





# Measurement of the human gut microbiome

Aline Potiron, IAS festival, 19/05/2026



Utrecht  
University

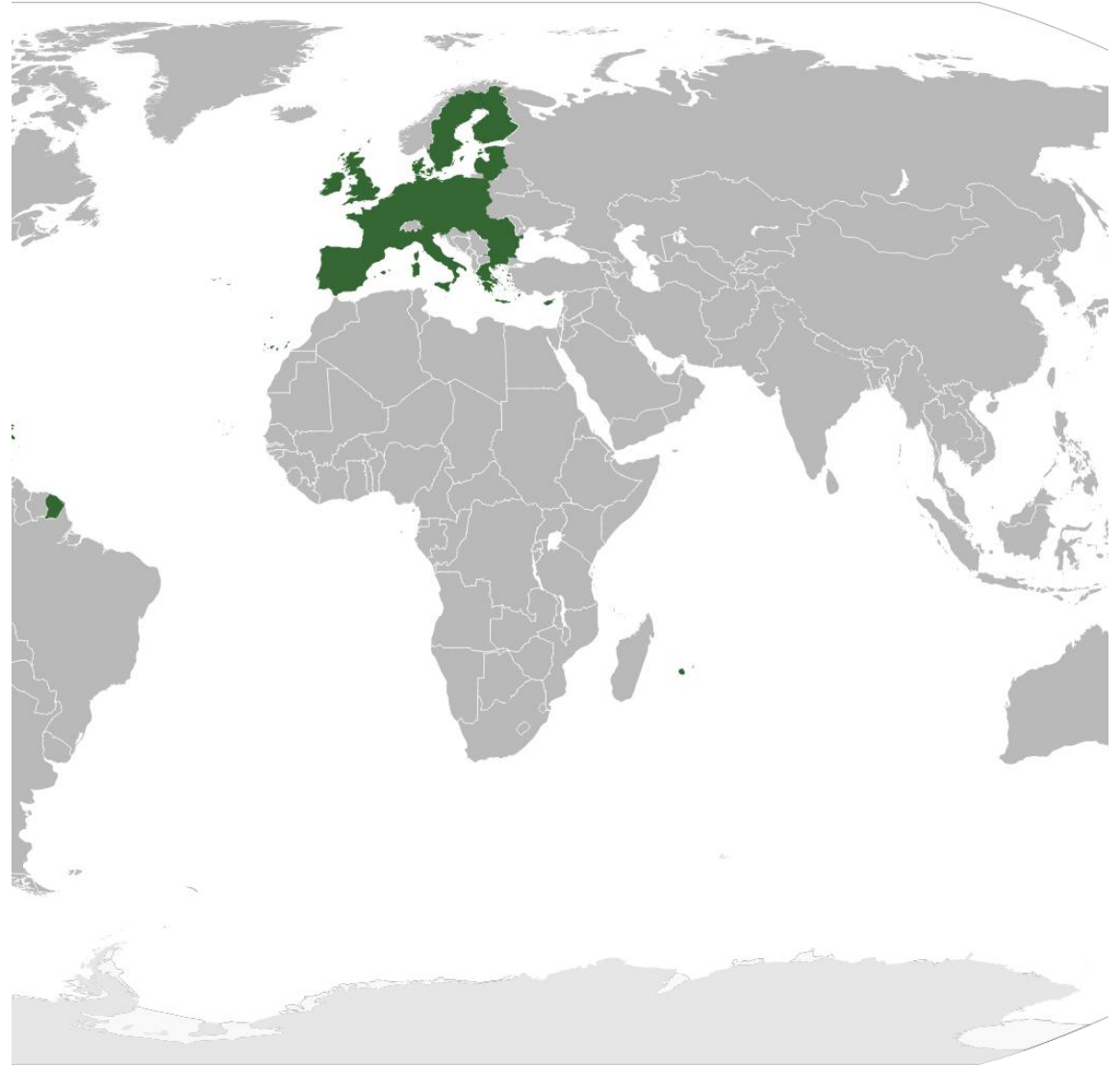


# Positionality Statement

- Positionality: an individual's worldview and the stance they take in relation to research and its context (Holmes, 2020).

