1056-92-1153 **Georgiy P. Karev*** (karev@ncbi.nlm.nih.gov), 3014 Homewood Pkwy, Kensington, MD 20895.
Replicator equations and the principle of minimal production of information: some applications to biological models.

Replicator equations (RE) are among the basic tools in mathematical theory of selection and evolution. A general approach to a wide class of RE is developed. The theory gives methods for reducing original complex models to the "escort systems" of ODEs (in many cases, of a small dimension) that can be explored analytically or solved numerically. It allows us to compute explicitly the evolution of distributions, which solve the RE, and all statistical characteristics of interest of the system. The solutions of the considered class of replicator equations minimize the KL–divergence of the initial and current distributions at every instant, i.e., the production of information under time-dependent constraints, which, in their turn, can be computed explicitly due to the system dynamics. The results have potential for different applications. Applications to inhomogeneous models of global demography, the ecological model of tree stand self-thinning, inhomogeneous logistical equations and evolutionary game theory are given. References. G. Karev, On mathematical theory of selection: continuous time population dynamics. JMB, Volume 60, Issue 1 (2010), p. 107 . G. Karev, Replicator equations and the principle of minimal production of information, Bulletin of Math. Biol. (submitted) (Received September 21, 2009)