


News in Brief
'Human Stomach' Machine Developed

A machine, which works as an accurate working model of a human stomach, has been developed by researchers at the Institute of Food Research in Norwich.

The Dynamic Gastric Model mimics key processes taking place in the stomach, including the complex biochemical conditions and gastric forces, BBC reported.

The scientists developed the machine to help them study human digestion.

The machine, which took more than 10 years to build, will also be used to test medicines in the digestive system.

Makers hope the tool will act as an ethical alternative to animal testing in the pharmaceutical industry.

"Everyone thinks of the stomach as just a bag full of fluids and enzymes, but it's a very complicated organ and this machine replicates those complexities exactly," said Martin Stocks, spokesman for Plant Biosciences Ltd which is marketing the product.

It was originally devised for the food science community as a tool to look at how food is processed by the stomach. But its most valuable utility has turned out to be for the pharmaceutical industry to examine how drug formulations work when they are taken into the stomach.

"This is very definitely a world first and we are currently focused on developing this aspect of the market," he said.

Bony Breakthrough

Scientists in Italy have discovered a way of making artificial replacement bones out of wood.

Early trials on sheep have showed encouraging results, BBC reported.

The team behind the program hopes the new bones will soon be available for patients whose own bones have been damaged by accident or disease.

Diabetic Contact Lenses

A biochemical engineer at the University of Western Ontario has developed contact lenses that change color in response to spikes and dips in the wearer's glucose levels.

The secret: Ultra-teeny nanoparticles that react chemically with glucose molecules in tears to produce a shift in hue.

According to Econtone, the nanocomposite hydrogel lenses, which could render those pesky e-waste-generating blood-glucose meters obsolete, will allow diabetics to monitor potentially life-threatening variations in their sugar levels without missing a thing.


Lobster-Like Creature Eats Wood

In the deep sea, food is scarce and the menu short—so short that at least one organism eats the table along with the fare. In fact, the table may be the main course for Munidopsis andamanica, a crustacean known as a "squat lobster", related to true lobsters.

Although the 850-plus squat lobster species are thought to be generalist scavengers, M. andamanica is the first to be found that eats wood, LiveScience reported.

If that seems an improbable diet for a deep-sea crustacean, consider that most logs that wash out to sea eventually sink, delivering precious nutrients to the seafloor in irregular loads that biologists have lately recognized as important ecosystems.

M. andamanica found elsewhere had bits of plant matter, algae and coral in their guts. The research team, led by Caroline Hoyoux, thinks the crustaceans specialize in hard-to-digest food, wood being their favorite fodder, garnished with bacteria or fungi. In a habitat as barren as the deep sea, it seems no meal is too tough to pass up.

Expressions in Motion
Worth a Thousand Words

Communication is a central aspect of everyday life, a fact that is reflected in the wide variety of ways that people exchange information, not only with words, but also using their face and body.

Scientists from the Max Planck Institute for Biological Cybernetics in Tübingen, Germany, found that people are able to recognize facial expressions in motion—for example, in a movie—far better than in a static photograph.

The video sequence needs to be at least as long as one-tenth of a second to gain this dynamic advantage, ScienceDaily reported.

A facial expression can state a lot. A nod indicates understanding, a frown may say: "Please explain that again!"

Scientists from the Max Planck Institute for Biological Cybernetics discovered that people are able to classify an expression much better when it moves naturally rather than when it is "frozen" in a photograph.

In order to gain the advantage of dynamic information, people need to see the expression moving for at least 100 milliseconds. If the video sequence is shorter, human brain is less capable of interpreting the facial motion.

Some expressions rely on changes in head orientation, for example, a nod or a shake of the head, others on the complex deformation of facial parts, such as the wrinkling of nose to signal disgust or frown.


Stop Indiscriminate Use Of Vitamin E

A research group from Tel Aviv University has done the most comprehensive and accurate study of clinical data on Vitamin E use and heart disease to date, and it warns that indiscriminate use of high-dose Vitamin E supplementation does more harm than good.

"There were so many conflicting reports about Vitamin E and its effect on various diseases, particularly heart disease, that we wanted to set the record straight," says Prof. Dov Lichtenberg of TAU's Sackler School of Medicine, Physorg reported.

"Our new study shows that some people may be harmed by the treatment, whereas others may benefit from it. Now we're trying to identify groups of people that are most likely to benefit from the effects of Vitamin E," adds study co-researcher, Dr. Ilya Pinchuk.

Applying a very different approach than any previous study, the team of researchers put their heads together to draw definitive conclusions about Vitamin E.

In an article published in Arteriosclerosis, Thrombosis, and Vascular Biology, the Tel Aviv University researchers evaluated the results of the prominent studies measuring the health benefits of Vitamin E but reached varying conclusions.

"Our major finding," says Dr. Pinchuk, "was that the average quality-adjusted life years (QALY) of Vitamin E-supplemented individuals was 0.30 less than that of untreated people. This, of course, does not mean that everybody consuming Vitamin E shortens their life by almost 4 months. But on average, the quality-adjusted longevity is lower for vitamin-treated people. This says something significant."

1st Artificial Windpipe On the Way

Iranian scientists announced that the first artificial windpipe in the world will be ready for transplant in February.

Ali Akbar Velayati, the head of Masih Daneshvari Hospital, told Fars News Agency that Iranians are the first in the world to have succeeded in developing a whole artificial windpipe (trachea), adding that the organ already developed in Spain was a bronchiole rather than a trachea.