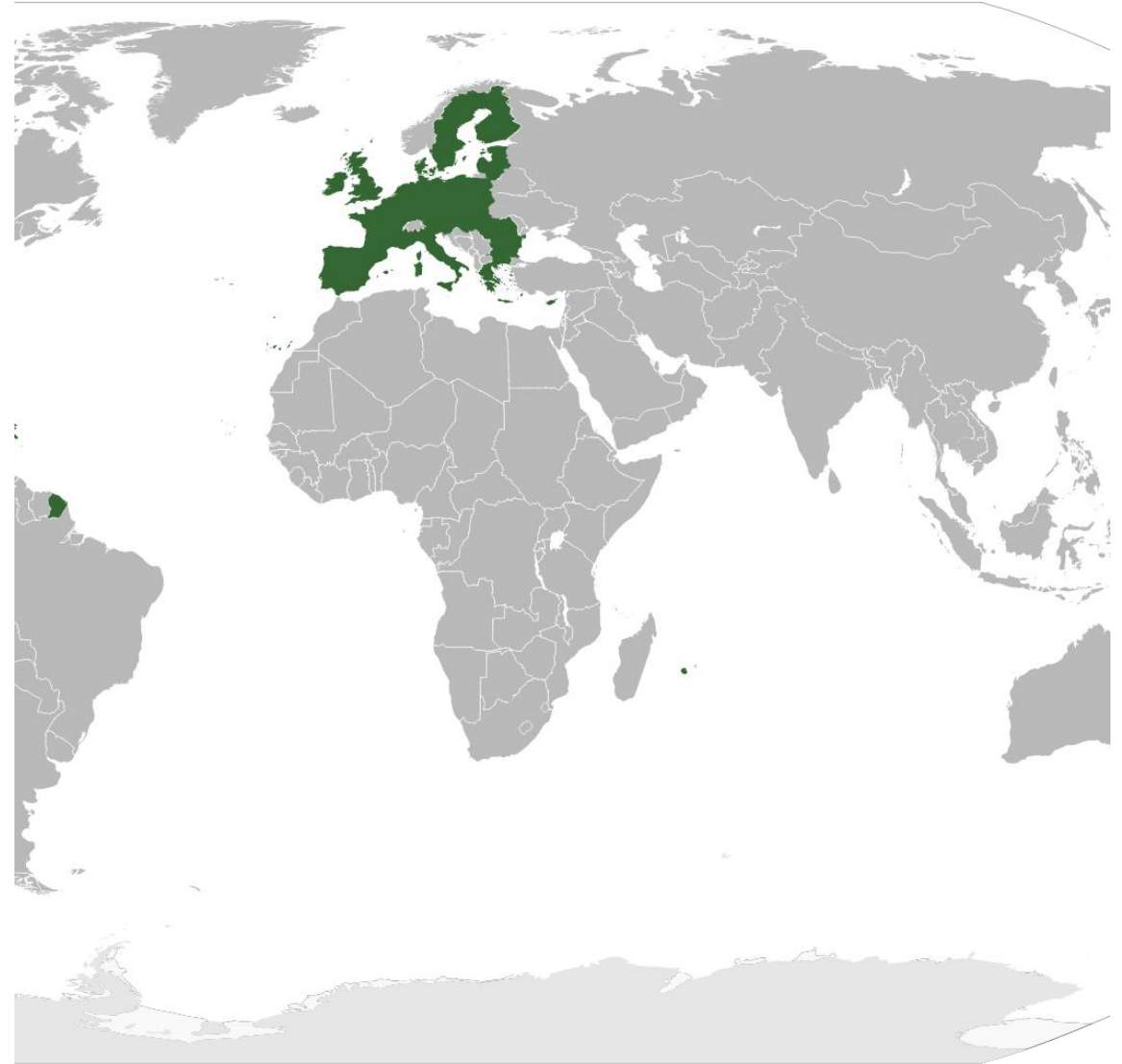
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- **White French woman who spent most of her professional life in Europe.**
- **Biases:**
  - My vision and definition of race.
  - My racial experiences are also biased, as I am part of one of the most privileged populations.



