

REJUVENATION BY CELL REPROGRAMMING

ALCHEMISTS' ELIXIR OF ETERNAL YOUTH

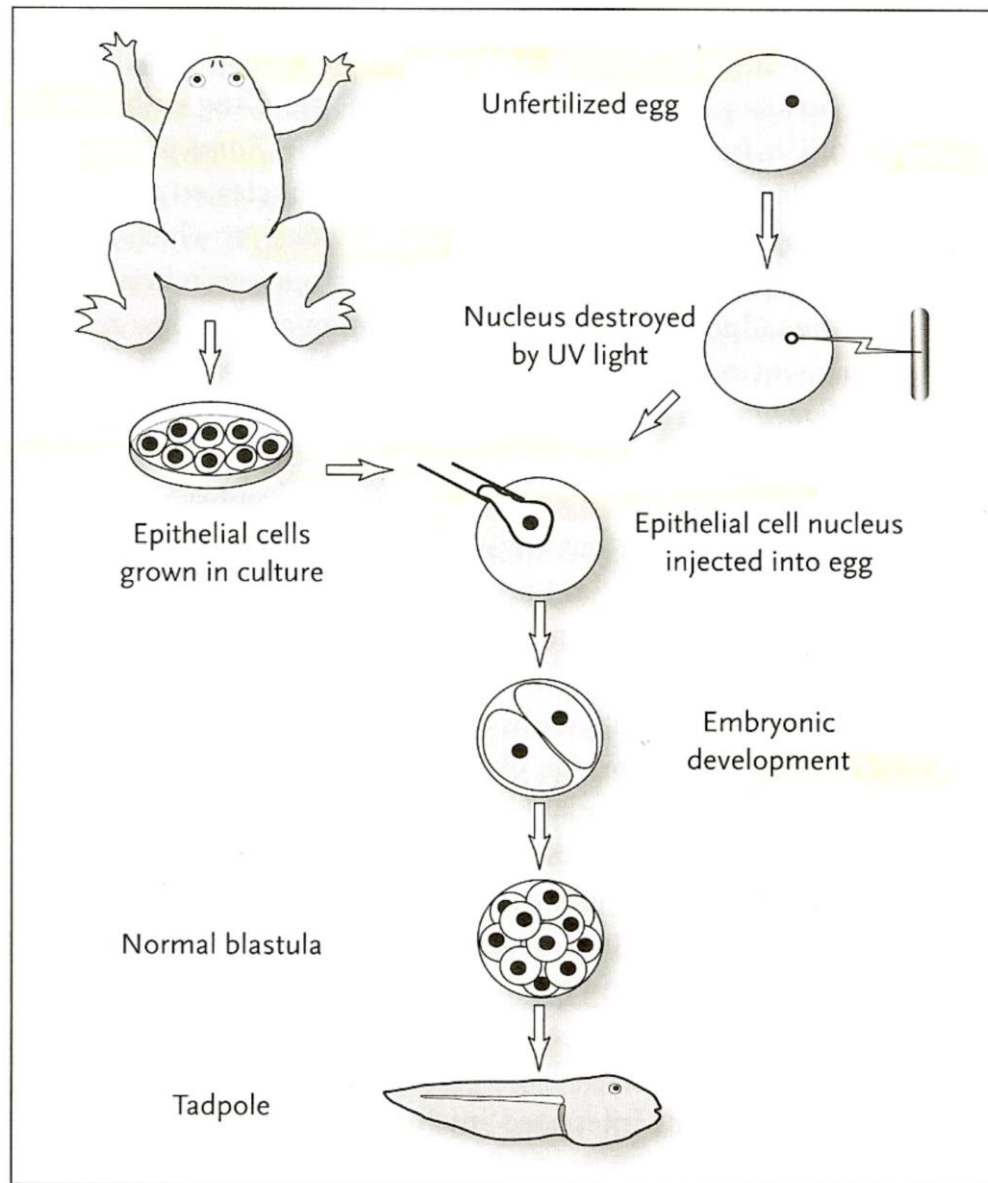


OOCYTE CYTOPLASM: THE BIOLOGICAL FOUNTAIN OF YOUTH



FROG CLONING

John Gurdon, 1962
First animal cloning
using differentiated
cells for nuclear transfer



Cloning a frog by nuclear transfer. Epithelial cells are collected from an adult and grown in culture. An unfertilized egg cell is collected and exposed to UV radiation to destroy its nucleus. A nucleus, with some cytoplasm surrounding it, is extracted from a cultured epithelial cell and injected into the enucleated egg. If successful, the clone will develop into a normal blastula and finally a tadpole.

