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## MESSAGE FROM NEIL B. GODICK

The Russian labor market is suffering, with the jobless total, if hidden unemployment is taken into account, at nearly 20 per cent of the economically active population.

The number of all those out of work in Russia, including what is known as hidden unemployment, is estimated at 16 million people. This includes total unemployment as calculated according to the rules of the International Labor Organization (ILO). Direct unemployment is now about eight million people. Hidden unemployment has affected roughly the same number of people and continues to grow.

Data from the Health and Social Development Ministry, reports that the number of those officially registered as unemployed has fallen. But, this does not give grounds for optimism. "By and large, the figure for registered unemployment means absolutely nothing. It is simply that people losing their jobs are going to the labor exchange less. Therefore, this figure in no way reflects the real state of affairs. If we want to assess the social situation in the country, we cannot limit ourselves to data on registered unemployment," the Ministry said.

According to the Ministry, the danger that the hidden unemployment trend in Russia might escalate has been greatly underestimated. The hidden unemployment trend is very dangerous, but no-one in Russia takes it seriously. At state level, this phenomenon has not been subjected to any kind of monitoring.

As for a prediction for the situation in the second half of the year, the Ministry did not rule out that the index of total unemployment might stabilize, but they also said that hidden unemployment would continue to rise.

*We do not intend for these reports to solve any need our readers may have. We do intend to keep everyone current on technology developments in Russia. If you would like any additional information on any of the developments reported – send us a note.*

Nanopacking for semax

**RAS Institute of Molecular Genetics (IMG, Moscow) and**

**Lomonosov Moscow Institute of Fine Chemical Technology (Moscow)** have developed a technology to protect peptides from destruction and to overcome the hematoencephalic barrier. The idea is to encapsulate drugs in liposomes.

Neuropeptides are proteins that affect CNS function. They have been a research focus for many years. Semax favorably affects information assimilability, memory, and promotes brain function regeneration after apoplexy. However, neuropeptides have some disadvantages. They are quickly decomposed in the body and practically never reach the brain with blood. Therefore it is difficult to use them as drugs. To protect peptides from destruction and help them overcome the hematoencephalic barrier, IMG encapsulated the drug in liposomes. As they are lipids, they merge with cell membranes. Thus their contents can penetrate the hematoencephalic barrier.



The researchers encapsulated semax into liposomes from distearoylphosphatidylcholine or soy lipid mixtures. In the presence of protein-splitting enzymes isolated from rats' blood and brain, encapsulated semax decomposed significantly less than unencapsulated semax. Liposomes preserved up to 90 % of the protein. Protein preservation depends on the liposomes' biological medium, and on the liposomes' nature. By using them, it will be possible to deliver neuropeptides to central and peripheral nervous system cells. The work was sponsored by the RAS Presidium's fundamental research program *Molecular and Cellular Biology*, and also by the RF Presidential program supporting leading scientific schools.

#2010-06-093

Alcohol to help charge a notebook

**Saint-Petersburg State University (Saint-Petersburg)** studies metal nanoparticle inclusion into conducting polymers. Their developments involving catalytic reactions in fuel cells serve to develop alternative power sources.

Fuel cells provide several advantages. Unlike the limited energy stored in a voltaic cell, fuel cells' agents for electrochemical reactions are supplied from outside. This is important for supplying power to portable electronic devices in emergencies when they cannot be plugged into the mains. The University is testing fuels such as hydrogen peroxide, alcohol and oxygen. By producing catalysts based on metal nanoparticles, it is possible to considerably reduce their cost.

In the near future these fuels will be used as independent power sources. Currently the University is actively developing electrode materials for chemical sensors and energy-storage devices (power sources and fuel cells). These devices benefit from experiments on including metal nanoparticles into conducting polymers. Metals are good electricity conductors unlike polymers, which are mostly insulators. Conducting polymers combine both properties. Metal nanoparticles included in conducting polymers forms nanocomposites – hybrid materials with new properties. The application range for conducting polymers and nanocomposite materials is very wide. Polymer deposition on porous conducting matrices produce a substantial increase in chemical power sources' energy efficiency. Increased energy efficiency is a goal for portable power supplies.

The completed studies mostly deal with fundamental electrochemistry problems. The recent successes are connected with newly developed method for including noble metal (gold, silver, platinum) ions into conducting polymers. A patent was obtained for noble metal extraction; a patent application for invention is under evaluation.

#2010-06-094

Life-saving capsules for testing nuclear submarines and emergency operations

**Zvezdochka ship-repair yard (Severodvinsk)** has developed an additional life-saving capsule for testing nuclear submarines (NSM). This universal life-saving container with 30 places is designed to ensure people's safety during third and subsequent generation nuclear submarine deep-sea tests. During testing, it will be installed on the NSM body as an additional life-saving capsule for delivery trials committee members and testers' group. Standard NSM life-saving chambers are designed for the crew only, while deep-sea trials also call for shipyard specialists, designers and military personnel to be present.

#2010-06-096

Anti-tick clothing

**Russian Consumer Inspection Research Institute of Disinfectology (Moscow)** has started commercial production of special clothing that reliably protects against tick bites. So far the clothes have been produced for specialists working in wooded areas. In future they will be made available to everyone. Their special feature is impregnation with a special solution that is lethal for ticks and safe for humans.

Specialists distinguish four tick-borne infections: encephalitis,

borreliosis, granulocytic anaplasmosis and monocytic erlichiosis. Experts highlight the time factor - time after a tick bite. Once you find a tick on your body, it should be immediately removed with a thread shaped into a loop. It is absolutely wrong to do what most people think they should do in this case – pour oil on the bite. The captured tick should be brought to a lab, preferably in a vial with ice. Analysis will show whether the tick was infected or not.

#2010-06-097

A Russian chip capable of receiving GLONASS, GPS and Galileo signals

A three-system chip has been developed in Russia for receiving signals from all the three navigation systems (Russian GLONASS, American GPS and European Galileo). While GLONASS and GPS are in successful operation, the Galileo system development has not yet been embodied, so there is nothing to be received from there. In the Russian-American developed receiver, signals will be made available to Russia's general public free. In Europe they planned to make it a paid service.

Full-scale European global navigation satellite system Galileo operation will start in 2016. Orbital group deployment will continue until late 2014. In 2011 four satellites will be launched and the land-based project will be completed. Trial system operation is planned for 2014-2015, when the orbital grouping includes 18 satellites. It is expected that in June 2010 a European action plan for deploying Galileo's orbital and land-based segments will be approved.

#2010-06-098