

Bacteria are noted for the metabolic diversity and the degree to which they exploit many niches. This is done by fast evolution of their metabolic capabilities. The genomes of many closely related bacteria are now available. This offers the possibility of tracing metabolic evolution on a phylogeny relating the genomes. Using simple (independent loss/gain or reactions) or complex (incorporating dependencies among reactions) stochastic models of metabolic evolution, it is possible to test if there are coordination between the evolution of different reactions. We will only use simple models in this investigation. The basic models were developed to detect coordinated evolution between a pair of traits for instance a morphological trait and a nucleotide position in a series of recent papers (Huelsenbeck et al.,2003; Nielsen,2002). These models can be adapted to the set of traits found consisting of all possible reactions and possible metabolic capabilities of a bacteria.