

Branching Stochastic Processes and Cell Proliferation Kinetics
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The theory of branching processes has a long history of biological applications. It is worth to point out that the first asymptotic result for branching processes was obtained by Kolmogorov (1938) considering some biological problems. Recall that the terminology "branching processes" was first introduced by Kolmogorov (1947) proposing multitype branching processes, which received much attention in biological applications. This is a memorial survey paper on some joint works with A. Yu. Yakovlevy: The main purpose of this work is to present some new ideas and results in the theory of branching processes obtained in modeling of cell proliferation kinetics. The following topics are considered: some characteristics of cell cycle temporal organization, distributions of discrete and continuous labels, age and residual lifetime distributions, models of leukemia cell kinetics, age-dependent branching populations with randomly chosen paths of evolution as models of progenitor cell populations (in vitro) and estimating of offspring distributions, multitype branching processes with a large number of ancestors and asymptotic likelihood estimation of the basic mitotic parameters. A part of the presented results is not published yet.