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Bacterial communication and cooperation

Multispecies microbial consortia are a major form of life that includes examples of medical significance such as the gut flora, opportunistic pathogens living in hospital environments, bacterial-fungal consortia present in dental cavities etc. The stability of such consortia is poorly understood and is generally discussed in terms of species-specific mechanisms. On the other hand, there is a growing body of evidence that there are general stability criteria for polymicrobial consortia. Experimental and theoretical studies indicate that some species are capable of stable, long-term collaboration while non-cooperating cheat mutants can cause a local collapse of the community. These simple mechanisms provide a protection against unwanted mutations and environmental challenges so they may serve as guidelines for developing defense strategies against mixed microbial infections.