

#### 16SrRNA Intermediate Bioinformatics Online Course: Int\_BT\_2019

### **Module 2:**

## Introduction to the microbiome - why 16S?

**Part 2.3** 











Contents lists available at ScienceDirect

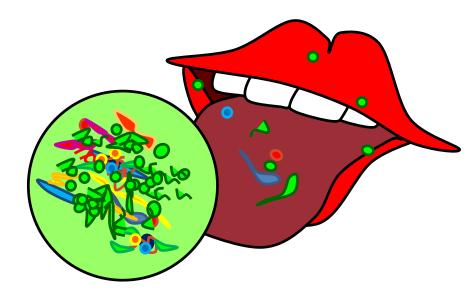
#### **Immunology Letters**





The oral microbiome and the immunobiology of periodontal disease and caries

Massimo Costalonga a,\*, Mark C. Herzberg b,c

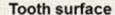












Streptococcus mutans, Actinomyces, Eubacterium,

Peptostrepptococcus

#### Tonsil

Streptococcus viridans, Neisseria species,— Haemophilus influenzae, coagulase-negative Staphylococci

#### Tongue

Veillonella atypica,
Porphyronas gingivalis,
Selenomonas species,
Actinobacillus
actinomycetemcomitans,
Prevotella intermedia,
Capnocytophaga species,
Streptococcus faecalis,
Eikenella corrodens

#### Gingival crevice

Fusobacterium, Prevotella, Porphyromonas

#### Oropharyngeal region

Streptococcus salivarius, Streptococcus mutans, Streptococcus anginosus, Streptococcus pyogenes, Streptococcus pneumoniae, Haemophilus influenza, Haemophilus parainfluenzae

#### **Dental plaque**

Actinomyces, Rothia, Kocuria, Arsenicicoccus, Microbacterium, Propionibacterium, Mycobacterium, Dietzia, Turicella, Corynebacterium, Bifidobacterium, Scardovia, Parascardovia

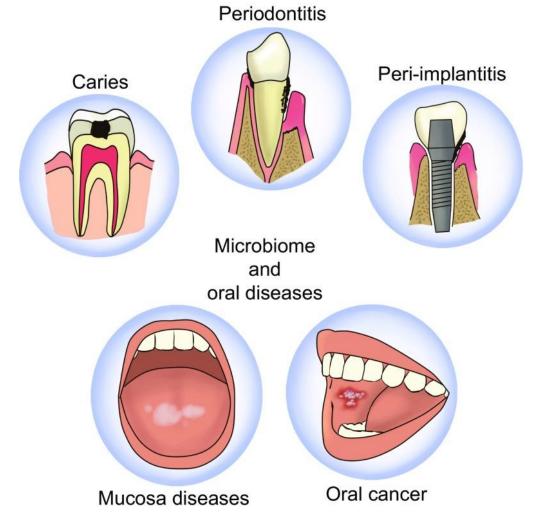
Lim et al 2017. Theranostics; 7(17):4313-4321. doi:10.7150/thno.21804











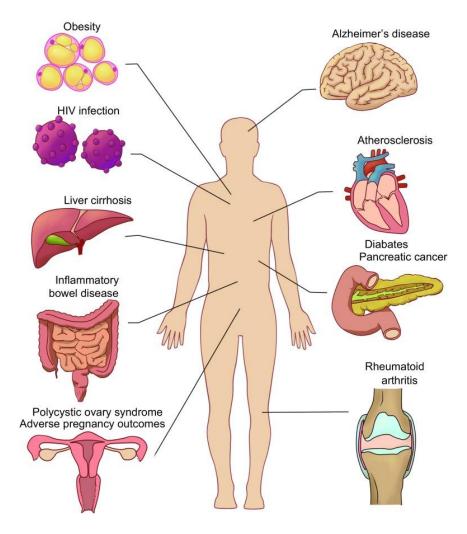
Gao et al. 2018. Protein Cell. May; 9(5): 488-500. doi: 10.1007/s13238-018-0548-1











