Conrad Hal Waddington

Wikipedia writes:

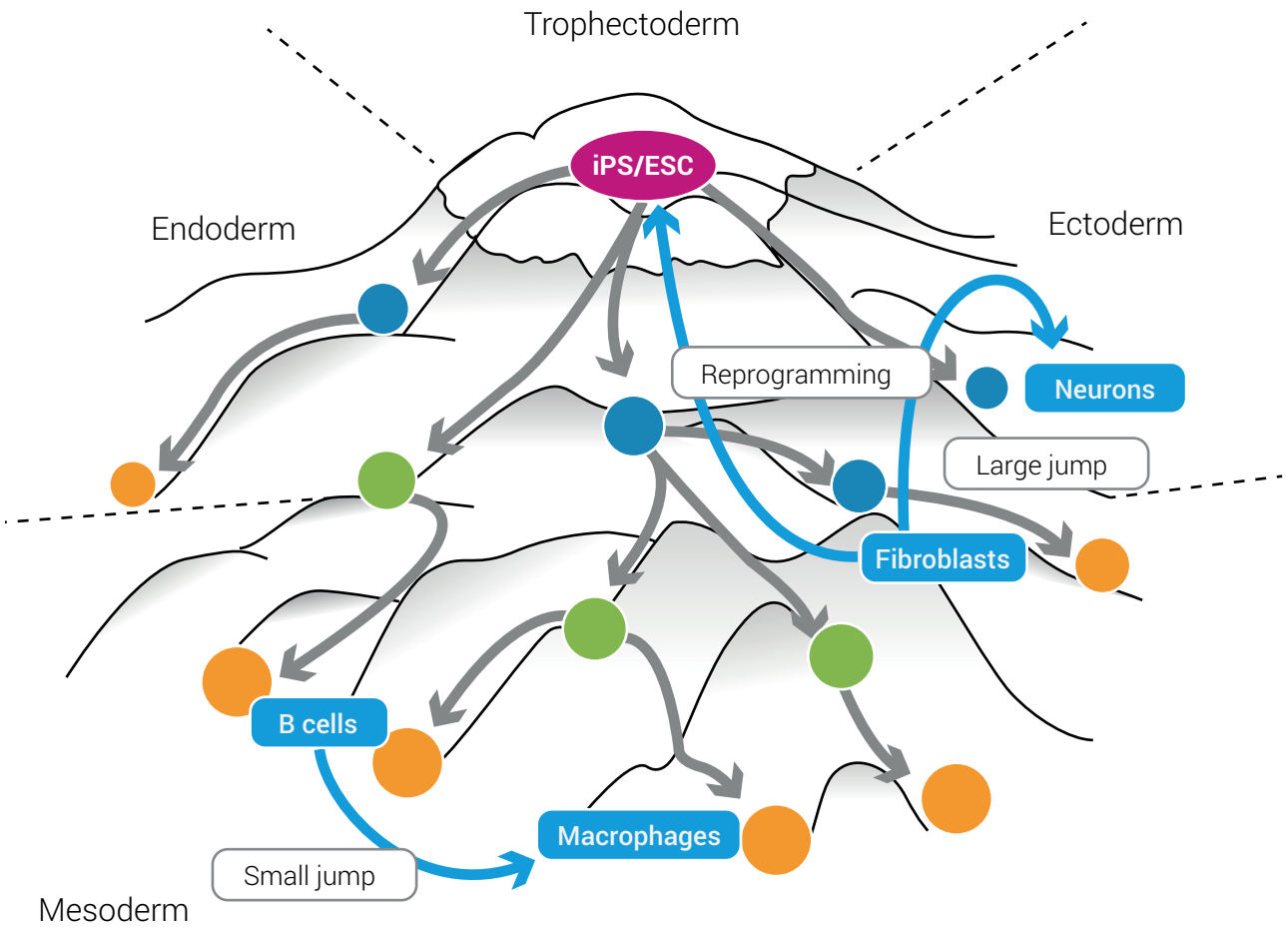
"...British developmental biologist, paleontologist, geneticist, embryologist and philosopher. He carried out basic work on developmental biology and epigenetics. Waddington is regarded as an important forerunner of today's evolutionary developmental biology (EvoDevo)" (evolution and development).

