08
OCT.
2015

🕐 de 11h à 12h

Dynamics of slow cell renewal in humans

Samuel Bernard
Institut Camille Jordan

Human tissues constantly replace dying cells with newborn cells. The pace at which they are replaced, however, varies by orders of magnitudes between blood cells, which are renewed every day and neurons, for which renewal is non-existent or limited to specific regions of the brain. Between those extreme are many tissues that turnover on a time scale of years, although no direct measurements have been done. We present here a mathematical method to estimate cell turnover in slowly renewing biological systems. Age distribution of DNA can be estimated from the integration of radiocarbon derived from nuclear bomb-testing during the cold war (1955-1963). For slowly renewing tissues, this method provides a better estimate of the average age of the tissue than direct estimates from the bomb-curve. Moreover, death, birth and turnover rates can be estimated. We highlight this method with data from hippocampal neurons and cardiomyocytes.