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Dear ,

IN THIS ISSUE:	MESSAGE FROM NEIL B. GODICK
<p>Message from the President A plasma solution The cause of ageing identified Russian scientists identify a trigger gene Preparation based on coordination metal compounds Make your DNA-diagnosis with your own hands Early forest fire detection</p>	<p>More on demographics, family, and social trends</p> <p>Russia marked the Day of Married Love and Family Happiness last month amid a deepening demographic crisis and a record divorce rate. Touted as an alternative to Valentine's Day, which was imported from the West after the collapse of the Soviet Union, Family Day has yet to establish itself in Russia.</p> <p>Russia had the world's highest divorce rates in 2010, according to UN figures.</p> <p>Both central and regional governments have attempted to promote family stability in recent years in an effort to counter both a demographic crisis and shockingly high child abuse rates.</p> <p>Russia's population has shrunk from around 150 million in 1991 to just under 142 million today, with no sign of an upturn. Birthrates declined drastically after the Soviet collapse. Birthrates though improving are not yet at the level to maintain the current population. Only ten percent of Russians have more than three children. Three children per family are necessary for the population to stabilize.</p> <p>Since the late 1980s there has been a startling rise in child violence statistics. Some 2,000 children are killed by adults every year in Russia, many at the hands of parents or relatives.</p> <p>Alcohol abuse has been cited as a major cause of the partial disintegration of the family unit. According to official statistics, over 23,000 Russians die as a result of alcohol abuse every year.</p> <p>Smoking</p> <p>Russia is the world's most prolific smoking country. An average of 17 cigarettes per person, per day, are smoked.</p> <ul style="list-style-type: none">• 61% of men smoke• 22% of women smoke

	<ul style="list-style-type: none"> • 40% of woman continue smoking during their pregnancy • Most Russian bars and restaurants are smoker-friendly, exposing all guests to secondhand smoke. <p>One has to assume that the price of a pack of cigarettes (\$1.42) is a huge factor contributing to Russia’s smoking rates.</p> <p>Politics Russian style The Kremlin's chief political strategist stated last month that, “Prime Minister Vladimir Putin was sent to Russia by God to help his country during one of its most turbulent times.” Further he stated, “I honestly believe that Putin is a person who was sent to Russia by fate and by the Lord at a difficult time for Russia.” Additionally, “He (Putin was) preordained by fate to preserve our peoples”.</p> <p>It is only three months ago that a nun-like sect appeared in central Russia saying that Putin was a saint and a Savior.</p>
	<p><i>We do not intend for the following 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.</i></p>
<p>A plasma solution</p>	<p>Many current waste incineration plants emit huge dioxin and cyanide amounts into the atmosphere. Waste can be processed in a more ecologically clean way. Using plasma technologies, it can be processed into syngas, which is considered a less expensive and more effective liquefied natural gas analog. The RAS Institute of Electrophysics and Electric Power Engineering has developed novel plasma technologies.</p> <p>Dense low-temperature plasma (working range: 2,000 to 10,000 °C) is generated in plasmatrons. Then a plasma jet is introduced into a plasmachemical reactor with the agent to be processed. The reactor is an ordinary steel cylinder with an internal high-temperature ceramic coating. The plasma jet supplies energy required to convert a solid or liquid substance to its gaseous phase. Then it dissociates the gases molecules and atoms. As combustion must be avoided: the oxidizer supplied is just enough to form CO but not CO₂. The result is syngas – a hydrogen and CO mixture, which is combustible. Its energy content is lower than natural gas but its hydrogen-to-CO is optimal. Syngas can be used in gas turbines, diesel generators and heat-recovery boilers. Alternatively, by further catalysis, it can be used to produce synthetic fuel and various alcohols.</p> <p>Today plasma technologies are used to the best advantage in power engineering. But they can also be highly effective in new metallurgy, plasma chemistry, medicine and many other areas.</p> <p>#2011-07-172</p>
<p>The cause of ageing identified</p>	<p>Gamaleya Research Institute of Epidemiology and Microbiology conducts research into slowing the human ageing process. This</p>

