

Cologne Evolution Colloquium

Melike Donertas
EMBL-EBI, Hinxton UK

Temporal changes in gene expression across individuals, organs, and cells

Unlike development, ageing is not thought of as a programmed process but a result of cellular and evolutionary stochastic events. Thus, comparative analysis of development and ageing periods can help understand the underlying mechanisms and characteristics of ageing. This seminar will summarise our recent work, comparing gene expression changes during postnatal development and ageing across individuals, organs, and cells. Using transcriptome datasets covering the whole lifespan, we study how the level and between-individual variability of gene expression change with age. We first show that, in the human brain, increased heterogeneity is characteristic for ageing but not for development. Moreover, the temporal trend in gene expression during development does not necessarily continue to the ageing period, at which half of the expression trajectories are reversed. Studying this phenomenon in multiple tissues of mice, we found that these reversals are associated with tissue-specific functions and contribute to an interesting phenomenon that tissues diverge from each other during postnatal development but, during ageing, tend to converge towards similar expression levels. Lastly, using an external single-cell gene expression dataset, we study how tissue composition and cell-autonomous changes may contribute to this divergence-convergence pattern. Overall, our results highlight the loss of tissue- and potentially, cellular-identity as a common aspect of ageing.

Wednesday, March 17, 2021, 17:15

Institute for Biological Physics & MPI for Biology of Ageing

Online via Zoom

Hosted by Dario Valenzano