MATURE OOCYTE CYTOPLASM:

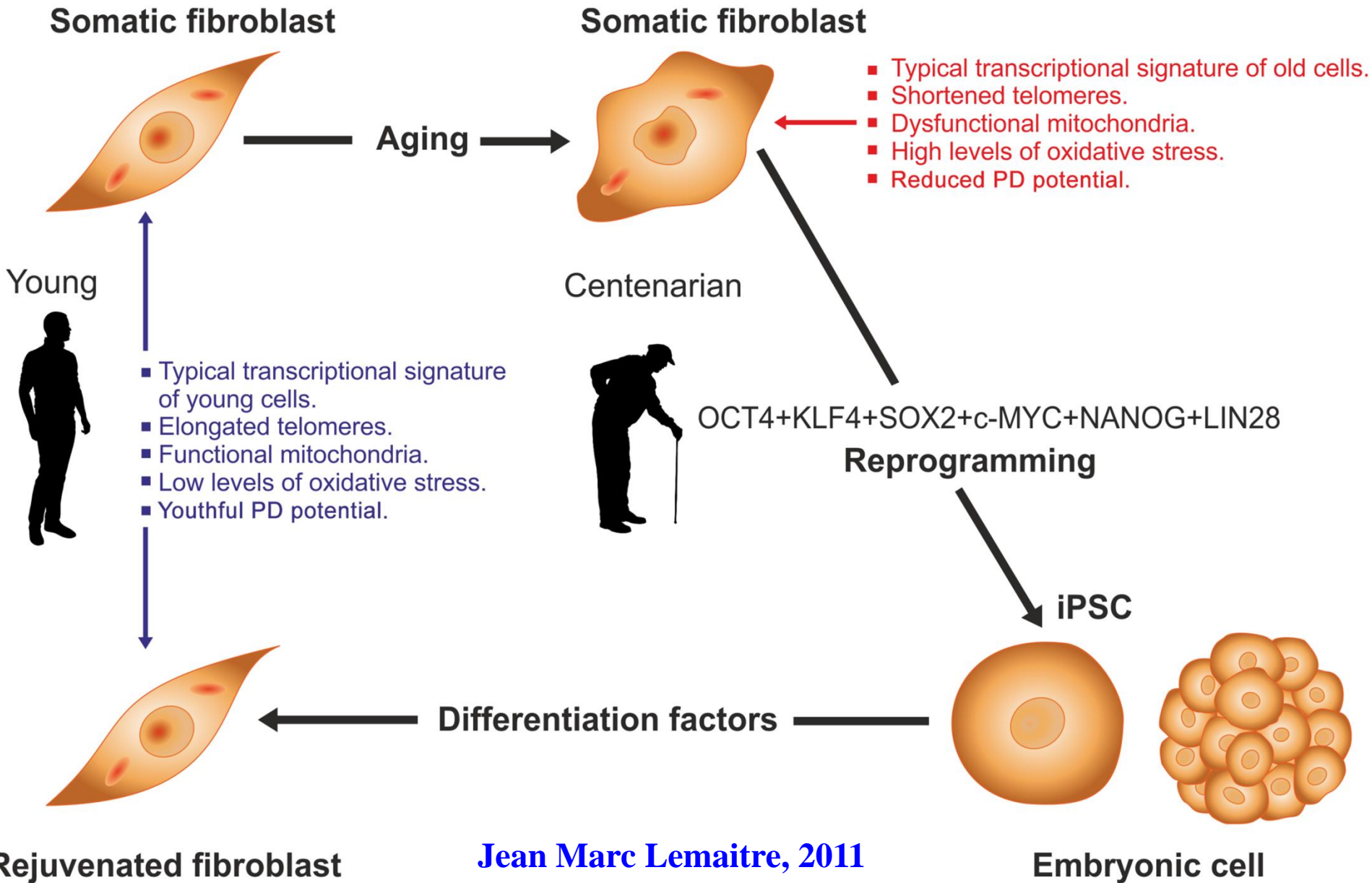


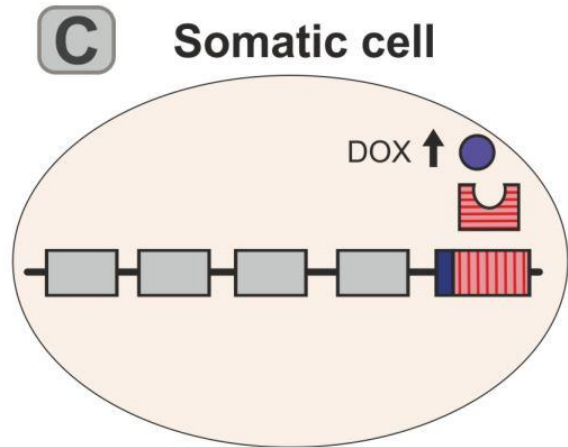
