The oral microbiome: stability, variation and benefits.

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The microbial populations that inhabit the human mouth are amongst the most well characterised of the human microbiome. The non-invasive nature and accessibility of sampling and the ability to correlate the microbial composition at discrete sites in the mouth with the corresponding healthy/pathological features of the sample sites has led to a considerable level of understanding of the nature of the oral microbiome in health and its relationship to the development of disease. Relatively fewer investigations have addressed the role that these microbial populations may play in the maintenance of oral health and indeed the contributions that oral bacterial populations may make to systemic health. However, there is evidence to suggest that significant benefits to the host are derived from these specialised bacterial communities that have evolved specifically to colonise the oral cavity. These include protection from colonisation by potentially harmful organisms and potentially very significant effects on cardiovascular health through the entero-salivary nitrate circuit wherein dietary nitrate is converted ultimately into the vasodilator, nitric oxide. This presentation will focus upon the use of mouse model systems to study the remarkable stability of the oral microbiome in health and the factors that may contribute to this resilience, the between individual variations in the oral microbiome and how these are intimately linked to the genetic background of the host and finally characterisation of the bacterial communities which may play a broader role in the general health of an individual.