

- as of 2014, whole metagenomic sequencing data for ~800 healthy human cohort samples obtained; 16S sequence data from ~5,000 healthy human cohort samples
- information gained may shed light on complex interactions between microbes and humans in both healthy and diseased states

Normal Microbiota of the Human Body Adapt to Many Sites

Normal Microbiota of the Human Body

- Normal microbiota or microflora
 - microbes regularly found at an anatomical site
- Relationship begins at birth
 - varies with environment and food source
 - *Bifidobacteria*
 - found in breast fed babies
 - protrophic – can synthesize all amino acids and growth factors from simple carbohydrates

Microbial Diversity – Innate and Environmental Factors

Reasons to Study Normal Human Microbiota

- To gain insight into possible infections resulting from injury
- To understand causes and consequences of overgrowth of microbes normally absent from a body site
- To increase awareness of role played by indigenous microbes in stimulating immune response

The Relationship between Normal Microbiota and the Host

- Usually mutually beneficial
 - normal microbiota often prevent colonization by pathogens
 - bacterial products, e.g., vitamins B and K are beneficial to the host
- Opportunistic pathogens
 - members of normal microbiota that produce disease under certain circumstances
- Compromised host
 - debilitated host with lowered resistance to infection

Skin

- Commensal microbes include both resident and transient microbiota
- Mechanically strong barrier
- Inhospitable environment
 - slightly acidic pH
 - high concentration of NaCl
 - many areas low in moisture
- Inhibitory substances (e.g. lysozyme, cathelicidins)

Acne Vulgaris

- Caused in part by activities of *Propionibacterium acnes*
 - sebum
 - fluid secreted by oil glands
 - accumulates, providing hospitable environment for *P. acnes*
 - comedo
 - plug of sebum and keratin in duct of oil gland