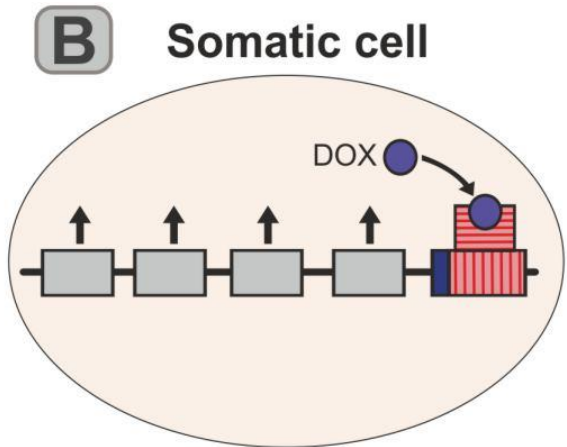
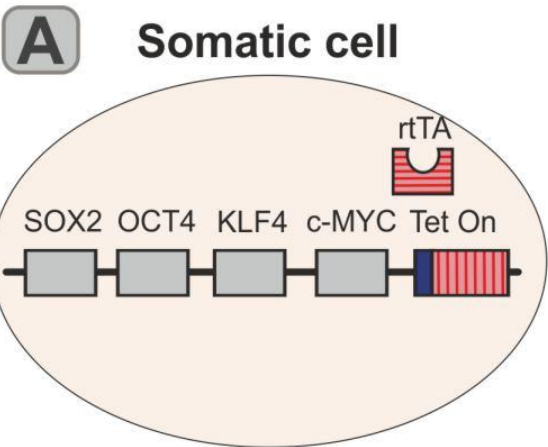
CELL REPROGRAMMING



