- **Oral cavity**
  - The oral cavity acts as a **complex, heterogenous microbial habitat**
  - Saliva in the oral cavity contains antimicrobial enzymes such as **lysozyme and lactoperoxidase**
    - High concentrations of nutrients near the mouth surface however promote the growth of bacteria
  - **Dental plaque** is the result of the extensive growth of microorganisms, especially *Streptococci*
    - As the plaque develops, **anaerobic bacteria begin to grow**, these produce high amounts of acid that result in the **decalcification of the tooth**
      - *Streptococcus sobrinus* and *Streptococcus mutans* are both lactic acid bacteria
    - **Diets high in sugar encourage lactic acid bacteria** to ferment and produce lactic acid
      - *Sucrose is common in developed countries* and so 80-90% of people are colonised by *S. mutans*
      - **Fluoride makes the tooth more resistant to decay**

- **GI tract**
  - This includes:
    - **Stomach**
      - Such as *Lactobacilli*
    - **Small intestine**
      - Such as *Enterococci & Lactobacilli*
    - **Large intestine**
      - Such as *Bifidobacterium & Clostridia*
  - The microflora here are **responsible for the digestion of food, absorption and production of nutrients**
  - The GI tract contains ~$10^{13}$-$10^{14}$ microbes
  - Intestinal microorganisms carry out a number of essential functions:
    - **Vitamin synthesis**
    - **Gas and odour production**
    - **Production of bioactive steroids**
    - **Production of enzymes, such as β-glucuronidase**
  - The type and amount produced of certain substances is influenced by diet and the intestinal flora

- **Respiratory tract**
  - This includes:
    - **Nasal cavity**
      - Such as *Staphylococcus aureus*
    - **Pharynx**
      - Such as *Corynebacterium diptheriae*
    - **Trachea**
      - Such as the influenza virus
  - The **upper respiratory tract contains microorganisms bathed by secretions of mucous**
    - They **enter from the air, become trapped and then are expelled**
    - Resident organisms include *Staphylococcus & Streptococcus*
  - The lower respiratory tract, including the bronchi and trachea, are essentially sterile
    - **Ciliated epithelial cells expel bacteria and particulate matter**
      - Only matter smaller than 10µm can reach the lungs

- **Urogenital tract**
  - The **bladder is typically sterile in healthy humans**
  - Altered conditions can cause potential pathogens to inhabit the urethra (such as *E. coli*)
  - The **vagina of the adult female is weakly acidic** (pH<5) and **contains a lot of glycogen**
    - *Lactobacillus acidophilus*, a resident organism in the vagina, ferments glycogen producing lactic acid which produces a protective environment
      - **This changes before, during and after puberty as well as after menopause**