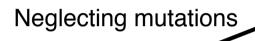
$$\hat{x}_i = \sum_{j=1}^n x_j f_i(\mathbf{x}) q_{ji} - x_i \bar{f}$$

## Replicator-Mutator equation



$$\left| \dot{x}_i = x_i f_i(\mathbf{x}) - x_i \bar{f} \right|$$

Replicator equation

Neglecting frequency dependent fitness

$$\dot{x}_i = \sum_{j=1} x_j f_i \underline{q_{ji}} - x_i \overline{f}$$

Quasispecies equation

 $\dot{x}$  Frequency of type i  $q_{ji}$  Mutation probability from j to i  $\overline{f}$  Average fitness of the population

 $f_i$  Frequency independent fitness of type is  $f(\mathbf{x})$  Frequency dependent fitness of type is