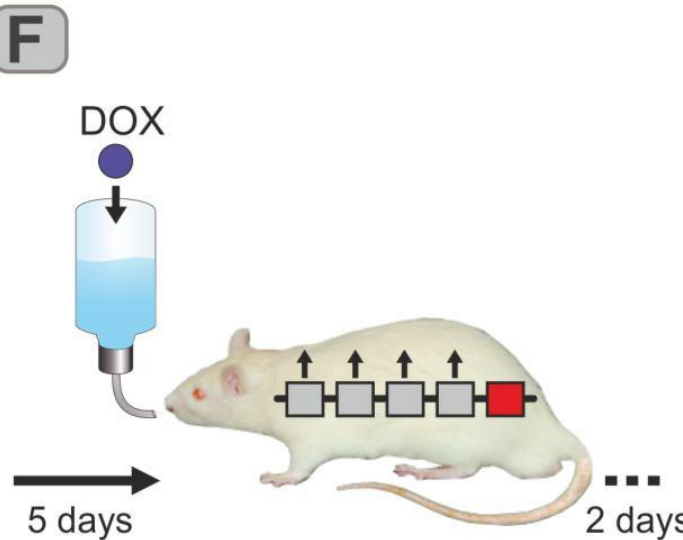
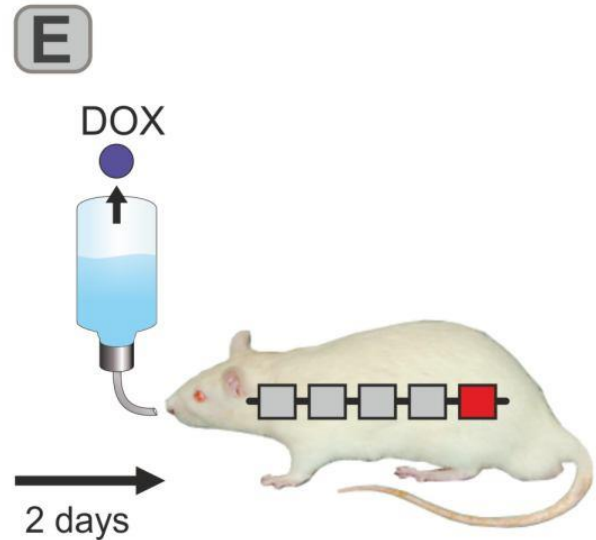
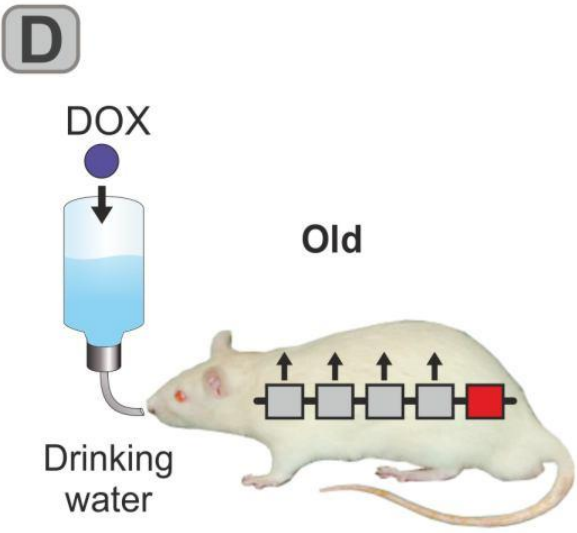
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REJUVENATION OF HUMAN FIBROBLASTS

