

# Iranians use 3D printing to produce nano scaffolds

Iranian researchers from Sharif University of Technology, in association with their colleagues from Max Planck Institute, Germany, produced nanocomposite scaffolds for tissue engineering with controlled pores by using indirect three-dimensional printing method. Cells are naturally surrounded by extracellular matrix (ECM) that supports and guides cellular behavior and its vital functions, including migration, adhesion, proliferation and differentiation with the

help of chemical and physical signals, Fars News Agency reported.

Therefore, the designing of internal pores and controlling external dimensions of the scaffold are the most important and effective parameters for assessing the performance of tissue engineering scaffolds used in the treatment of bone damage to guide cellular behavior in interaction with ECM.

In this research, nanocomposite scaffolds with controlled pore structure were

produced through indirect three-dimensional printing method. The pores contained nanoparticles such as titanium dioxide and bioactive glass of micrometric and nanometric size. Growth kinetics of bone tissue was investigated on the product through in-vitro tests. To this end, the cast was made with three-dimensional structures and its surface was coated with paraffin.

Results of the research showed that the effective interface of particles and cells

increase as nanoparticles is added to the polymeric bed due to the high tendency of nanoparticles to accumulate on the surface.

Moreover, nanoparticles affect cell adhesion, proliferation and differentiation by creating nanotopography and increasing coarseness and surface roughness.

Results of the research have been published in Journal of Biomedical Materials Research, vol. 101, 2013, pp. 2,796-2,806.

## Simple, cost-effective method for producing nanopowder

Iranian researchers at the Institute for Advanced Studies in Basic Sciences (IASBS), Zanjan, have succeeded in producing manganese oxide nanopowder through a simple, cost-effective and environmental-friendly method.

The product has wide applications in petrochemical and battery production industries, Fars News Agency reported.

Given the wide applications of the product, researchers sought a simple and inexpensive method to produce a special type of manganese oxide. They also investigated the oxidation activity of water in the presence of

manganese oxide.

According to Dr. Mohammad Mehdi Najafpour, one of the researchers of the project, most methods to produce manganese oxide require surfactant organic solvents and high temperature. However, a simple method has been developed, which is mostly based on the use of high temperature in the production of common metal oxides.

The research showed cheap compounds of manganese can be degraded to manganese nano-oxides in the presence of humidity at temperatures of around 100°C or less.

The researchers realized that manganese nano-oxides start to form after a few hours when a thick solution of manganese nitrate is kept at 70-90°C.

Results of the research showed that manganese nano-oxides produced in the presence of various oxidants oxidize water to oxygen, and alkenes to epoxides. The rate and efficiency of the reactions showed a significant increase compared to samples at micrometric scale. This is because of reduction in the size of nanoparticles.

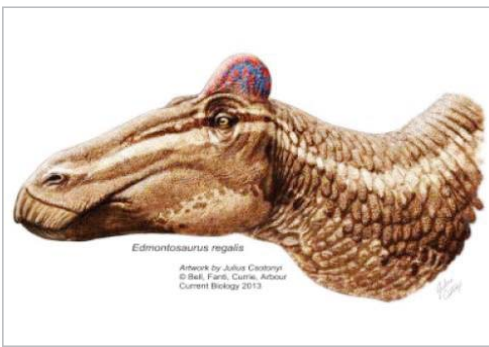
Results of the research have been published in Dalton Transactions, vol. 41, issue 36, July 2012, pp. 11,026-11,031.

## Duck-billed dinosaurs had rooster-like comb

A rare, mummified specimen of the duck-billed dinosaur *Edmontosaurus regalis* described in the Cell Press journal *Current Biology* on December 12 shows for the first time that those dinosaurs' heads were adorned with a fleshy comb, most similar to the roosters' red crest.

The most common dinosaurs in North America between 75 and 65 million years ago, duck-billed dinosaurs were gentle giants, about 12 meters long, and filled the same ecological role that kangaroos or deer play today. But no one had suspected that they—or other dinosaurs, for that matter—had fleshy structures on the tops of their heads, *NewScientist* reported.