	<p>inevitable process is related to excessive growth of certain cells in the body.</p> <p>Histological brain sections clearly show that human <i>grey cells</i> are inhomogeneous. Nervous cells (neurons) that ensure brain functioning are surrounded by a <i>filler</i> – connective glial cells (glia). With age, this substance undergoes irreversible changes: neurons die, while glial cells, on the contrary, proliferate. It is the neurons' loss that causes typical old-age signs – memory loss, movement incoordination and depressed reactivity. Experiments were performed placing murine brain extracts into test tubes with nutrient mediums to compare age-dependent glial cell growth. The extracts added were taken from a two-month-old (i.e., young) mouse, a ten-month-old (i.e., adult) and an 18-month old (i.e., elderly) mouse. In the second case the glial cell number was doubled, and in the third case it was 4–5 times higher. In another experiment the researchers tried to use the same biopreparations on young mice. As early as 3–4 months thereafter, the experimental rodents injected with an old mice's brain extract began to show clear premature ageing signs. When examined, their brains showed two most typical signs: neurons' loss and glial cells' intensified reproduction. In the experimental mice both processes led to much more pronounced results than in naturally aged rodents. All the data obtained directly indicated that the factor identified is the cause and not the consequence of ageing.</p> <p>Having obtained very convincing experimental results for mice, the scientists started human body studies. Blood samples were taken from people aged from 10 to 78. Serum was isolated from the blood and added to the same number of glial cells placed in test tubes. After a few days, changes in the glia were checked. Absolutely the same regularity was found as in mice. Blood serum taken from persons aged 10–20 did not provoke any increase in the glial cell number. Middle-aged persons' blood noticeably activated this process, while serum obtained from old-age persons ensured a heavy glia growth. Some of us have to face similar processes in real life – during blood transfusion. The tests completed to date give us good reason to believe that, during blood transfusion, the age factor should be taken into account.</p> <p>The research results earned the developers a diploma for discovery (<i>The Phenomenon of Ageing Factor Accumulation in Mammals</i>). The key goal now is to determine what this factor is (chemical nature, structure, reaction to external action). The next step would be to try to identify the gene responsible for its synthesis, and look for methods that would either inhibit this synthesis or reduce the body's ageing factor's biological. Judging by the data obtained, this gene is a small protein. Its invulnerability confirms the theory that ageing is absolutely inevitable.</p> <p>#2011-07-173</p>
<p>Russian scientists</p>	<p>According to Russian and international researchers, the psoriatic and</p>

<p>identify a trigger gene</p>	<p>atherosclerotic plaques' formation processes could have the same mechanisms. Russian scientists decided to find out what role is played by ATF family genes in atherosclerosis and psoriasis development. Specialists from Vavilov RAS Institute of General Genetics, Center of Biological Treatment Methods, RAS Center for Theoretical Problems of Physico-chemical Pharmacology and Sechenov First Moscow State Medical University established that these genes' activity really changes both in atherosclerotic plaques and in skin psoriatic plaques.</p> <p>For the experiment, the researchers used atherosclerosis plaques and the vessel's healthy part fragments, and also tiny skin fragments taken from patients' skin sections affected and unaffected by psoriasis. They identified the activity of two ATF family genes: ATF-3 and ATF-4. It was found that at atherosclerosis their activity in the affected vessel part was twice as high as in the unaffected. In patients with psoriasis the picture was reversed: in psoriatic plaques the genes activity was half of the healthy skin sections' activity.</p> <p>Samples were taken from patients suffering from various accompanying diseases including carcinomas and stomach and duodenal ulcers. However it was found that these pathologies, unlike psoriasis and atherosclerosis, did not affect ATF-3 and ATF-4 activity. Neither do changes in the genes' functioning intensity depend on psoriasis gravity or atherosclerosis development degree.</p> <p>Scientists explain these genes' effect as follows. ATF-3 plays an important role in destroying blood vessel lining cells during atherosclerosis, while ATF-4 activates ATF-3 functioning. The authors think that the difference in these genes' activity in atherosclerotic and psoriatic plaques makes it possible to use this indicator to diagnose both diseases.</p> <p>#2011-07-174</p>
<p>Preparation based on coordination metal compounds</p>	<p>FiBrMed Company develops and introduces innovative treatment methods. They developed <i>Silverol</i> – a novel preparation based on coordination metal compounds (silver, platinum, etc., salts). It has comprehensive antibacterial, virucidal and immunomodulating action, and enhanced therapeutic effect (cytostatic, antibacterial, virucidal). A very difficult problem was solved in the process: synergy between the preparation's components. Efficient transport agents (means to deliver the active component to tumor cells) were identified.</p> <p><i>Silverol</i> efficiently cures viral and bacterial diseases even if the pathogenic bacteria are resistant to ordinary antibiotics. Experiments on sick animals and control over the white blood cell and lymphocyte levels using hematological analysis unambiguously confirmed positive dynamics after the preparation was administered. The tests are carried out jointly with Tula, Krasnodar and Stavropol departments of agriculture.</p>