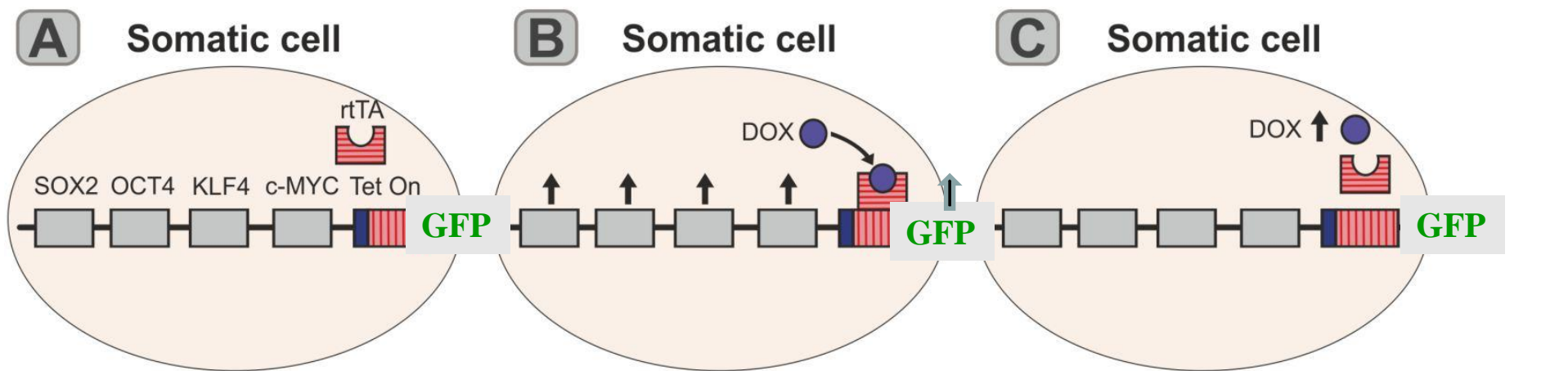




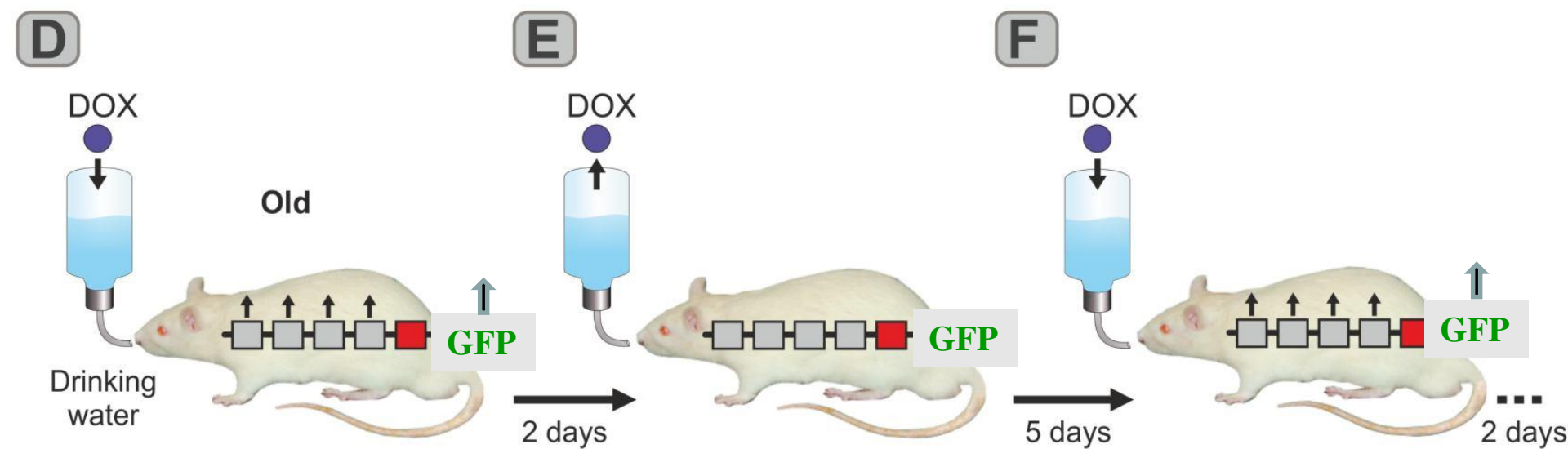
Progressively rejuvenated



Stomach, spleen, kidney, skin

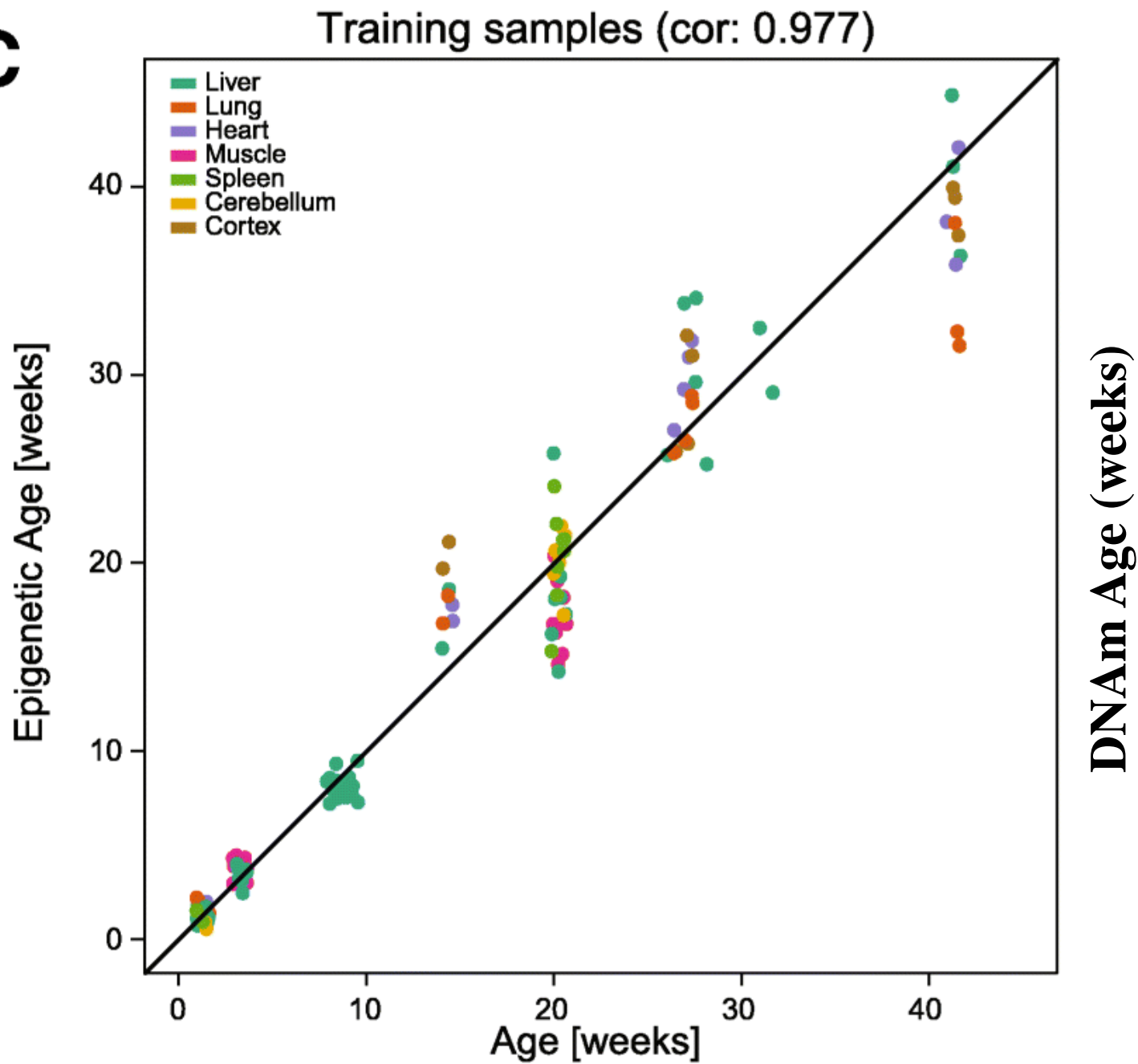


Progressively rejuvenated



Brain and female reproductive system

