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Developmental circuits in ageing

A theme issue compiled and edited by Eric Gilson, Emma Teeling and George Garinis

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About this issue

When do we start to age? This theme issue shows that the answer is during development. Molecular aging starts in the early embryo, and the way an organism grows, matures and reproduces sets a longevity programme adapted to its environment and physiology. Animals that keep renewing their bodies, such as hydra or planarians, barely age. Mammals and birds build long-lasting organs and age more visibly. Telomeres, the protective ends of chromosomes, shorten from early life in some species but not others, recording early conditions such as climate or parental care. Ageing can start in one organ and spread to others. This opens windows for anti-aging intervention: early in life, or later, by blocking that spread.

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Front image: A horseshoe bat adult and juvenile framed by a metaphase spread, with telomeres magnified, illustrating how the ageing mechanisms are intertwined with development. Image credits: Adult horseshoe bat: Hetty Metcalfe; Juvenile horseshoe bat: Daniel Whitby; Metaphase: Delphine Benarroch-Popivker. Image created by Megan Power, Eric Gilson and Emma Teeling using Adobe Illustrator and Photoshop.

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