Age-dependent Branching Processes with Non-homogeneous Poisson Immigration as Models in Cell Proliferation Kinetics

Ollivier Hyrien, Nikolay M. Yanev,
Ollivier_Hyrien@URMC.Rochester.edu; yanev@math.bas.bg

Department of Biostatistics and Computational Biology, University of Rochester, Rochester, NY, USA.
Department of Probability and Statistics, Institute of Mathematics and Informatics, Bulgarian Academy of Sciences, Sofia, Bulgaria

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Abstract

The dynamics of populations of progenitor cells and their differentiated progeny is studied using age-dependent branching processes with immigration. Properties of a class of two-type reducible processes with an immigration process formulated as a non-homogeneous Poisson process are investigated. In particular, the asymptotic behavior of expectations of the process is established and a parameter for criticality is identified. To obtain these results, asymptotic properties for solutions to renewal-type equations, which offer extensions to existing renewal theory, are established.

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References

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