"Until now, there has been no evidence for bizarre soft-tissue display structures among dinosaurs; these findings dramatically alter our perception of the appearance and behavior of this well-known dinosaur and allow us to comment on the evolution of head crests in this group," says Phil Bell from Australia's University of New England. "It also raises the thought-provoking possibility



of similar crests among other dinosaurs."

The dinosaur specimen in question was found in deposits west of the city of Grande Prairie in west-central Alberta, Canada. Bell, along with Federico Fanti from the University of Bo-

logna, Italy, knew they had something special when they found skin impressions on parts of the mummified body. But it wasn't until Bell put a chisel through the top of the crest that he realized they really had something incredible.

"An elephant's trunk or a rooster's crest might never fossilize because there's no bone in them," Bell explains. "This is equivalent to discovering for the first time that elephants had trunks. We have lots of skulls of *Edmontosaurus*, but there are no clues on them that suggest they might have had a big fleshy crest. There's no reason that other strange fleshy structures couldn't have been present on a whole range of other dinosaurs, including *T. rex* or *Triceratops*."

Of course, it's hard to tell what that cocks comb might have done for the duck-billed dinosaurs. In roosters and some other birds, bright red crests are a way to get the girls. "We might imagine a pair of male *Edmontosaurus* sizing each other up, bellowing, and showing off their head gear to see who was the dominant male and who is in charge of the herd," Bell says.

We may never know exactly, but the new study is a useful reminder of just how bizarre and amazing dinosaurs really were, the researchers say. There is much left to discover.

## Wink Glasses help protect computer users' eyes

Wink Glasses 2013 spectacles do wink by fogging up for a split second. Made by Masunaga Optical of Japan, they're designed to force computer users who suffer from dry eyes to blink at regular intervals, CNET wrote.

The Wink becomes opaque for 0.1 or 0.2 second every 10 seconds, and is targeted at people who develop eye strain by staring at computer screens all day, which would seem to be a good chunk of humanity.



So-called computer vision syndrome can cause a range of temporary symptoms from headache to dry eyes to double vision.

Designed by industrial designer Kazuo Kawasaki, the Wink glasses look normal enough, but they weigh slightly more than regular eyeglasses. The lenses are covered with liquid crystal sheets, and there's a small battery in the left arm.

When the glasses are in fogging mode, activated by a small button on the right arm, the battery's weak electrical current in the liquid crystal sheets gets cut off, momentarily fogging them and inducing a reflexive blink.

The Wink Glasses 2013 simplifies an earlier model that had an internal blink sensor which would trigger the fog; it had to be calibrated for individual users.

The latest iteration sells for about \$150 in Japan, and can be fitted with prescription lenses for extra. IT companies and ophthalmologists have been ordering them.

## Portable scanning and printing tool

Copy & Paste is a portable scanning and printing tool with which you can literally perform the said function.



You don't need your heavy printer or a photocopier machine, Yanko Design wrote.

All you need is this handheld scanner that can transfer the images and text from one source to another source, but in the physical plane.

## Sea levels to rise eight feet by 2200

Sea levels will rise two feet within just 70 years and eight feet by the year 2200, according to a new study which suggests hundreds of coastal cities face being wiped out within a matter of generations.

Scientists now claim we have awoken a "sleeping giant" and that sea levels won't stop rising until they are between 25 to 30 feet higher than now, *Daily Mail* said.

Alarmingly those predictions are based on the assumption that levels of carbon dioxide in the atmosphere remain at what they are today. Some 600 million people currently live within 10 meters of present-day sea level and that area generates roughly 10 percent of the world's total GDP.



The combined effects of rising sea levels coupled with land subsidence and population growth mean that by the 2070s, the population exposed to flooding risk may have tripled.

Researchers found current rate of sea-level rise are roughly twice any other period between ice ages.

Meanwhile, levels of greenhouse gases in the atmosphere and other factors that cause temperatures to rise are increasing up to 10 times faster than at any other period before the industrial revolution.

Felco Rohling, a climate scientist at the Australian National University in Canberra, told *NBC News*: "We have awoken a sleeping giant; he is now here to stay."

The scientists say that as the earth continues to warm, the major ice sheets of Greenland and Antarctica will begin to melt, a process that takes a long time to start and stop.

The findings, reported in the journal *Scientific Reports*, are based on atmospheric carbon dioxide levels stabilizing at today's level of 400 parts per million.