Main Highlights

News Article Name	Highlights
◆ **Drug could help fight leukaemia**	A drug that triggers the production of stem cells could help rebuild the blood of leukaemia patients, according to researchers
◆ **Stem cell gel helps repair traumatic brain injuries**	A scientist has developed a gel that stimulates the growth of stem cells to helps damaged brains recover from traumatic injuries

1. Drug could help fight leukaemia

3rd Sept, 2009

A drug that triggers the production of stem cells could help rebuild the blood of leukaemia patients, according to researchers.

The compound, called prostaglandin E2 (PGE2), re-supplies the bone marrow with fast-acting stem cells that develop into white and red blood cells.

Scientists hope it will provide a lifeline for patients who have been deprived of blood cells, resulting in anaemia and recurrent infections due to poor immunity.

In leukaemia patients, radiation and chemotherapy used to kill the cancer wipes out blood cell production in the bone marrow.

Other patients with infections or genetic blood disorders can also suffer from too few or abnormal bone marrow cells.

Stem cell transplants from healthy donors can restore the marrow's ability to supply blood cells. But while they are recovering, typically over a period of around six weeks, patients may still be at risk from having too few white and red cells.

They are also prone to internal bleeding due to a lack of platelets, which are also made in the marrow.

The new research, reported in the journal Blood, was conducted on mice and showed that prostaglandin E2 (PGE2) has the potential to speed up bone marrow recovery dramatically by increasing numbers of fast-acting stem cells.

Study leader Dr Laura Calvi, from the University of Rochester Medical Center in the US, said: "Our results show that PGE2 more quickly restores blood cell production, and continues to do so for the exact period, six to eight weeks, when patients are most at risk.

"Currently stem cell treatments used for the restoration of bone marrow function are often unable to produce enough stem cells, or throw off the balance between stem cells and mature blood cells. PGE2 treatment could represent a precise way to accelerate recovery from bone marrow injury."

2. Stem cell gel helps repair traumatic brain injuries
4TH Sept, 2009

A scientist has developed a gel that stimulates the growth of stem cells to helps damaged brains recover from traumatic injuries.

Clemson University bioengineering professor Ning Zhang developed thebiomaterial hydrogel, which is injected at the site of injury. The gel has the potential to spur the growth of a patient's own neural stem cells, helping to structurally repair the brain injury site.

"We have seen an increase in brain injuries due to combat, but our strategy can also potentially be applied to head injuries caused by car accidents, falls and gunshot wounds," Zhang said in a statement. "These results that we are seeing in adult lab rats are the first of its kind and show a sustained functional recovery in the animal model of TBI (traumatic brain injury). It also represents one of very few in the traumatic brain injury field that attempts structural repair of the lesion cavity using a tissue-engineering approach."

The gel acts as a vehicle for natural and artificial chemicals that can stimulate biological processes at the site of injury. An injury site often has limited blood supply, causing donor cells to fail to grow or stimulate repair; in research done on rats, Zhang was able re-establish full blood supply at the site of brain injury using the gel, opening the gates for donor brain cells to do their work.

Brain injuries are particularly difficult to repair, since swelling must be controlled in so as not to cause damage.

***Popular Science* explains the problem with current treatments:**

So far, treatments have tried to limit this secondary damage by lowering the temperature or relieving the pressure at the site of injury. However, these techniques are often not very effective.

More recently, scientists have considered transplanting donor brain cells into the wound to repair damaged tissue. This method has so far had limited results when treating brain injuries.

Zhang predicts the procedure may be ready for human testing in three years.