Oral Microbial Ecology Cheat Sheet

by Carm (Carmilaa) via cheatography.com/49544/cs/17013/

Oral Ecosystem:

- Specific microbial species demonstrating tropism for specific tissues

- Microbial interaction with each other as well as with the oral environment

Formation of an Ecosystem:

Indigenous Microbiota:	Most numerous, Compatible with host
Supplemental Microbiota:	Potentially pathogenic, Can become invasive
Transient Microbiota:	Don't have mechanisms for persisting in the host

Oral Ecosystems:

Buccal epithelium:	Gram-positive cocci
Lingual epithelium:	Gram-positive filaments
Supragingival tooth surface:	Faculative G+ rods and cocci
Subgingival tooth surface:	Anaerobic G- rods and cocci

Microenvironments:

Supragingival:
-Bathed in saliva
-Faculatively anaerobic
-Increased mechanical disruption (swallowing, abrasion)

Subgingival:

-Bathed in crevicular fluid
-Anaerobic
-Reduced mechanical disruption (anatomy of gingival sulcus)

Environmental Factors:

Oxygen tension:	pO2, partial pressure of oxygen, mmHg
Redox Potential:	Eh, tendency to acquire electrons and thus be reduced, mV

Environmental Factors: (cont)

pH:	controlled by exogenous materials carbohydrate fermentation buffering capacity of plaque and saliva
Temperature:	variations
Availability of Nutrients:	carbohydrates, amino acids (salivary glycoproteins), hemin (plasma)

Host Fluids:

Antagonists	
Synergistic:	Nutrients from saliva and GCF
sIgA:	Interferes with colonisation
Glycoproteins:	Aggregation and removal
Lactoperoxidase:	Inactivation of glycolytic enzymes - death
Lactoferrin:	Binds iron limiting bacterial growth
Lysozyme:	Degrades bacterial peptidoglycan

Host Susceptibility:
- Geographic location
- Ethnicity and culture
- Diet
- Health and social status

Microbial Factors:

Adherence:
- Contact: proximity
- Dose: quantity of bacteria
- Frequency of exposure (eg newborns)
- Absorption: initial reversible association with oral tissues

Retention:
- Ability to accumulate at entry site
- Adaption
- Resist host defenses
- Competition from other species
- Changing environments

Co-Aggregation:

Different species, or different strains of a single species, have distinct sets of coaggregation partners

> Streptococcus spp. and Actinomyces spp., two of initial colonizing general on enamel surfaces

> Fusobacbacteria coaggregate w/ other human oral bacteria

> Veillonella spp., Capnocytophaga spp. bind to streptococci/ actinomyces

Each coaggregation is mediated by one or more complementary sets of adhesin-receptor pairs

Coaggregation:

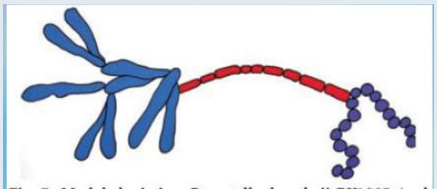

Fig. 7. Model depicting *Prevotella loescheii* PK1295 (red cells) acting as a coaggregation bridge between two non coaggregating cell types, *Actinomyces israelii* ATCC 10048 (blue cells) and *Streptococcus oralis* 34 (purple cells).

CoAggregation Competition:
- Competition occurs when multiple cell types recognize the same coggregation indicator mediator on the common coaggregation partner

Ecological Succession:

Process by whereby a**microbial population undergoes a continuous series of changes in composition as different species colonise and become established at the expense of others.**

As conditions change, the**dominant m/o's will either adapt and be retained or will be superseded by a new species better equipped to survive the altered environment.**

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