Search terms
Epigenetic landscape, channeling, buffering and genetic assimilation, EvoDevo research

born Nov. 8..1905	Eversham, England
1926	Graduated in geology at Sidney Sussex College Cambridge
From 1926	Studied philosophy, modern art and Morris dancing; studied Hans Spemann's research on amphibious embryos
1930	Specialized in embryology
1935	Cambridge ScD (Doctor of Science)
1936	Fellow of Christ's College Cambridge
1936	Albert Brachet Prize in embryology
1947	Professor and head of the Institute for Animal Genetics at the University of Edinburgh
1957	Published the essay on *The Strategy of the Genes*
† 26.09.1975	Edinburgh, Scotland

Epigenetic landscape

Waddington's original definition of epigenesis referred to changes during cell differentiation and the way in which the ability of cells to transform becomes limited with time. He was particularly interested in the stabilization of stages during the development process. To illustrate these processes, he used the metaphor of the epigenetic landscape and presented it in a model: The cell – represented by a ball – rolls through valleys of a hilly landscape and strives to reach the point of minimal energy expenditure. Waddington described how these developmental paths are influenced by genes but are also characterized by environmental factors. Because of the valley walls between the individual paths, the course cannot be easily changed. However, induction from outside can be strong enough to overcome a valley flank in the epigenetic landscape (large jump). The ball then enters an adjacent valley, development is channeled differently. The concept remains valid until today, even though epigenetics has changed its definition and today refers to various regulatory options that can influence the activity of genes independently of the DNA sequence.



Emmanuelle Charpentier

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Search terms
CRISPR/Cas9, Genome Editing, Jennifer Doudna

born 11.12.1968	Juvisy-sur-Orge, France
1986-1992	Studied biology, microbiology, biochemistry and genetics at University Pierre et Marie Curie, Paris (UPMC)
1992-1997	Doctoral student at Pasteur Institute, post-doctoral student at Pasteur Institute and Rockefeller University, New York
1997-1999	Assistant Research Scientist at New York University Medical Center
1999-2002	Research Associate at St. Jude Children's Research Hospital, Memphis and at the Skirball Institute of Biomolecular Medicine, New York
2002-2004	Research Group Leader and visiting professor at the Institute of Microbiology and Genetics, University of Vienna
2004-2006	Research Group Leader and Assistant Professor, University of Vienna
2006	Senior Lecturer for microbiology and habilitation at the Centre for Molecular Biology, University of Vienna
2006-2009	Research Group Leader and Associate Professor at Max F. Perutz Laboratories, Vienna
2009-2014	Research Group Leader and Associate Professor at the Laboratory for Molecular Infection Medicine Sweden (MIMS), University of Umeå, Sweden
2013	Lecturer in Medical Microbiology, University of Umeå
2013-2015	Head of Department at the Helmholtz Center for Infection Research, Braunschweig and W3 professor at Hannover Medical School
since 2015	Director at the Max Planck Institute for Infection Biology, Berlin

The article *A Programmable Dual-RNA-Guided DNA Endonuclease in Adaptive Bacterial Immunity* was published in 2012. On five pages, the authors Emmanuelle Charpentier and Jennifer Doudna describe the defense system of the scarlet fever bacterium Streptococcus pyogenes: it uses a molecule-sized instrument that consists of a viewfinder and a kind of DNA scissor. The acronym for this defense system is CRISPR/Cas9, generally abbreviated to: CRISPR [pronounced: kris :: per]. The gene scissors of the streptococcal bacterium can be reconstructed, and its viewfinder set on any targets of the DNA sequence.