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THIS ISSUE:

MESSAGE FROM NEIL B. GODICK

Health and consumer rights activists are up in arms over the contents of legislation regulating the tobacco industry, saying it contradicts a UN convention that Russia signed in April.

The legislation would allow cigarette producers to continue to use the words "light," "super light" or "low tar" on packaging, something the activists and a UN representative said is in direct conflict with the UN convention.

The Association of Tobacco Producers, which proposed the new rules, denied that it was in breach of international commitments.

Opponents to the bill remain unsatisfied.

The Federal Consumer Protection Service has made an unsuccessful effort to block the labeling provisions in question, sending proposals to the Legislature through the Health and Social Development Ministry.

The bill was authored by tobacco producers and does require cigarette packages to carry two large health warnings in black letters on a white background. The warnings are much stronger than currently required.

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.

Health Sciences – Natural Supplements

The Arkhangelsk Seaweed Factory, Solovetsky, Arkhangelsk Region has always been *natural.* Using a long scythe for reaching down into White Sea waters employees harvest kelp leaves. Once on land the leaves are hung on shoreline racks to dry. They are then loaded onto a ship that will take them to the factory for processing.

The Arkhangelsk factory has been using kelp and other types of seaweed since 1918, employing seasonal workers to gather the raw material for iodine and other pharmaceutical and food ingredients.

For years, it produced only mannitol, a sugar alcohol diuretic that has many medical uses, and agar, a kind of vegetarian gelatin. These ingredients were sold in bulk to the pharmaceutical and food industries.

In the early 1990s when the Soviet Union collapsed, the factory diversified into food supplements and seaweed-based cosmetics.

The factory now produces cosmetic masks, creams and shampoos. Though the products enjoy a local following, they are virtually unknown beyond the region. Visitors stock up on creams, face masks and bath salts, because finding them elsewhere is next to impossible.

The company claims that other, more expensive products, do not compare with the Solovetsky seaweed.

Melanoma Target Cancer Therapy

A common goal of physicians treating cancer is to maximally damage the cancerous cells while minimizing the damage to healthy tissues. For a number of years radio-biologists from the **Joint Institute for Nuclear Research (JINR, Dubna, www.jinr.ru)** in collaboration with radio-chemists have been developing their *target cancer therapy method*. This treatment method uses specific carriers that selectively bind with cancerous cells and deliver to them agents that damage the cancerous cells.

JINR scientists have identified an agent that selectively binds with structures that are part of melanoma cancerous cells. This carrier is used as the base for developing a method for gold nanocluster delivery. It was shown that, under the action of certain UHF emitters of a high peak power, gold nanoparticles destroy cancerous cells.

Stomach Cancer Diagnosis

Russian physicians are using *Helicobacter pylori* as biological sensor for diagnosing malignant stomach tumors.

These bacteria are known to be responsible for developing gastric ulcer and stomach cancer. In Russia, on an annual basis, about 40 people in 100 thousand receive this diagnosis.

Like other cancers, early detection of tumor formation is one of main aspects of successful therapy. However, existing methods for stomach cancer diagnostics cannot provide reliable and exact tumor detection. Russian researchers seem to have found a solution. Stomach cancer has one peculiar feature – tumor cells are unable to produce hydrochloric acid, thus the tumor environment becomes alkalized. Accordingly, gastric juice can signal malignant growth.

Russian scientists discovered genes of acid stress, activity of which varies, when environmental pH changes. Moreover, expression of these genes also depends on tumor growth, which is extremely important for early diagnostics. When promoters of these genes were

joined with genes of fluorescent proteins, the result was a molecular construction, which became the basis for the biosensor.

To use microorganisms as a signal device, further development is needed. Learning to synchronize activity of cells in culture is required. Further, researchers need to understand how to interpret expression of bacterial genes: *Helicobacter pylori* has between 79 and 120 genes, working in response to environment acidification.

Physics

Cold plasma for biologically harmful admixes

A method to produce a non-thermal plasma at atmospheric pressure, created directly in liquids, gases or on the surface to be treated, has been developed. On non-thermal plasma's application a wide spectrum of ecologically safe particles are produced. These particles destroy biologically dangerous pollutants, both pathogenic microorganisms and chemical toxicants. The ecologically safe particles include free radicals O and OH, excited molecules of nitrogen and oxygen, ozone, ultraviolet radiation *etc*

There is a problem created by biofilms influence on industrial materials. Microorganisms constituting biofilms are known to be highly tolerant to conventional sterilization procedures. Protecting industrial materials, equipment, electronic devices, military and space equipment from damage and corrosion initiated by microorganisms is solved using this technology.

With the increasing danger of biological and chemical terrorism methods are needed for effective clean up after an attack. Thermal and chemical decontamination methods for a building's interior may cause considerable damage. Decontamination methods for polluted water are slow and expensive. This technology rapidly and ecologically treats these interiors and water polluted with biological and chemical agents.

Now, cold plasma treatment at atmospheric pressure is not widely used in practice. To this point use has been use has been limited because scaling developed sources of cold plasma to parameters convenient to consumers is technically complicated and expensive. Also, current plasma production methods do not prevent local disruptions in the place of contact of high intensive streamers and the surface to be treated.

Two new production methods for atmospheric pressure of cold plasma have been developed. These methods are original, simple in implementation, easy scalable and effective in their action on treated objects.

Both cold plasma production procedures were tested in laboratory conditions. Complex microbiological objects were used in the tests and the results were positive. Scientists from TRINITI and SRCAM

have conducted preliminary experiments and demonstrated that both these procedures are useful to develop up-to-date delicate efficient sterilization methods.

High speed flow burns

Russian scientists developed a solution for utilizing and processing low-grade fuels, super-toxins, pesticides, oil and chemical industry waste and associated petroleum gas.

The principle underlying the technology is burning all these in high-speed flows. Researchers developed a compact unit for this purpose. The unit is small, mobile and work very fast.

The unit's 12-cm rocket engine shows better results than ordinary two-circuit and rotary ovens, processing up to 1.5 tons of dioxins, production wastes, associated gases and other dangerous substances per one hour.

Burning products are simple harmless substances in liquid or solid form, e.g. sodium chloride – table salt – solution

Automobile Air Conditioners

OOO *Avtokomfort* (Moscow) has developed a new design for automobile air conditioners. The new air conditioner design uses ambient air as a coolant. The technology is protected by a patent RU №2280566 and a PCT application. A prototype sample has been produced and tested.

This air conditioner is based on a vortex tube. Its advantages follow:

1. Ecology. Using ambient air as a coolant produces no greenhouse effect.
2. The air conditioner's operating costs are minimal; it requires no additional equipment for producing the coolant, its refueling, discharge and regeneration.
3. The air conditioner design requires the vehicle to have an ICE supercharger. The supercharger's excess power is used. Specifically, it makes use of the 2.1 bar exhaust air as a coolant. This feature provides for additional without increasing fuel consumption. The air conditioner's small dimensions make it possible for it to be built it into the existing car ventilation system.

The air conditioner's price (including installation) is about US$300.