A scanning electron micrograph (SEM) showing a dense population of rod-shaped bacteria. The bacteria are green in color and have a textured, slightly irregular surface. They are oriented in various directions, some parallel to each other and others at angles. The background is dark, making the green bacteria stand out. The word "Introduction" is overlaid in white text in the center of the image.

# Introduction



Microbiomes

# Human Categorizations in Microbiomes

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# Problems with measuring race/ethnicity:



What is the **inferential power** of ethno-racial categories in the context of targeting the **microbiome for personalized medicine**?

1. **Which concept to use?** The definitions of ethno-racial categories are imprecise, creating **epistemic uncertainty**.
2. **What is measured exactly – what is the “measurand”?** These categories **reduce multiple dimensions** into one category, which can result in **stereotyping and essentializing ethno-racial categories through the microbiome**.
3. **How to operationalize?** *The instability of these categories makes them useless for treating a particular individual.*



# 1. Which concept to use?

Image by [WalterClark](#) from [Pixabay](#)

# Epistemic Uncertainty

01

Studies often **use interchangeably different concepts** such as “race,” “ethnicity,” “geography,” and “nationality.”

02

Few studies **define** these terms before using them, or **do not use them consistently** throughout one paper.

03

When institutional or more general definitions backed up such papers, those **definitions are not consistent globally and depend mainly on the location of the researchers.**

04

This situation prevents **comparative analyses** of different studies and **hinders scientific communication.**

