

Early-stage sperm cells created from human bone marrow

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Human bone marrow has been used to create early-stage sperm cells for the first time, a scientific step forward that will help researchers understand more about how sperm cells are created.

The research published today (Friday, April 13 2007), in the academic journal *Reproduction: Gamete Biology*, was carried out in Germany by a team of scientists led by Professor Karim Nayernia, formerly of the University of Göttingen but now of the North-east England Stem Cell Institute (NESCI), based at the Centre for Life in Newcastle upon Tyne.

For the experiment, Prof Nayernia and his team took bone marrow from male volunteers and isolated the mesenchymal stem cells. These cells have previously been found to grow into other body tissues such as muscle.

They cultured these cells in the laboratory and coaxed them into becoming male reproductive cells, which are scientifically known as 'germ cells'. Genetic markers showed the presence of partly-developed sperm cells called spermatagonial stem cells, which are an early phase of the male germ cell development. In most men, spermatagonial cells eventually develop into mature, functional sperm but this progression was not achieved in this experiment.

Earlier research led by Prof Nayernia using mice, published in *Laboratory Investigations*, also created spermatagonial cells from mouse bone marrow. The cells were transplanted into mouse testes and were

observed to undergo early meiosis - cell division - the next stage to them becoming mature sperm cells, although they did not develop further.

Talking about his newly published research paper, Prof Nayernia, of Newcastle University, said : "We're very excited about this discovery, particularly as our earlier work in mice suggests that we could develop this work even further.

"Our next goal is to see if we can get the spermatogonial stem cells to progress to mature sperm in the laboratory and this should take around three to five years of experiments. I'll be collaborating with other NESCI scientists to take this work forward.

Prof Nayernia says a lengthy process of scientific investigation is required within a reasonable ethical and social framework to be able to take this work to its next stage or to say if it has potential applications in terms of fertility treatments in humans.

Prof Nayernia gained worldwide acclaim in July 2006 when he announced in the journal *Developmental Cell* that he and colleagues had created sperm cells from mouse embryonic stem cells and used these to fertilise mice eggs, resulting in seven live births.

Source: University of Newcastle upon Tyne

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