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Replicator Equation and the Principal of Minimum Discrimination Information.

Many systems in mathematical biology and other scientific areas can be described by the so-called replicator equation. We have found a method of solving of a wide class of replicator equations. We showed that i) the solution belongs to the class of exponential distributions; ii) the solution minimizes at every time moment the KL – divergence of the initial and current distributions at time-dependent constrains; iii) the constrains can be computed explicitly at every instant due to the system dynamics. Hence, the MaxEnt principle as well as the Kullback Principle of minimum discrimination information for systems governed by the replicator equations can be not postulated but derived from the system dynamics. (Received September 21, 2007)