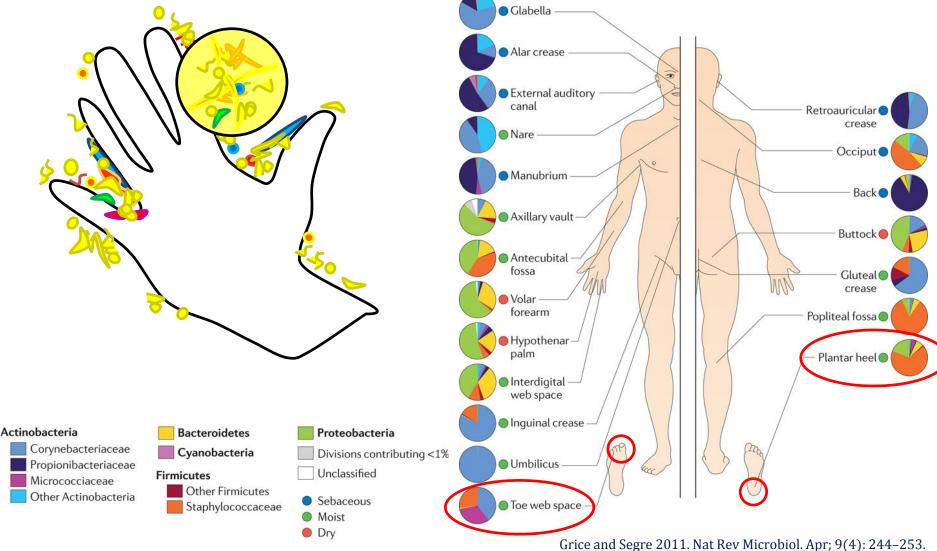
Gao et al. 2018. Protein Cell. May; 9(5): 488-500. doi: 10.1007/s13238-018-0548-1











doi: 10.1038/nrmicro2537

**16SrRNA Intermediate Bioinformatics Online Course:** 

Int BT 2019 **Shantelle Claassen-Weitz** 

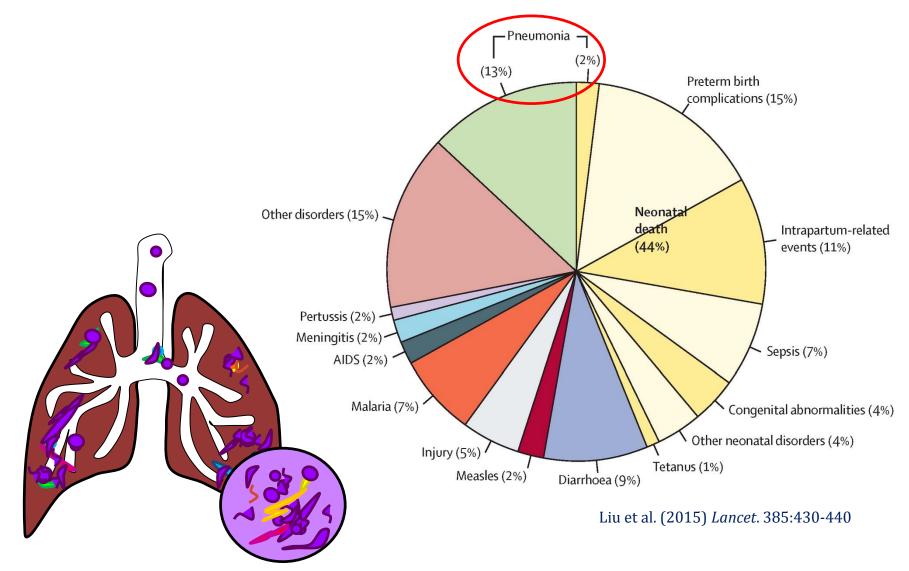
Pan African Bioinformatics Network for H3Africa

**H3ABioNet** 







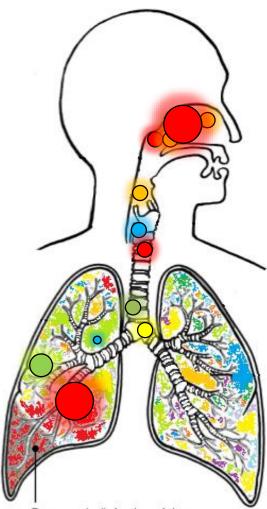












Pneumonia (infection of the alveoli and surrounding lung)

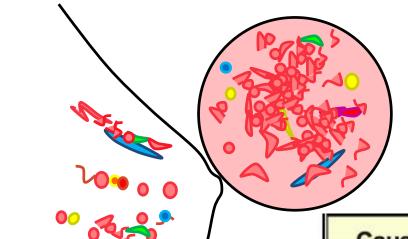
Dicksonet al. (2014) Lancet Respir Med. 2(3):238-246; Dickson and Huffnagle (2015) PLoS Pathog. 11(7): e1004923



