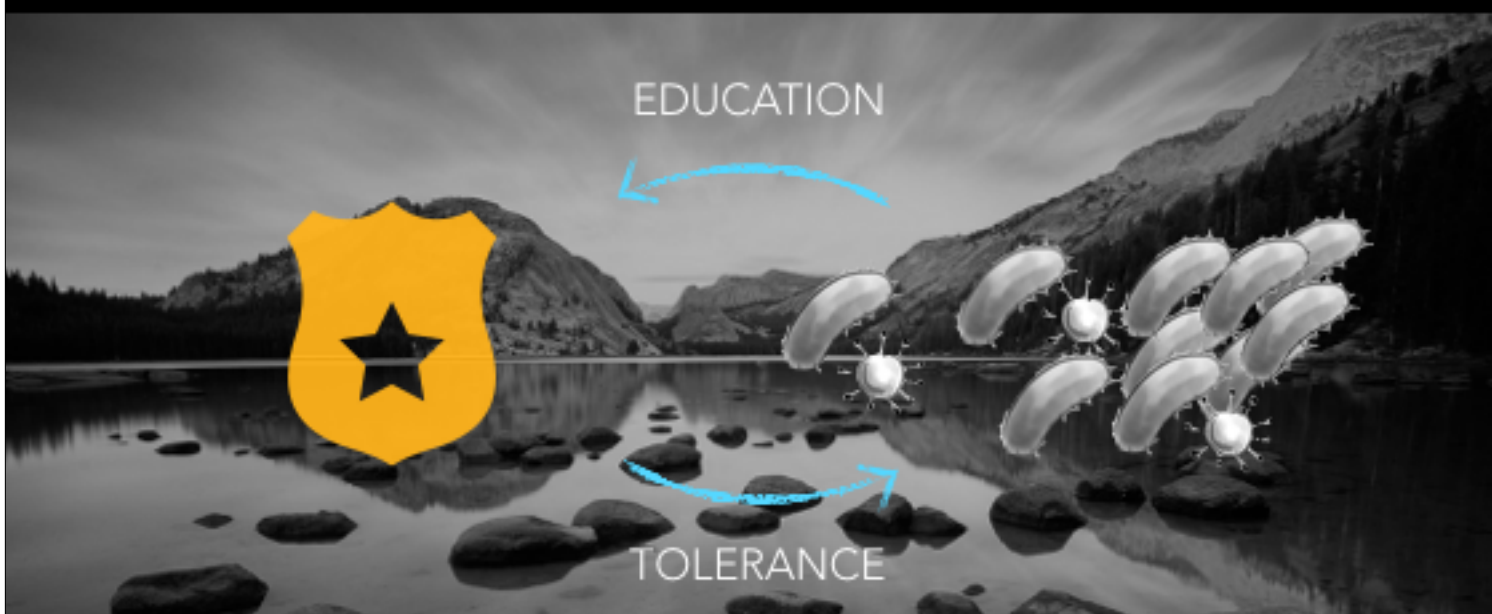
THE BIODIVERSITY HYPOTHESIS

# THEORY



THE BIODIVERSITY HYPOTHESIS

# THEORY



THE BIODIVERSITY HYPOTHESIS

# EVIDENCE

- In 2011 Hanski *et al.* suggested that two global mega-trends, loss of biodiversity and the increase in inflammatory disorders could be related
- Since then, we have been gathering evidence to test this **biodiversity hypothesis** of allergic disease

MODEL STUDIES



HUMAN STUDIES



THE RICH & THE POOR

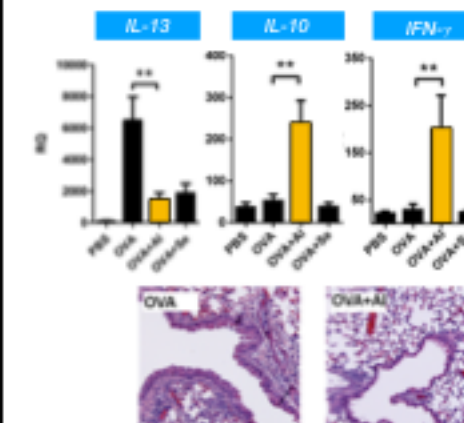
# MODEL STUDIES



Fyhrquist *et al.* 2014. JACI



Skin bacteria differ in their immune-regulatory potentia. *Acinetobacter* in skin can have a systemic, anti-inflammatory effect.