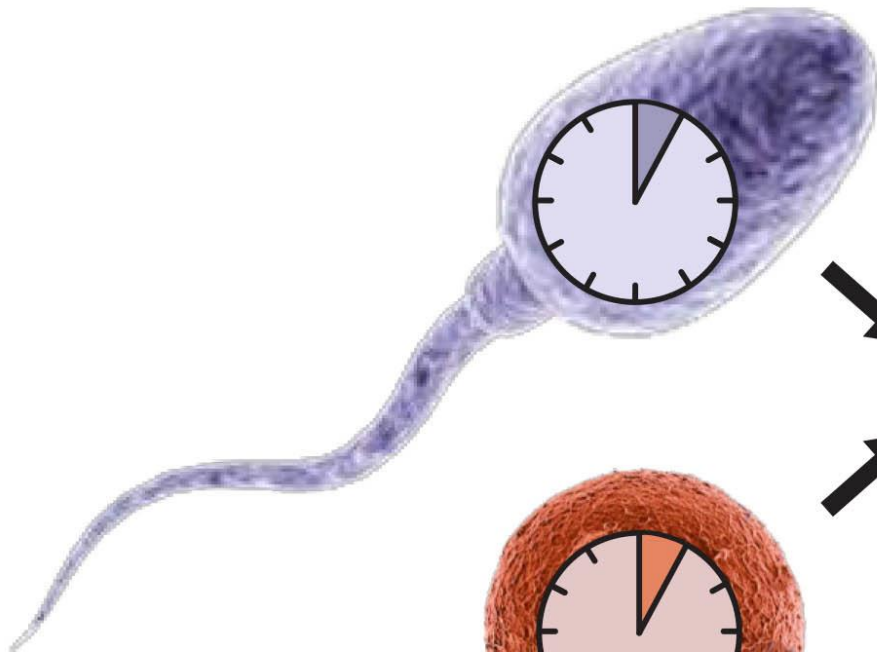
The Epigenetic Clock

C

IMPLICATIONS OF THE EPIGENETIC MODEL

RESETTING THE AGING CLOCK DURING FERTILIZATION

Sperm cell



Oocyte



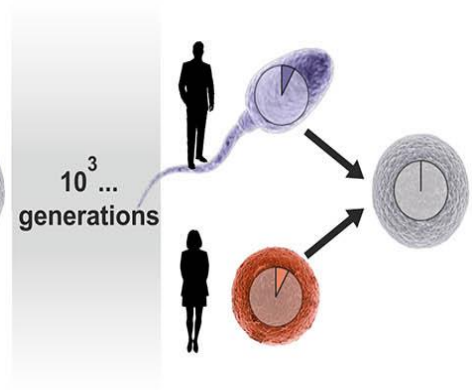
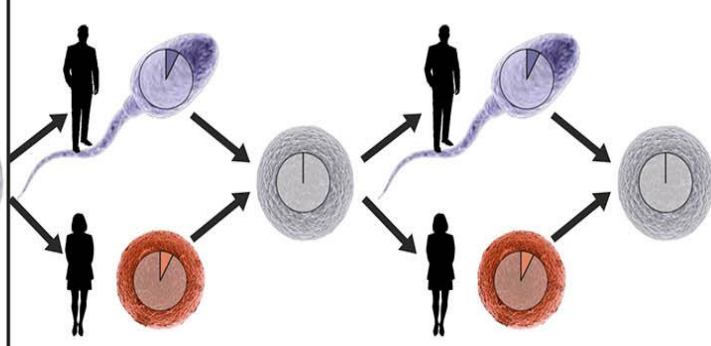
