

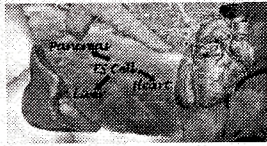
## Writing for the McMaster Meducator

Writing for the McMaster Meducator is a rewarding and valuable experience. It combines exploration of medical research and health ethics with the excitement and prestige of publishing work for the McMaster community to read. The opportunity is ideal for those considering a future in medical research, health ethics, or any profession within the health care field. The McMaster Meducator provides quality educational feedback and promotes in-depth exploration into a particular topic of interest.

If you are interested in writing and publishing with us, please e-mail us at [mac.meducator@learnlink.mcmaster.ca](mailto:mac.meducator@learnlink.mcmaster.ca) for more information.

To access our past issues, our writers' guide or current medical research and health ethics news, please visit our website at [www.meducator.org](http://www.meducator.org).

## Stem Cell 'Secret of Youth' Found

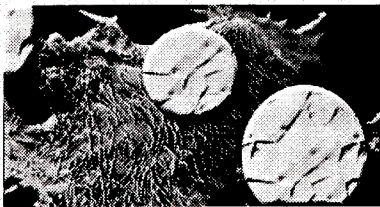


Ali Brivanlou and his colleagues from Rockefeller University in New York believe that they may have found a partial solution to the stem cell problem.

Human embryonic stem (ES) cells have been touted as the most promisingly treatment to illnesses ranging from multiple sclerosis to Parkinson's Disease. ES cells have the ability to develop into almost any type of cell in the body, and can potentially replace damaged tissues or organs. However, there are several practical barriers to the use of ES cells in humans. Scientists have yet to learn to control the type of cell into which the ES cells will differentiate, and more importantly, the conditions in which ES cells are cultivated require them to be contaminated with mouse proteins. In order to be exploited for therapies, the stem cell lines cannot have been grown in foreign proteins.

Brivanlou isolated a chemical from a sea snail, called BIO, which stops ES cells from developing into specialized adults cells by activating a set of protein signals called the Wnt pathway. BIO can be used to control the timing of the development of ES cells, and might also eliminate the need for mouse proteins. Although its potential is still largely uncertain, BIO brings scientists one step closer to taking stem cells into the clinical setting. (Source: <http://www.nature.com/nsu/031222/031222-4.html>)

## Emerging Medicine: Scientists Design Gold "Nanoshells" That Seek and Destroy Tumours



According to Naomi Halas, an electrical engineer and chemistry professor at Rice University in Houston, the future of cancer treatment can be found in a tiny, golden capsule.

Invented by Halas, nanoshells are 100-nanometer-wide spheres with layered gold atoms surrounding a silica core that can be attached to tumours. By altering the thickness ratio between the inner glass core and outer gold layer, nanoshells can be manipulated to absorb near-infrared light, heat up, and "cook" the tumour without burning the surrounding tissues. Precision is further enhanced as nanoshells can also be employed to release drug doses directly into the bloodstream. Not only can nanoshell technology be used for early detection, but patients with early-stage, contained tumours can also be diagnosed and treated in the same day. Although healthy cells in the vicinity of tumour will still die, nanoshells present a more favourable alternative to the current surgical and chemotherapy treatments.

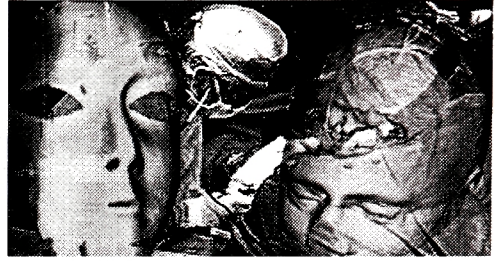
Halas and her colleague Jennifer West was recently awarded a \$3 million research grant by the Department of Defence to use nanoshells to develop an effective treatment for breast cancer. There are plans to begin trials on patients with breast, brain, or prostate cancer as early as next year.

(Source: <http://www.popsci.com/popsci/medicine/article/0,12543,537964,00.html>)



## Louisville Doctors Studying Face Transplants Weigh Ethical Issues

The movie "Face/Off" brought the idea of face transplants mainstream, but it has also fuelled misconceptions about the procedure. Face transplants are often mistaken as a form of plastic or reconstructive surgery. While the latter alter the shape of facial features and repair facial skin deformities using skin from elsewhere on the individual's body, face transplants are much more complex and intricate.



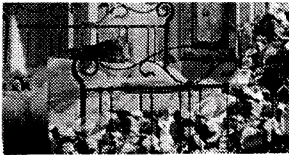
In Louisville, study of the procedure has been ongoing for the past decade, along with other innovative work such as hand transplant techniques, tissue rejection, and other related problems, which have all contributed to the research and work on face transplants. Doctors hope that the success of hand transplants would pave way for the acceptance of face transplants

Face transplants involve removing all the layers of skin and corresponding blood vessels, nerve, muscles and tendons from the donor, positioning the "envelope" of face over the recipient's bone and cartilage structure, and painstakingly grafting it into place. Similar to other organ transplants, there is great risk of the body's immunological rejection of the new face. Even if the transplant is successful, the recipient is condemned to a life-long regimen of drugs to counter the possibility of rejection.

Although doctors claim that it is the "most careful, safest procedure", public acceptance is necessary before proceeding. Unlike other organ transplants, surgically transplanting an entire face from one person to another raises many ethical and psychological issues. The impact on friends and family of seeing the face of the deceased on another person must also be considered. Face transplants go beyond altering facial features because the face is fundamental in the constitution of identity. Doctors are adamant about educating the public on the purpose of face transplants, emphasizing that the procedure presents an option for individuals whose face has been severely disfigured from burns, cancer, or accidents, but will not be used to satisfy the narcissistic desires of the wealthy.

(Source: <http://www.courier-journal.com/localnews/2003/11/16ky/wir-front-face1116-12650.html>)

## How Sex and Love Light Up the Brain: We All Enjoy Sex the Same Way Except When We Are in Love



Researchers have used positron emission tomography (PET scans) to distinguish the difference between a real and a fake orgasm, a phenomenon that is unique to women. While the ventral tegmental area (VTA), the reward centre and periaqueductal grey matter (PAG), the region of the brain that controls the fight-or-flight responses are activated in both cases, the region of the cerebellum is not stimulated in a fake orgasm. Instead, a fake orgasm activates areas of the brain that are involved in control of muscles. Further research may yield new methods to treat sexual dysfunction in women.

In contrast, it was found that in men the amygdala, the area of the brain that controls fear, becomes less active and the VTA becomes active just before ejaculation. New studies using functional magnetic resonance imaging (fMRI) have shown that the same areas of the brain are activated in heterosexual and homosexual men during arousal.

When the emphasis of relationships shifts from the physical to the emotional, different regions of the brain are activated. Although the VTA is still activated, love also activates areas in the brain associated with attention and memory recall in women, and areas associated with vision in men. It is hypothesized that evolution has shaped the origin of passion: sex is used to find a mate, attraction conserves time and energy by focusing on one partner, and love enables couples to remain together to have and raise offspring.

(Source: [http://www.thestar.ca/NASApp/cs/ContentServer?pagename=thestar/Layout/Article\\_Type1&c=Article&cid=1069846285948&call\\_pageid=991479973472&col=991929131147](http://www.thestar.ca/NASApp/cs/ContentServer?pagename=thestar/Layout/Article_Type1&c=Article&cid=1069846285948&call_pageid=991479973472&col=991929131147))