

In the news

A NOBEL ENDEAVOUR

The 2012 Nobel Prize in Physiology or Medicine has been awarded to John Gurdon and Shinya Yamanaka “for the discovery that mature cells can be reprogrammed to become pluripotent.”

Gurdon's work dates back to the 1960s, when it was generally accepted that cell differentiation cannot be reversed. However, Gurdon found that this was not the case; when he replaced the nucleus of an unfertilized frog egg with that from a differentiated intestinal cell, he saw that the egg could still give rise to tadpoles — a technique now known as nuclear transfer.

Forty years later, Yamanaka also managed to successfully turn back the developmental clock, by treating differentiated cells with four transcription factors. These cells had some features of embryonic stem cells and were later termed induced pluripotent stem (iPS) cells.

Their work has changed the way we think about development, by providing us with insights into how cells become specialized and the reversible nature of differentiation. “[They] demonstrated conclusively that it is possible to turn back the clock on adult cells,” commented Mark Walport, Wellcome Trust, (bbc.co.uk, 8 Oct 2012). “[This work] really lays the groundwork for all the excitement about stem cell biology,” said Doug Melton, Harvard Stem Cell Institute, USA, (Washington Post, 8 Oct 2012).

The work also offers therapeutic prospects, as reprogrammed cells could be used to study disease, screen drugs or regenerate whole tissues. As commented by Yamanaka: “We can create the stem cells from patients and from healthy volunteers. That is a very important advantage.” (San Francisco Chronicle, 8 Oct 2012.) Gurdon emphasized that this is “why it is so important to support basic science — it often happens that therapeutic benefit comes quite a long time after the initial discovery.” (Nature News, 8 Oct 2012.)

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