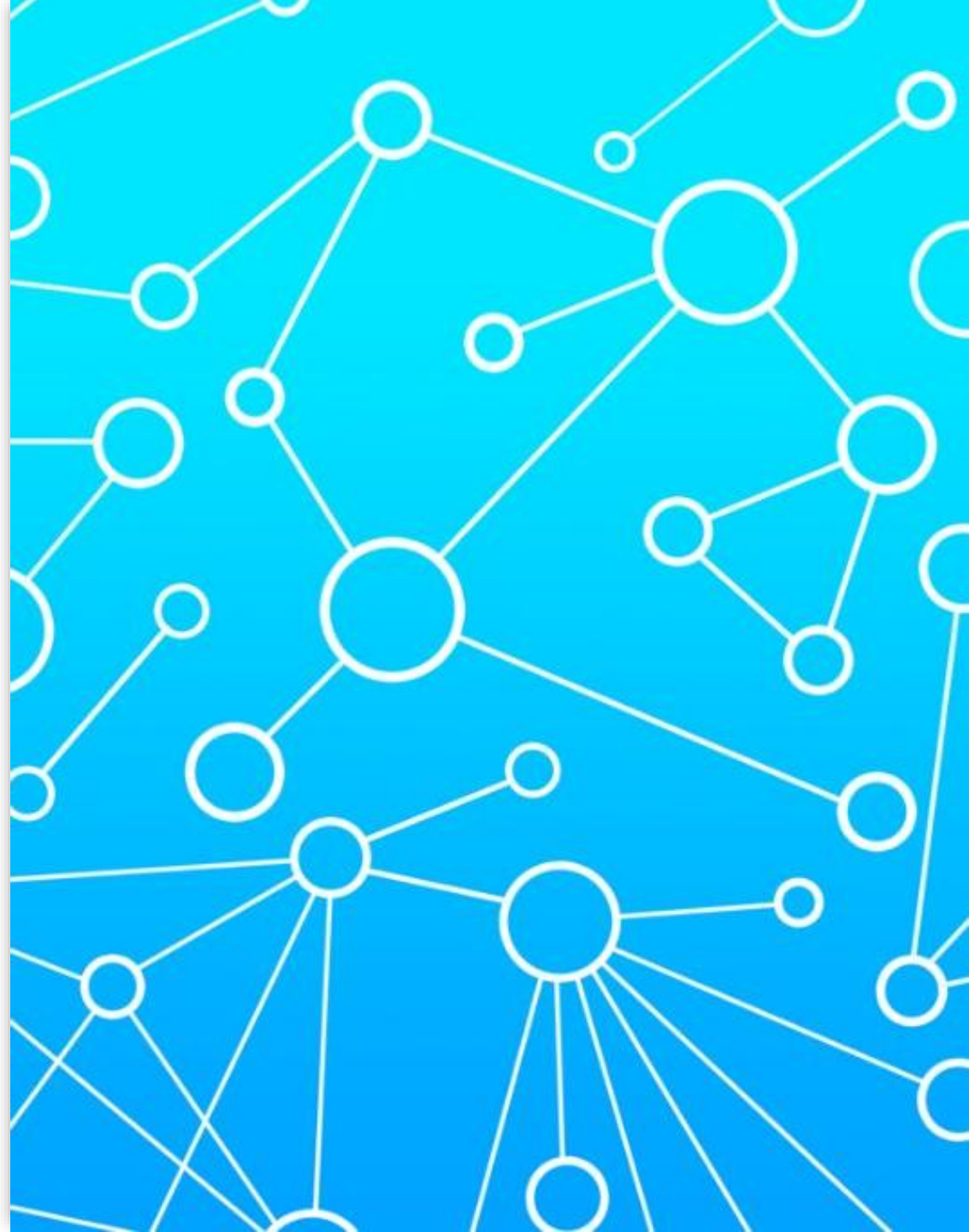


## 2. What is measured?

Image by [Felipe](#) from [Pixabay](#)

# Reduction of Multiple Dimensions

- Ethno-racial categories **reduce multiple dimensions**, including human genetic diversity, diet, and socio-cultural dimensions, into one category.
- **Method** (ongoing):
  - Focus groups of scientists based in Germany, South Africa, Mexico and Colombia specializing in microbiome studies.
  - Causal Network (**Fuzzy Cognitive Maps**)

