

Researchers discover adult cell that acts like stem cell from embryos

Scott Gottlieb *New York*

Researchers have found a previously unknown type of cell in adult bone marrow that acts much like the highly versatile stem cells from human embryos and is capable of turning into a wide assortment of the body's various tissues. The finding raises hopes that the new cells can be fashioned into transplantable material for patients whose own cells and tissues have become faulty.

Previously, scientists had documented other cells of the adult body that give rise to various tissues, but nothing nearly as versatile as these bone marrow cells. The new cells were discovered by Dr Catherine Verfaillie and colleagues at the University of Minnesota, who reported the details last week in the online version of *Nature* (www.nature.com).

Dr Verfaillie has found the versatile cells, called multipotent adult progenitor cells, in the bone marrow of humans and other

species. She found the cells by accident, in the course of trying to culture mesenchymal stem cells, which are normally used by the body to renew bone and cartilage. She noticed that after the mesenchymal stem cells had died off, another cell remained, the multipotent adult progenitor cell.

The first indications of her discovery were released last autumn. But in the report published in *Nature* she used a more definitive test to show that the cells are truly versatile. In this test, multipotent adult progenitor cells from mice were injected into mouse embryos. As the embryos matured, the cells incorporated themselves into almost every organ of the body.

The multipotent adult progenitor cells could in principle do everything expected of embryonic stem cells, with two extra advantages. They do not form a spontaneous tumour

(teratoma), a serious hazard of therapy with embryonic stem cells, and they could in many cases be derived from the patient to be treated, lowering the risk of rejection.

Dr Robert Goldstein, chief scientific officer at the Juvenile Diabetes Research Foundation International, said that Dr Verfaillie had made a "pretty convincing" case for the versatility of the multipotent adult progenitor cells.

Opponents of using embryonic stem cell are likely to cite Dr Verfaillie's findings to support their argument that cell therapy can be based on adult stem cells alone. Dr Verfaillie, along with many other biologists, rejected that argument, saying that at this stage both types of cell should be studied in parallel so that scientists can figure out which type offers the most promise for which disease.

One question that remains is whether versatile multipotent adult progenitor cells exist in the body or if Dr Verfaillie created them unintentionally during the process of isolating and culturing them in laboratory dishes. □

Popping a multivitamin daily can keep disease at bay

Deborah Josefson *Nebraska*

Nearly all adult Americans have dietary deficiencies in one or more vitamins and should be taking multivitamin supplements, a new paper has asserted (*JAMA* 2002;287:3116-29).

Drs Robert Fletcher and Kathleen Fairfield of the Harvard Medical School's departments of public health, ambulatory medicine, and epidemiology, reached these conclusions after reviewing the literature on vitamins, nutritional supplements, toxicities, and disease states. They recommend that all adults take one multivitamin pill daily and that elderly people take two multivitamin pills as they are more susceptible to vitamin deficiencies.

The authors searched the Medline database for articles and randomised trials involving vitamins published from 1966 to January 2002.

Nine vitamins were selected for review: folic acid, vitamins B-6 and B-12, vitamin D, vitamin E, the provitamin A carotenoids, vitamin A, vitamin C, and vitamin K. Additionally, the carotenoid lycopene was included in the review because of evidence that it might help to prevent prostate and breast cancers. Thiamine (vitamin B-1) and riboflavin (B-2) were excluded because of scant evidence of their relation to chronic disease.

Suboptimal vitamin levels are common and contribute to the chronic diseases that plague Western society, the researchers said. The literature search disclosed that people who have alcohol dependence, are elderly, are vegans, or have malabsorptive disorders are especially at risk of vitamin deficiency. In particular, low levels of folic acid and vitamins B-6 and B-12 are risk factors for cardiovascular disease, neural tube defects, and breast and colon cancers.

High homocysteine levels are associated with atherosclerosis, and most US adults would benefit from folic acid supplementation. □

Doped East German athletes to receive compensation

Annette Tuffs *Heidelberg*

Athletes from former East Germany who were given performance enhancing drugs for many years and who consequently experienced longstanding health problems will receive payments of several thousand euros, the German federal parliament decided on 13 June.

A special law has been passed which sets up a compensation fund of about €2m (£1.3m; \$1.9m). The fund is meant to be supplemented by the sports industry and by national sports associations, but neither of these groups has been keen to join the initiative. It is estimated that between 500 and 1000 men and women will apply for compensation by the end of the year and will receive about €3000 each. Currently, the association representing athletes who have had health problems as a result of



Former East German athletes Ute Krause (left) and Birgit Boese enter a Berlin courthouse for the trial of a former East German sports doctor accused of harming 142 sportswomen

doping has about 150 members.

Soon after the fall of the Berlin wall in 1989, it became apparent that many East German athletes had had to pay a high price for the overwhelming success of the nation in many disciplines. Continuous doping from a young age and for a very long time, mainly with anabolic drugs, ruined their health. Doping was often done without the athlete's consent or knowledge. East German trainers and doctors merely followed the

socialist party's instructions.

The list of health problems is long: acne, hirsutism, deep voice, muscle tension, gynaecomasty, breast cancer, bone deformation, vascular disease, and teratogenic malformations. In some cases female athletes changed their sex as a result of the continuous intake of male hormones.

The association representing such athletes, as well as single athletes, is not satisfied with the new law, which will come into force in 2003. □