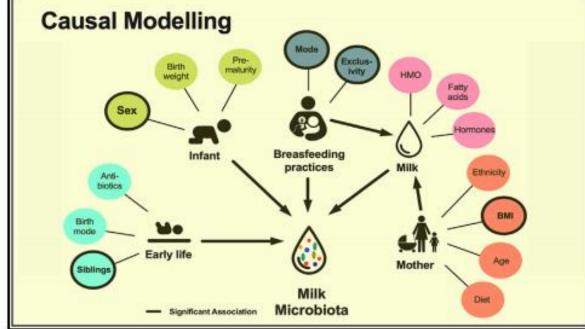








Moossavi et al. 2019. Cell Host Microbe. Feb 13;25(2):324-335.e4. doi: 10.1016/j.chom.2019.01.011

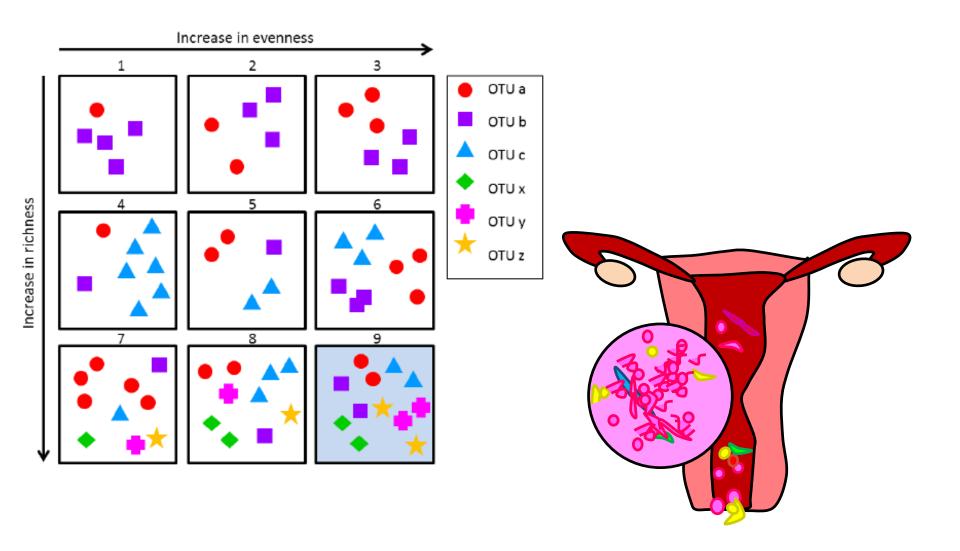




















Bacterial vaginosis +

Diverse microbial profiles

Bacterial vaginosis -

Dominated by 2

Lactobacillus

species:
L. crispatus or L.

iners

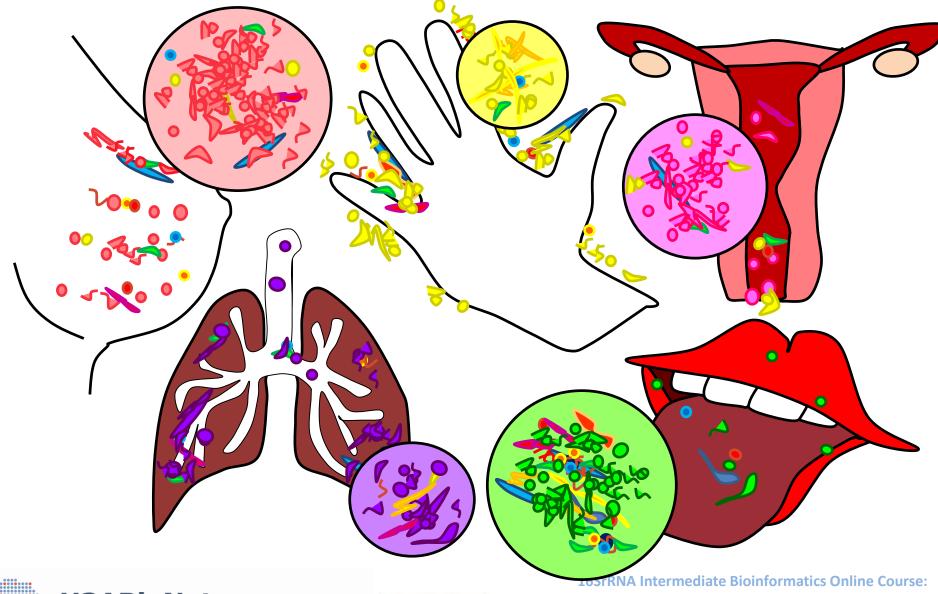
Srinivasan eta al 2012. Plos One. https://doi.org/10.1371/journal.pone.0037818