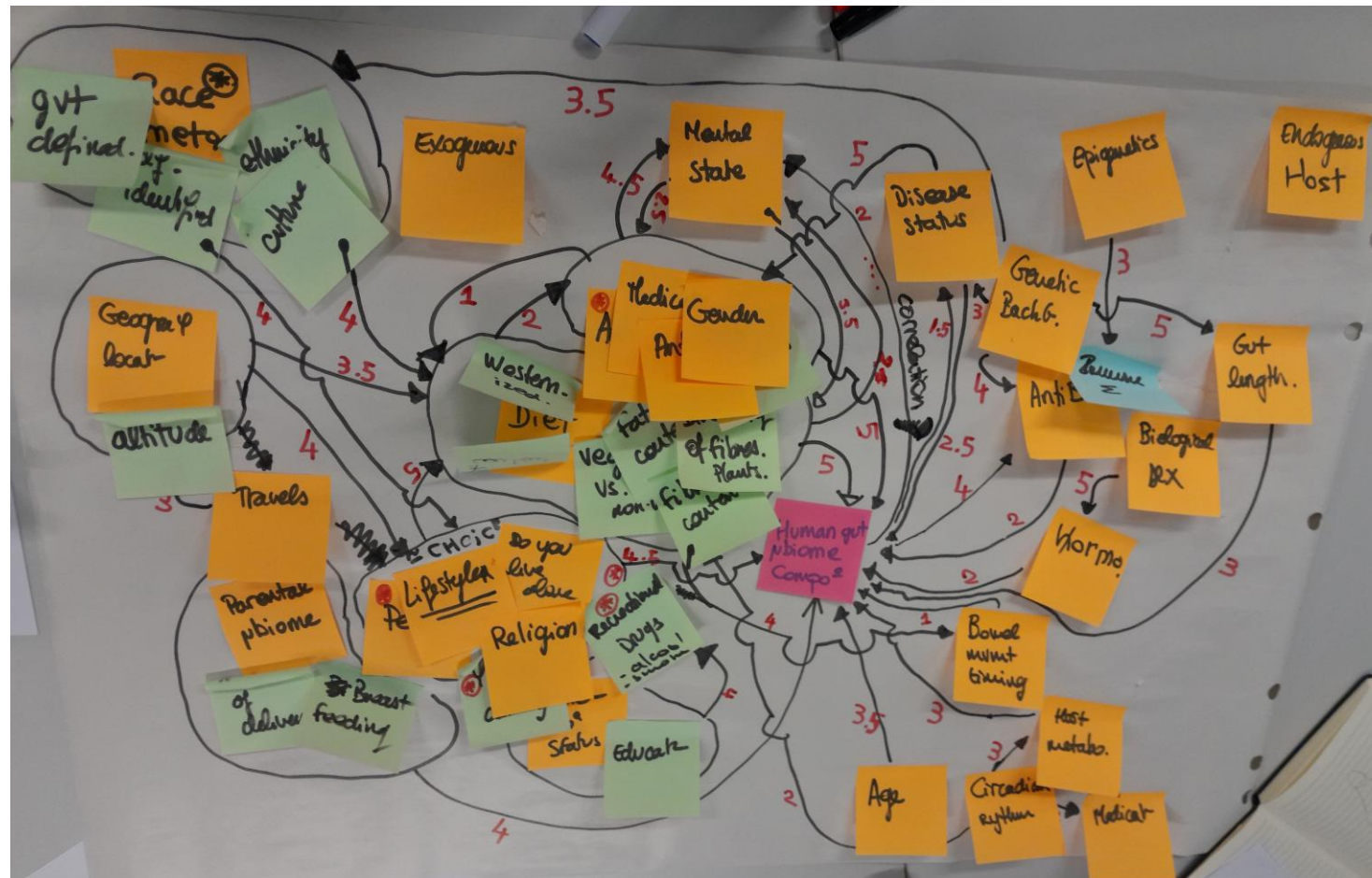


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# Reduction of Multiple Dimensions

- “race”: An **umbrella term** for government-decided, self-identification, culture, and ethnicity.
- **Unclear variables of interest**
- Confusion in cause-effect relationships:  
**Uncertainty about the causal role (if any) of the racial category**



# Going forward...

- There is no straightforward, stable and consistent way of measuring “race” or “ethnicity” in microbiome studies.
- The risks of using ethno-racial categories in microbiome studies, including **poor scientific communication**, attributing a **spurious causal role** to these categories, **stereotyping**, and **misplacing individuals** into categories that may not be relevant for treatment or risk-factor assessment, **outweigh any potential benefits**.
- Instead, researchers should focus on the **actual variables** they are interested in, such as **diet**, to avoid racist descriptions and the microbiomization of ethno-racial categories.

