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**Branching processes - Regulation, Regeneration,  
Statistical Inference, Applications**

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This is a review on branching processes (BP) which are often applied as models describing the population dynamics where some objects (particles, cells, individuals) can reproduce new objects following some stochastic laws. Notice that classical BP with independent individual evolutions are extensively investigated in the literature and well described in several monographs. But in many real situations, the evolutions of the individuals are not independent. BP with random control functions [1] can be considered as an approach to modeling dependent evolutions. A class of BP with non-homogeneous in time regulation [2] represents another possibilities. We developed also general methods for renewal and regenerative processes which are successfully applied in the theory of BP [3]. Recently we consider also a new class of multitype BP with non-homogeneous immigration [5]. For all these classes limit theorems are obtained depending of various models of regulation or regeneration. Statistical estimation for some classes of BP is also developed especially for the processes with a large number of ancestors [4]. Some models of BP in cell proliferation dynamics are considered in [6].

**References**

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