Local immune regulation in skin

Systemic alleviation of lung inflammation

THE RICH & THE POOR

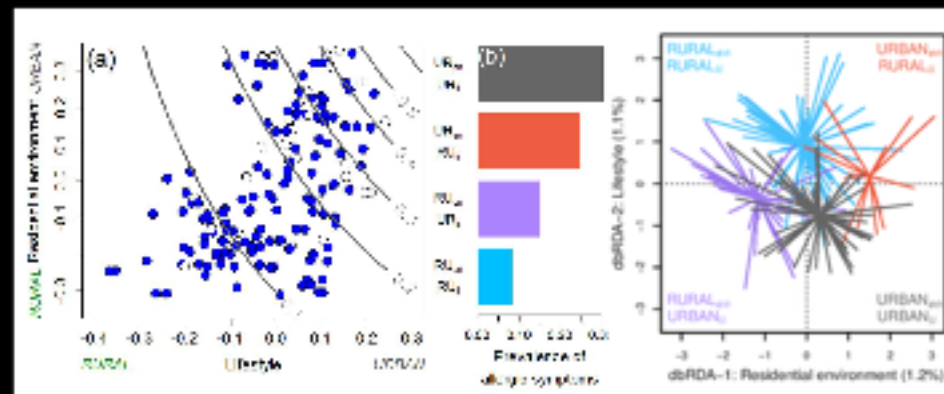
# MODEL STUDIES



Lehtimäki *et al.* 2018. PNAS



The living **environment** and **lifestyle** shape skin microbiota. Microbiota associates with allergy.



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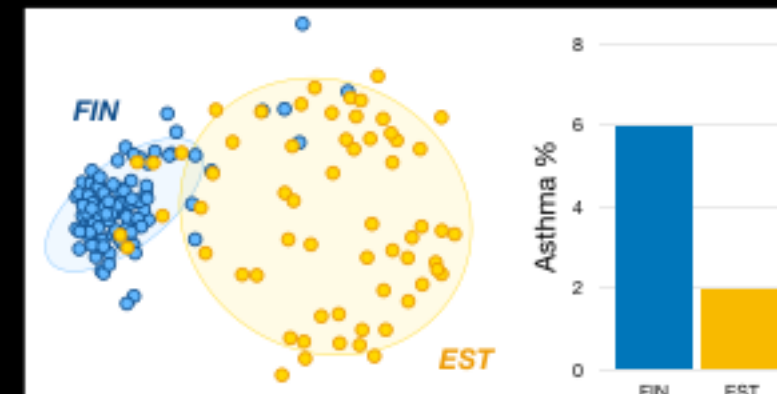
# HUMAN STUDIES



Ruokolainen *et al.* 2018. Unpubl.




Geographically adjacent populations, having different lifestyles, differ in both their microbiota and health




THE RICH & THE POOR

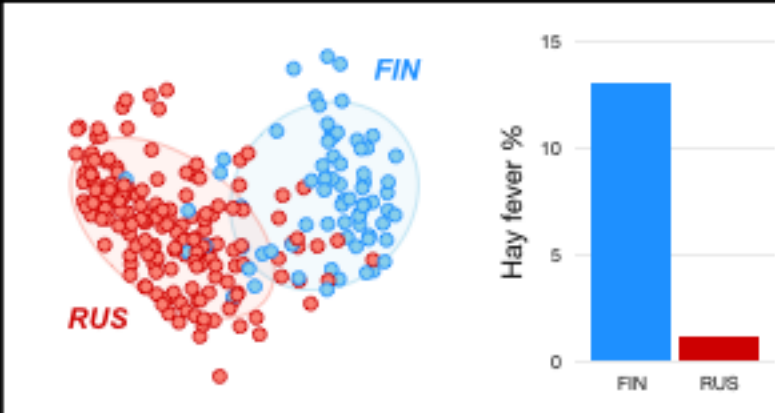
# HUMAN STUDIES



Ruokolainen et al. 2017. CEA



Geographically adjacent populations, having different lifestyles, differ in both their microbiota and health



The scatter plot shows two clusters of points: a red cluster labeled 'RUS' and a blue cluster labeled 'FIN'. The bar chart shows the percentage of hay fever cases: FIN is approximately 13% and RUS is approximately 1%.

Population	Hay fever %
FIN	~13
RUS	~1

THE RICH

SPEND THEIR TIME IN CLOSE CONTACT WITH NATURAL MICROBIOTA



THE POOR

ARE SURROUNDED BY ARTIFICIAL SURFACES, WHERE HUMAN ASSOCIATED MICROBIOTA IS OVERREPRESENTED



THE RICH AND THE POOR



The illustration shows a tree where the leaves are various colored microorganisms. Below the tree are silhouettes of people and animals: a family (man, woman, child) on the left, and a family (man, woman, child) with a cow and a dog on the right.



*"There is no other biodiversity with which we are equally connected than the biodiversity on our skin and in our gut, but this biodiversity may be less independent of environmental biodiversity than we think. We are the innermost doll in a Russian matryoshka, protected by 2 layers of biodiversity." Ilkka Hanski*

THANK YOU

