Finding stem cells' birthplace raises hope for leukaemia cure

Researchers now have an answer to one of the biggest biological mysteries of recent times. How and where do stem cells that differentiate later into blood cells originate and draw sustenance from? The finding provides hope to many leukaemia patients.

'It was a big mystery, where these cells originated,' said Hanna Mikkola of the University of California at Los Angeles (UCLA), who co-authored the study that has come up with the answer.

'This is the first time we can say definitively that blood stem cells are generated in the placenta. There's no more speculation.'

The discovery may permit scientists to mimic the specific embryonic environment necessary for the development of blood stem cells.

They could then grow them for treating complications like leukaemia and aplastic anaemia, said Mikkola.

'If we want to fully harness the potential of embryonic stem cells to treat disease, it's critical for us to learn how to make tissue specific stem cells,' said Mikkola. 'We can learn that by studying what happens during embryonic development.'

Researchers in Mikkola's lab are working now to replicate in humans this work done in mouse models.

The findings of the study appear in the latest issue of the journal Cell Stem Cell.

Scientists can now take embryonic stem cells, the cells that can become any tissue type in the body, and coax them into becoming all the red and white blood cells and platelets.

However, researchers can't make blood stem cells that self-renew, or replicate themselves, and don't differentiate prematurely when transplanted into patients.

To generate blood stem cells safe for use, it is imperative that scientists learn how to generate self-renewing stem cells in a more natural way, by providing the correct developmental cues from the environment in which the cells develop.

Currently, patients with certain types of leukaemia have one shot at a cure - a bone marrow transplant. However, there aren't nearly enough bone marrow donors to provide patients with perfect matches.

If researchers could grow blood stem cells, those cells could be transplanted into these patients. The blood stem cells would then differentiate into a new, and healthy, blood supply.

Mikkola is confident the study can be confirmed in humans.

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