"While tracheal transplantation is routinely performed in our center, finding an accurate trachea that matches the receivers' condition is rather difficult. These patients, moreover, are forced to use different types of medication throughout their lives," he said.

Velayati noted that the artificial trachea is designed to save the life of individuals who do not respond to exist-

ing treatments and surgeries.

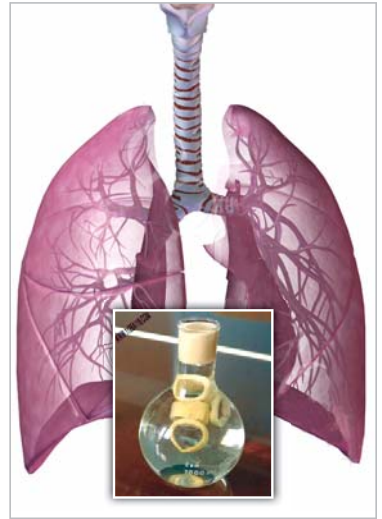
Apart from patients with respiratory diseases, chemically wounded veterans may also benefit from such tracheas.

"The patient's own stem cells are used in this innovative trachea, a trick that has overcome many of the problems caused by the existing techniques," he added.

In this innovative technique, Jalaeddin Qanavi and his colleagues used polymers to produce structures similar to tracheal cartilages.

In order to produce the cells, stem cells were extracted from the patient and then cultured on this cell-free structure.

According to Qanavi, these stem cells were cultured in the patient's own abdomen for six months before being transplanted on the damaged trachea.



Iranians are the first in the world to have succeeded in developing a whole artificial windpipe (Inset) while the organ developed in Spain was a bronchiole.

Fuel Derived From Algae at Shiraz University

Researchers at Shiraz University succeeded in producing green fuel from the algae Chlamydomonas in Fars province.

The researchers registered the genotype of Chlamydomonas in the National Center for Biotechnology Information (NCBI).

Chlamydomonas is a genus of unicellular green algae.

Dr. Mohammad Hossein Morovat, the project manager, also told ISNA that biodiesel is a clean fuel derived from natural and recyclable sources like vegetable oils or animal fats.

"The biodiesel was obtained through fatty acids with long hydrocarbon chains," he said.

Biodiesels are recoverable, non-toxic, recyclable and generate few carcinogenic particles compared to

ordinary fuels.

Referring to the limitation of fossil fuels, which are regarded as the main source of domestic and industrial consumption, Morovat said, "Iran and many other countries are seeking new energy sources like biofuels."

The production of biofuels from algae and other sources is the only resource humans hope to have in future.

During photosynthesis, algae and other photosynthetic organisms capture carbon dioxide and sunlight, and convert it into oxygen and biomass.

These fuels do not affect fresh water resources, can be produced using ocean and wastewater, are biodegradable and relatively harmless to the environment if spilled.



Breast-Feeding Best for Baby, Mom

Reports on the benefits of breast-feeding continue to accumulate, as researchers evaluate the breast-over-bottle option.

It's been shown to help a baby's later performance in school, to reduce the odds of problem behavior and to help kids cope with stress. And moms stand to benefit later on as well, studies show, HealthDay reported.

For starters, breast milk is loaded with health-promoting nutrients. "It's not just one mechanism," said Melinda Johnson, a lecturer in nutrition at Arizona State University.

"The nutrition [provided by breast-feeding] is perfect for the growing child." "DHA is critical for brain development and also for nervous system development," Johnson said.

The presence of DHA in breast milk, she said, might explain the finding that breast-fed kids do better academically.

Breast milk also contains the amino acid taurine, considered important for neurological development, said Dr.

Ruth Lawrence, from the University of Rochester School of Medicine and Dentistry in New York.

"Newborns and preemies cannot manufacture taurine," Lawrence said, although adults do. "Taurine is one of the amino acids needed for brain growth. The brain will double in size in the first year of life."

That makes it critical to have nutrients that help brain growth.

"We in the breast-feeding field have been focusing on brain growth [and its importance] for a number of years," she said.

Those who manufacture formula, Lawrence said, focus more on how much weight babies can gain with their product.

Breast milk also has been shown to jump-start a baby's immune system, and researchers think that's due at least in part to a protein found in breast milk. Called soluble CD14, it helps develop beta cells, a type of immune cell that helps produce antibodies, which are needed to protect against illnesses.

Breast milk also contains live and active organisms that

can never be duplicated in formula, Johnson said. In one of the newer areas of research, experts have found that breast-fed babies' guts have different bacteria than those of formula-fed babies, and that the breast-fed babies' gut bacteria appears to be healthier, she said.

Other research has found that the intestinal bacteria present early in life play a role in whether a person will suffer from allergies, have an overactive immune system or tend to put on excess weight later in life, Johnson said.

Breast-feeding also has emotional and bonding benefits, according to Lawrence and Johnson, although they say it's hard to explain the "why" and "how" of those.

Though a mother who bottle-feeds also holds her baby, the child has actual physical attachment while breast-feeding.

"Certain hormones, feel-good hormones, are released when a woman is breast-feeding," Johnson said, citing oxytocin and prolactin as examples. "The theory is, that's how the moms bond."

DHA has also been linked to mood, she said, and "if you have the right amount of DHA, you may be heading off mood disorders".