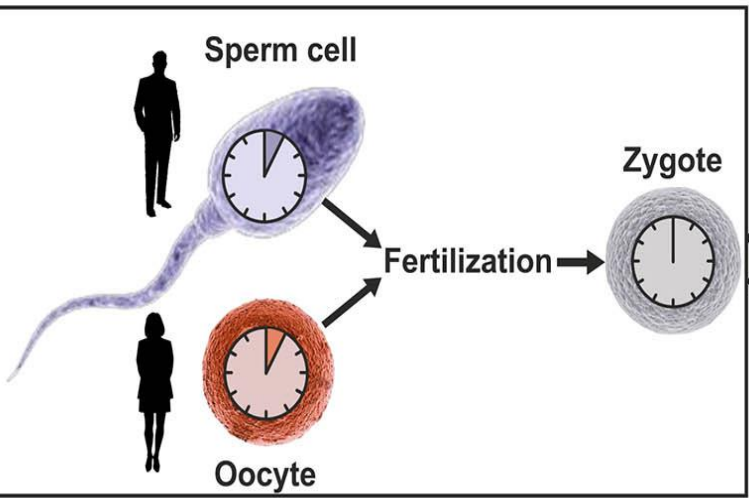
Fertilization



Zygote



EPIGENETIC MODEL



**Any sufficiently advanced
technology
is indistinguishable from magic.**

Arthur C. Clarke

**The magic of human technology
is making rejuvenation possible.**

THE END