

THE idea of an elixir of youth is as old as recorded history. Alchemists from ancient Egypt tried to make a powder or a liquid that could cure all diseases and prolong life. These days, you don't have to go much further than a pharmacy, health food shop or department store. And you can get pills, creams, ointments, tonics, infusions – all containing vitamins, herbal extracts, minerals and antioxidants, but promising the same thing as the alchemists of old: health and longevity. Certain

Advertising Feature

# Forever young human cells

foods contain natural ingredients that can help protect against ageing. Specific foods slow the effects of time, while others speed them up. In addition, foods can change the amounts of hormones in the body. In turn, these hormones play a critical role in many bodily functions.

Plants would be rapidly damaged by the sun if they did not have one chemical in their leaves: beta-carotene. As the sun batters down on leaves, free radicals form just as they do in your skin, but beta-carotene removes the free radicals before they can cause damage. Beta-carotene is a vital chemical all chlorophyll-containing plants use to neutralise free radicals.

Each cell in the human body has an entire antioxidant system that it uses to neutralise free radicals. Beta-carotene is just one of them. Vitamin C circulates in the bloodstream and is a potent weapon against free radicals.

Even if a cell could repair itself completely, it would not last indefinitely. Cells of an adult are programmed at a certain stage to self-destruct. All cells have this fate except the human adult stem cells.

A forever-young tissue in the body is not a myth; it is a daily reality for researchers round the world. The adult stem cells (from a living person and not from an embryo) are cells which serve as a sort of repair.

Stem cells are un-specialised cells that can renew themselves indefinitely and, under the right con-

ditions, can develop into more mature cells with specialised functions. Stem cells are the 'master cells' that could, in theory, be used to produce virtually any type of replacement tissue.

Hall and Watt, in 1989, showed that stem cells are considered to possess self-replicating potential and the ability to give rise to terminally differentiated cells of brain, muscle and blood. These 'pluripotent' cells can, theoretically, divide without limit so long as the person is still alive. Since they can be harvested from the patient, potential ethical issues and immunogenic rejection are averted.

Researchers at Bioengineering Laboratory, UCLA School of Medicine, succeeded in cultivating them in a state of perpetual infancy. They extracted stem cells from lipospirate. They found that removed liposuction fat contains a high number of adult stem cells. Stem cells derived from fat - or, adipose tissue, as scientists like to call it - are not only easy to obtain, but seem to lend themselves to a number of potential uses. Adipose-derived stem cells have the ability to differentiate into chondrocytes (cartilage cells), myocytes (muscle

cle loss, replace damaged or missing bone, and repair damaged heart muscle. Researchers have been on a quest to find better ways to use adult stem cells, largely because they are free of the ethical baggage. Scientists found that a half-pound of the fatty substance yielded as many as 50 million to 100 million undifferentiated stem-like cells. They have discovered a 'cocktail' of growth factors that expands the number of stem cells they can grow in the laboratory at least 10 times beyond what anyone has done before.

Researchers said injecting the adult stem cells into the area of damage can achieve cellular regeneration and constitute one of the first therapeutic uses. It is still a crude way to use these cells but it could work.

A French plastic surgeon, Dr. Roger Amar, is using this algorithm to repair and rejuvenate his patients for plastic, reconstructive and aesthetic indications. He called his technique FAMI, which stands for fat autograft muscle injection.

FAMI is the rejuvenation technique that was launched in 1998 at more than 35 meetings and confer-



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derived stem cells have the ability to differentiate into chondrocytes (cartilage cells), myocytes (muscle cells) and osteoblasts (bone cells).

Adult stem cells are found in various tissues. Fat is a particularly rich source. Each 400g of tissue harvested during liposuction yields an average of 200 million nucleated cells, which can double in number every 50 hours.

Liposuction is intended as a cosmetic plastic surgery procedure to get rid of unwanted fat, but researchers have found that there may be a benefit of keeping the fat for stem cell research.

The hope for stem cells extracted from liposuction fat is to be able to grow new cartilage, restore mus-

FAMI is the rejuvenation technique that was launched in 1998 at more than 35 meetings and conferences all over the world.

Juvenilising facial tissues by injecting autologous cells is the best prevention technique of ageing. Since giving back a youthful shape is the main goal of all the invasive surgery of the face, one can tell that FAMI is the best for grafting forever young cells into the best vascularised areas of the face.

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