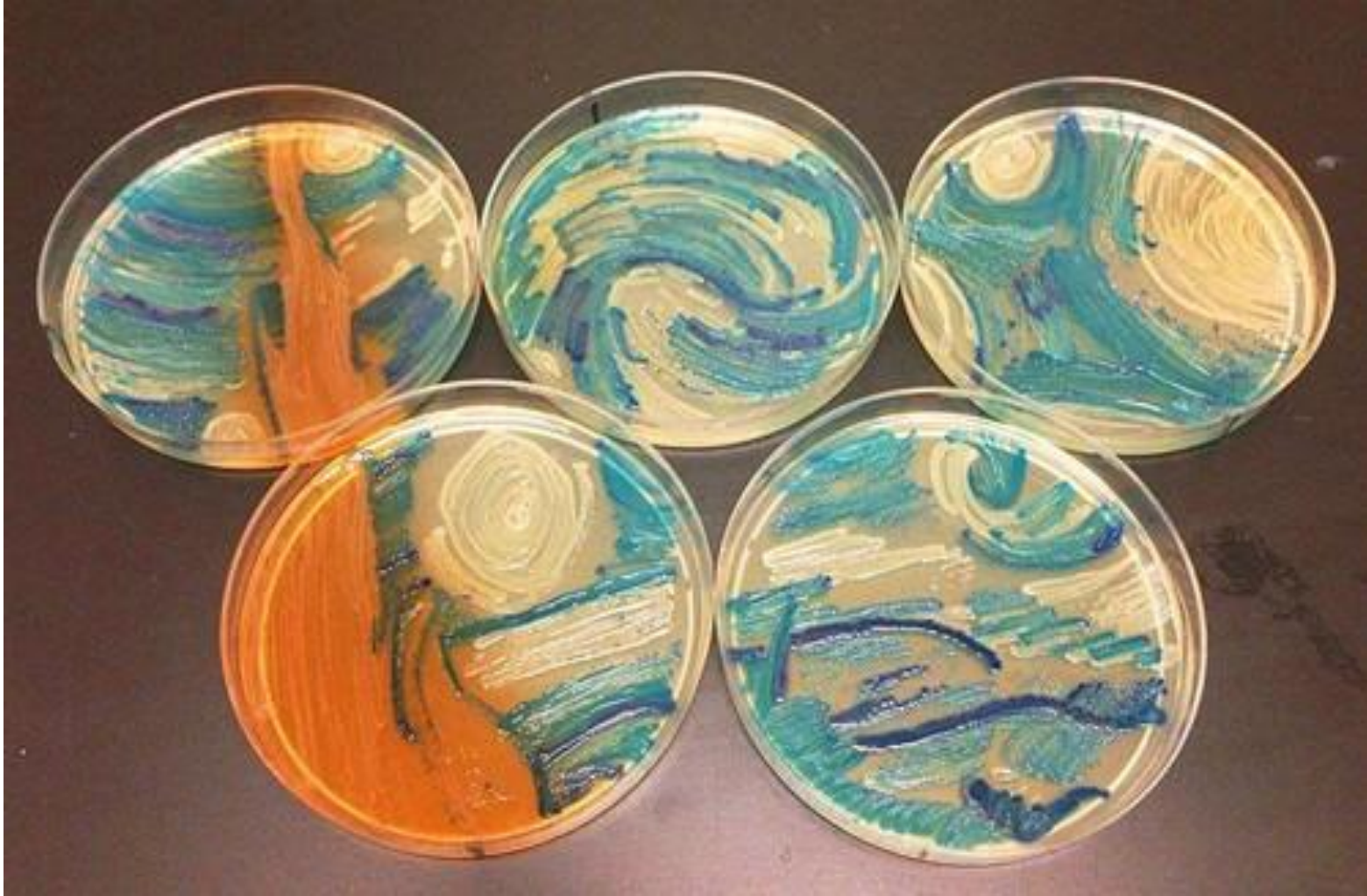


# Microbiome Research and Race in the “Local South”



Utrecht  
University





Thank you!

Vincent van Gogh's "The Starry Night" by Melanie Sullivan of Missouri. *American Society of Microbiology.*

# Conceptual Imprecision

Articles	Terms employed	Define (not explicitly) as
Amato et al. (2021)	Race and ethnicity	“Structurally imposed differences in lifestyle and environmental factors”, often associated with ancestry
Borello et al. (2022)	Race and ethnicity	Proxy for diet
Brooks et al. (2018)	Ethnicity	Self-declared, aspects of human genetic variation, social, economic and cultural variations
Deschasaux et al. (2018)	Ethnicity	HELIUS definition, people with same “diet, lifestyle, or genetics”, Western and non-Western
Gaulke and Sharpton (2018)	Ethnicity	Genetic diversity, geography
Syromyatnikov et al. (2022)	Race and ethnicity	Genetic diversity, living conditions, nationalities, and religions