	<p>Physical characteristics: The preparation is a transparent liquid without any smell or color. It should be stored at 4 °C and protected from direct light.</p> <p>Application: to treat infectious and malignant diseases, 0.5%- or 1%-preparation solution is injected intravenously. The administration dose and duration depend on the animals' clinical status and must be determined under strict hematological control. For peroral administration for treatment and prophylaxis, 0.5% <i>Silverol</i> solution is added to water or feed.</p> <p>Testing is underway to use the preparation to treat or prevent cattle chlamydiosis, TB, viral leucosis and other viral and bacterial diseases. Trials are carried out on several large farms in various Russian federal districts. #2011-07-175</p>
<p>Make your DNA-diagnosis with your own hands</p>	<p>DNA-diagnosis is a relatively new diagnostic method. Mobile DNA-diagnosis, it is practically nonexistent in the world. The world's only mobile DNA analysis device can be found in the US Armed Forces. Its device weighs about 15 kg.</p> <p>In early March the rapid DNA-diagnosis technology developed by Maksigen Company was recognized as one of the best youth innovation projects in Russia. The National Association of Innovations and IT (NAIRIT) awarded it a grant for further development. The technology has two special features: 1) there is no need to purify DNA; 2) it uses a genetically engineered enzyme – mutant DNA polymerase.</p> <p>In Russia, to receive medical care, most patients must go to a district polyclinic. The clinics typically lack effective diagnostic facilities. A small device for rapid infectious diseases DNA diagnosis in the home has been partially developed. When completed it will be equipped with disposable plastic cartridges. The device is automatic and user-friendly. It displays results in 5–10 minutes. Another advantage is its very low error level – less than 2 %.</p> <p>A pilot sample for the device has been partially assembled. Completed pilot samples will be available in six months. The R&D project should complete within a year. The testing will take nine months. #2011-07-176</p>
<p>Early forest fire detection</p>	<p><i>Distantsionnyy Sistemy Kontrolya Company (Remote Control Systems)</i> develops and produces forest monitoring information systems for early forest fire detection. The systems are based on IP video surveillance, GIS technology, computer vision, wireless high-speed communication, mobile applications, client-server Internet technologies, etc.</p>

The system's core and company's principal product is *Lesnoy Dozor* software, which is sold as SaaS (Software as a Service) during the fire-hazardous season for monthly payment.

The entire service range is provided to deploy the system for forest monitoring and early fire detection. This includes system design, the equipment and after-sale service.

Lesnoy Dozor' unique features:

- Existing communication operators' towers, communication channels and many controlled cameras from any producers with different technical characteristics can be used (and also other devices: IR sensors, heat sensors, etc. to detect forest fires);
- A fire's precise coordinates can be automatically determined;
- Any information sources can be integrated into the system;
- Multiple users can work with the system.

Lesnoy Dozor has already been installed and is successfully functioning in seven Russian regions. Discussions are being conducted with most Russian regions, forest reserves and national parks, and with some FSU countries.

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