New Device to Prevent Sleepiness in Drivers

A Taiwan biotechnology and medical devices company has recently developed a microcomputer stimulation device which could prevent a driver from dozing off while on the road, thereby helping to reduce the number of traffic accidents caused by fatigue drivers which accounts for one in four traffic accidents.

Developed by a subsidiary of Taiwan’s Royal Electric Group, this watch-like device can be attached to the wrist and emits an electric pulse if one’s wrist is idle for 10–15 seconds. Meanwhile, it is programmable and can automatically vibrate or emit an electric pulse after a specific period of time, in this way it helps to prevent a person from napping.

The carbon safety strip that conducts the electric current has won approval by the US Food and Drug Administration, while the American Federal Communications Commission and authorities in the European Union have already approved the device.

When people fall asleep, they will not make any conscious movement of their wrists, the simulator will produce an electric current around 35–50 volts, after the wrist remains idle for 10–15 seconds. According to the Deputy Head of the Royal Electric Group, Fu Yu Sung, this electrical signal is sufficient to stimulate nerves under the skin and cause a feeling of numbness.

World First Two-Color Fluorescent Fish

Taiwan — Taikong Corp recently unveiled its latest strain of bio-engineered 2-color fluorescent zebra fish, which emits both green and red florescence, following the success in the gene-splicing ventures with Institute of Fisheries Science, National Taiwan University’s (NTU).

Presently, the orders secured for Taikong’s single color glowing killifish were worth more than US$2.8 million.

Prof. Tsai Huai Jan of NTU stumbled on the innovation while working with genetically modified fish for medical research. Tsai used a fluorescent protein extracted from jellyfish as a genetic marker, attaching it to DNA in embryonic zebra fish for easier microscopic identification.

In developing the fluorescent zebra fish, luminous genes were extracted from green jellyfish and red coral, and later transferred to a fish embryo via micro-injection. According to Prof. Tsai, this green-and-red glowing fish is the first of its kind in the world.

Prior to commercial release, the team spent 1.5 years to sterilize the new species in order to prevent cross breeding with wild/natural strains. Prof. Tsai stressed that the procedure was necessary so that ecological balance will not be disturbed. Meantime, the sterilized fluorescent fish, if abandoned in nature and eaten by other fish, would not affect the food chain or biodiversity.

Taiwan was a net exporter of ornamental fish as early as the 1960s and growing domestic consumption had led to the industry’s boom by late 1980s. Over the past few years, however, the economic slump forced many fish farmers to go back to exporting.

Taiwan’s Council of Agriculture hopes that the genetically modified ornamental fish would help to transform the tropical fish industry on the island.

Price Hike for Cigarettes in Korea

In support of the Korean Government’s “No Smoking Policy”, the Korea’s Ministry for Health and Welfare will revise and increase the price of cigarettes. Under present practice, a pack of cigarettes ranges from 1500–2500 won (US$1.2–2.1), the new revised pricing will start from 3000 won (US$2.5).

According to Kim Hwa-joong, Minister for Health and Welfare, the tobacco prices in Korea are some 20–25 percent cheaper than other countries. It is hoped that the price hike will discourage people from smoking.

Meanwhile, the Korean Ministry is also considering to apply the Framework Convention on Tobacco Control (FCTC), a global tobacco-control pact, for amending related laws.
The FCTC requires countries to impose restrictions on tobacco advertising, sponsorship and promotion, establish new labeling and indoor air controls as well as enact stricter legislation to clamp down on tobacco smuggling.

**Research News**

### Australia

#### Innovative Nutrients Recovery Technology

Scientists from the Food Science Australia have successfully invented an innovative way, after ten years of effort, to recover and purify nutrients from food manufacturing waste, using a breakthrough technology developed by the team from Center for Advanced Food Research (CAFR), University of Western Australia (UWA). The Diary Research Development Corporation pumped in AUD2.5 million (US$1.6 million) in support of this project.

According to A/Prof. Jim Hourigan, CAFR, each year the Australian food manufacturing industry generates billions of liters of wastes containing potentially valuable materials, such as vitamins and minerals, which difficult or expensive to recover from food process streams.

Essentially, this technology works in four phases, namely iron exchange, nano-filtration, chromatography and crystallization to isolate the useful products from powdery whey, explained Dr. Rosalie Durham, Research Fellow with CAFR.

Traditionally, Australian cheese manufacturers convert thousands of tons of whey into low-lactose and discard the whey powder as waste. This new technology helps to extract high-value, refine, and pharmaceutical grade lactose that can be used in making powder inhalers and other medicines. In addition, the team also extends the technology to obtain other soluble whey minerals and calcium salts from powder whey.

This innovation has been awarded for Excellence at the Knowledge Commercialization Australasia by the Environmental Science Technology Sector Award and has caused excitement among the scientists in Australia and overseas.

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### Japan

#### Japan’s Progress in Regenerative Medicine

Kyoto — Researchers from the Institute for Frontier Medical Sciences, Kyoto University, have revealed the success in cultivating Japan’s first embryonic stem (ES) cells. To date, Kyoto University is the only establishment that the science ministry allows to manufacture ES cells. Sources said the research institute intends to make the ES cells free by October 2003 for all Japanese research facilities, which are accompanying with specific approval from the Ministry of Education, Culture, Sports, Science and Technology.

The first batch of ES cells are made using ten frozen fertilized eggs donated by a couple, in January 2003, whose identity has been protected. Out of the ten fertilized eggs, only one manage to reach blastocyst stage, a hollow sphere that forms when a fertilized egg divides, transforming from a fertilized egg into an embryo. The cells collected from this stage had been confirmed to be ES cells because these cells later differentiate into nerves and pigment cells.

It will be essential for Kyoto University to have an assured ongoing supply of fertilized egg to support this project because the first batch of ES cells will eventually lose the ability to regenerate/multiply after some time. Consequently, the group is looking for donors. In the meantime, the Education Ministry has drafted strict rules and regulations to protect the privacy of donors for ES cells experiments.

Human ES cells were first cultivated in 1998 by the University of Wisconsin, and research on the subject has continued in the United States, Europe and Asia. All the while, Japan has been relying on US for the supply of ES cells. According to Dr. Tetsuya Tateishi, Head of the Japanese Society for Regenerative Medicine, this latest success marks a milestone in Japan’s Regenerative Medicine. The team plans to generate another five types of ES cells in an effort to add varieties to support the regenerative research in Japan.

However, this new ES cells may not yield immediate usefulness since little are understood about the substance/factor that induces various specific differentiation of the ES cell to form different cell types, said Dr. Tateishi. Moreover, this process involves the ethical issues using human fertilized eggs and the possible risk of viral infection during cultivation.