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An age-structured model with dynamic death rate

We consider a general age-structured model for the regulation of red blood cells in which the lifespan of the circulating cells is determined by a general survival function. Using techniques borrowed from demography, an associated death rate is introduced into the modeling equations, and standard methods for the integration of the latter yield a coupled system of differential and integral equations. The stability of the equilibria of this system is analyzed, and Hopf bifurcations are detected. We pay particular attention to the relationship between these stability properties, the survival function specifics and the distribution of lifespans of the erythrocytes.

This is joint work with Frédéric Paquin-Lefebvre.