

Microglial Dynamics Across The Human Lifespan

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Content

Microglial cells appear in the brain rudiment at about 4 postconceptional weeks (pcw) (Carnegie stage (CS) 10) and are thought to derive from yolk-sac progenitors similarly to the rodent. By 22 pcw, colonisation of the brain is speculated to be complete. In the adult, these cells turnover at a slow rate (reported between 0.08% and 2% at any one time). Microglial spatiotemporal dynamics have not been carefully examined in the human developing brain particularly in the context of co-occurring developmental processes. It is also unclear when their regional heterogeneity is first established nor how their developmental dynamics contribute to the adult pool. We also do not have a baseline characterisation of microglial cells in old age in the absence of overt pathology. With the appropriate ethical approval, we have obtained frontal and temporal tissues from 10 participating centres in the UK and Europe to study microglial cell dynamics across the human lifespan. 145 individuals aged between the 4th pcw and 90 years are being studied. Transcriptomic data available from the early and mid-fetal periods made it possible to examine the spatiotemporal establishment of the transcriptional signature of microglia in the human. In this presentation we will report on the preliminary findings of our study and how these inform our understanding of microglial function in the developing human brain.

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