SCIENTISTS OBTAIN WATTS FROM WASTEWATER

Compiled Mike Lafferty

Pennsylvania State University scientists have developed a device that turns untreated sewage into electricity. The research appears in last week's edition of Environmental Science & Technology.

Similar to a hydrogen-fuel cell, the microbial-fuel cell captures electrons that are released by bacteria as they digest organic matter and converts the electrons into electrical current. Power output is low now, but the scientists say the technology is improving and eventually could be used to run a small wastewater treatment plant or to treat waste from animal farms, food-processing plants or human space missions.

Protein helps form long-term memory

A single protein appears central to the formation of the long-term memories people need to learn, according to scientists at the National Institute of Child Health and Human Development. The protein, known as mature brain-derived neurotrophic factor, appears to boost the ability of neurons to communicate with one another. The discovery could allow the development of medications to help people with learning and memory disorders. The findings appeared in a recent issue of Science.

Immunity problem may cause clones' death

Scientists at the University of Missouri at Columbia have discovered a problem with the way the immune system operates in cloned animals. The discovery could explain higher death rates observed in cloned animals and could lead to improved success in keeping the animals alive. Cloned animals are vital in a variety of research applications from treating deadly diseases to the process that makes organ transplants between animals and humans possible. The discovery was made with miniature swine injected with bacterial material that triggers specific immune reactions.

Device brings quantum computers step closer

Purdue University physicists have built a critical component for the development of quantum computers, potentially bringing advances in cryptography and high-speed database searches a step closer. The device splits a stream of quantum objects such as electrons into two streams depending on their spin. By producing such "spin-polarized" streams, the tiny device could become a key component in quantum computers, which have not yet left the drawing boards of the computer industry, but are highly desired for their potential facility at cracking codes and searching large databases. The research appears in the current issue of the journal Physics Review Letters.