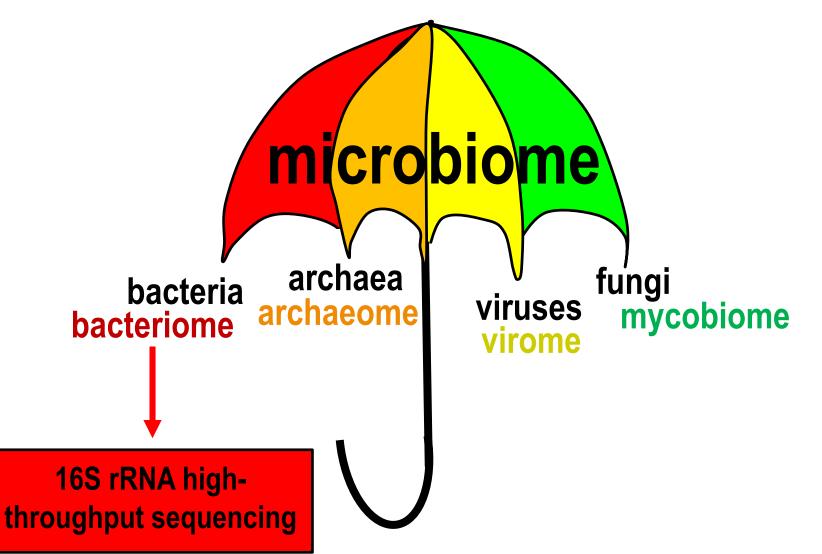










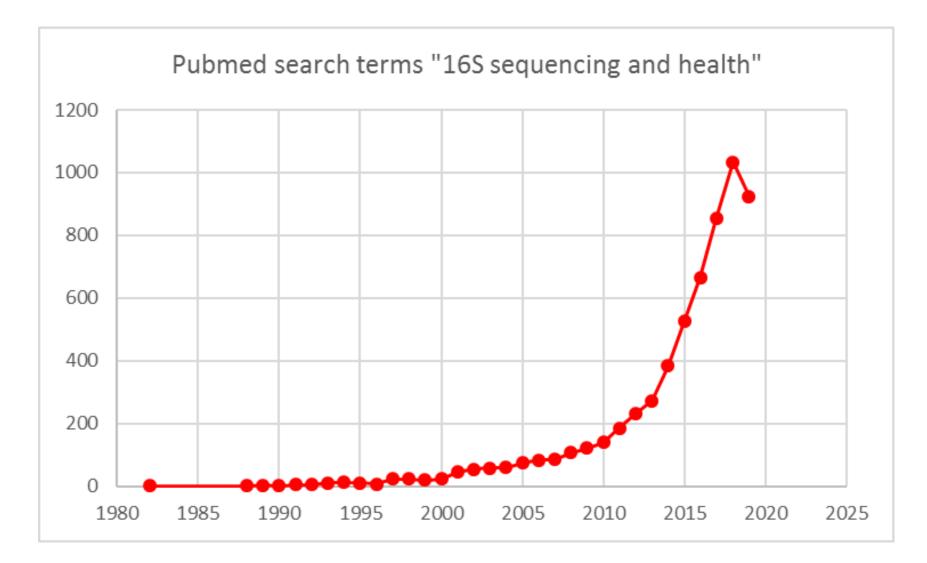




















#### In summary:

- Microbial communities exist outside the human GIT.
- A number of studies have shown that microbial communities detected at different body sites are associated with health and disease states.
- Microbial communities are different for different body sites and we even find different communities within different topographies of the same body site.
- The term "microbial diversity" is defined as the number of different organisms and how evenly they are distributed within an environment.
- The term "microbiome" is an umbrella term for a number of microscopic organisms (which includes bacteria) detected in any given environment.
- 16S rRNA high-throughput sequencing is used to study the bacteriome / bacterial profiles within any given environment.







## Module 2:



# Introduction to the microbiome – why 16S?

