GS-1402-005
100 YEARS OF DRINKING WATER REGULATION. RETROSPECTIVE REVIEW, CURRENT SITUATION AND PROSPECTS.
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Abstracts. There is considered the history of the development of legislative requirements to the regulation of the quality of drinking water in different countries and international organizations during the period from 1912 to the present time. In terms of comparative analysis there is analyzed the current state of regulatory frameworks of the Russian Federation, WHO, EU, Finland, the UK, Singapore, Australia, Japan, China, Nigeria, the United States and Canada in the field of providing favorable conditions of population drinking water use. There has been noted the significant progress in standardization of the content of the biogenic elements and chemical pollution of drinking water in the absence of uniform requirements to the composition and properties of drinking water globally, that is bound to the need to take into account the national peculiarities of drinking water supply within the separate countries. As promising directions for improving regulation of drinking water quality there are noted: the development of new standards for prioritized water pollution, periodic review of standards after appearance of the new scientific data on the biological action of substances, the use of the concept of risk, the harmonization of the normative values and the assessment of the possibility of introduction into the practice the one more criterion of profitableness of population water use – the bioenergetic state of the water

Key words: drinking water, hygiene standards, regulatory frameworks of international organizations and separate countries in the field of the regulation of the quality of drinking water

GS-1402-018
MIGRATION OF INDUSTRIAL RADIONUCLIDES IN SOILS AND BENTHAL DEPOSITS AT THE COASTAL MARGINS OF THE TEMPORARY WASTE STORAGE FACILITY (TWSF) OF THE NORTHWEST CENTER FOR RADIOACTIVE WASTE MANAGEMENT «SEVRAO» AND ITS INFLUENCE ON THE POSSIBLE CONTAMINATION OF THE SEA OFFSHORE WATERS
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Abstracts. For obtaining the integral information about the current radiation situation in the sea offshore waters of the temporary waste storage facility (TWSF) of the Northwest Center for Radioactive Waste Management «SevRAO» in the Andreeva Bay and in the settle Gremikha with a purpose of a comprehensive assessment of its condition there was performed radiation-ecological monitoring of the adjacent sea offshore waters of the TWSF. It was shown that in the territory of industrial sites of the TWSF as a result of industrial activity there are localized areas of pollution by man-made radionuclides. As a result of leaching of radionuclides by tidal stream, snowmelt and rainwater radioactive contamination extends beyond the territory of the sanitary protection zone and to the coastal sea offshore waters.

To confirm the coastal pollution of the sea offshore waters the levels of mobility of 90Sr and 137Cs in environmental chains and bond strength of them with the soil and benthal deposits were clarified by determining with the method of detection of the forms of the presence of radionuclides in these media. There was established a high mobility of 137Cs and 90Sr in soils and benthal deposits (desorption coefficient (Kd) of 137Cs and 90Sr (in soils - 0.56 and 0.98), in the sediments - 0.82). The migration of radionuclides in environmental chains can lead to the contamination of the environment, including the sea offshore waters.

Key words: contamination, samples of the objects of the environment, the coefficient of desorption.

GS-1402-023
CHARACTERISTICS OF REGULATORY SYSTEM IN CHILDREN EXPOSED TO THE ENVIRONMENTAL CHEMICAL FACTORS
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Abstracts. In children residing in areas with a high content of a number of aromatic hydrocarbons in ambient air and organochlorine compounds in drinking water, there were studied the blood levels of these compounds, as well as the assessment of the indices of the immune and neuroendocrine systems was performed. The higher blood content of phenol and formaldehyde has been established and there was identified an array of organochlorine and aromatic compounds not detected in the control group children. In the blood of the children of a study group there was found an imbalance of indices of cellular components of innate and adaptive immunity, pro- and anti-inflammatory cytokines, as well as increased concentrations of free thyroxine and serotonin in the blood serum, which indicates to a change in the functions of regulatory systems in children exposed to organochlorine and aromatic compounds.

Key words: chemical environmental factors, the immune system, the endocrine system
HEAVY METALS AS A FACTOR OF POSSIBLE ENVIRONMENTALLY CAUSED ILLNESSES IN THE ASTRAKHAN REGION

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Abstracts. There are presented data about heavy metals as pollutants of the environment and the factors of environment-related diseases. There is given the brief information about the appearance of heavy metals in the environmental objects and the possible occurrence of diseases caused by trace elements deficiency in the region. There are discussed difficulties of the clinical and laboratory diagnosis, associated with general symptoms of many diseases and lack in the medical facilities the equipment for objective detection of heavy metals in human biosubstrates.

Key words: heavy metals, diseases caused by trace elements deficiency, environment-related diseases.

IMMUNOLOGICAL METHODS FOR ASSESSING HEALTH IN EXPOSURE TO AMBIENT AIR POLLUTION

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Abstracts. In the article there have been analyzed the materials obtained in the study of human health state on the results of the study of immunological status. It was shown that the In mass hygienic studies the detection of the state of the human immune system has been shown to be the one of the most promising methods for the determination of human health state, as the immune system is the most vulnerable and feels the changes in the environment. At the same time it was pointed out that the non-invasive method for determining the human immunity is the most accessible.

Key words: ambient air, pollution, human health, immunity immune status.

CLINICAL AND HYGIENIC SUBSTANTIATION OF INDIVIDUAL BIOCORRECTION FOR ECOLOGICALLY DEPENDENT CONDITIONS IN THE CRITICAL GROUPS OF THE POPULATION OF UKRAINIAN INDUSTRIAL AREAS

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Abstracts. In the article there is considered the problem of pollution of the environment and human body with heavy metals, the effectiveness of individual biocorrection in critical groups of the population - pregnant women and children residing in technologically contaminated areas. In spite of the correspondence of the content of abiotic heavy metals to their MACs in the environment, the concentration of lead and cadmium in the internal environment of the organism in 1,6-15,4 times was found to exceed physiological norms that accompanied by a significant deficiency of essential trace elements. Similar situation has been proved to lead to a reduction in mental health and ability to learn in children, as well as to the various complications in pregnancy.

The obtained results served as the scientific substantiation of the feasibility of biocorrection of the trace element imbalance ecological dependent states in the population of the industrial region. The proved high clinical effectiveness of this hygienic biocorrection is a scientific justification for widespread introduction of pectin preparations for health promotion, prevention of ecologically dependent states and increasing the adaptive capacity of the organism.

Key words: heavy metals, biomonitoring, ecologically dependent states, biocorrection.

CALCULATION OF PROGNOSES OF LUNG CANCER IN MALES FROM TECHNOGENIC CONTAMINATION OF ATMOSPHERE IN THE KEMEROVO REGION

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Abstracts. In this paper there are described the variants of the models of the regression analysis (linear, exponential, exponential and hyperbolic) for the detection of relationships between the lung cancer rate in the male population and anthropogenic emissions in the Kemerovo region. After analyzing of each model there was chosen the one seemed to be the most adequate to describe the dependence of cancer incidence from pollutant emissions into the atmosphere. At a later stage this model has served for the calculation of the
medium-term forecasting of lung cancer rate in males in the dependence on the actual number of man-made emissions in previous years.

**Key words:** lung cancer, emissions, regression analysis, forecasting incidence

**GS-1402-041**
THE APPLICATION OF THE MULTIDIMENSIONAL STATISTICAL METHODS IN THE EVALUATION OF THE INFLUENCE OF ATMOSPHERIC POLLUTION ON THE POPULATION’S HEALTH

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**Abstracts.** The search and measurement of causal relationships between exposure to air pollution and health state of the population is based on the system analysis and risk assessment to improve the quality of research. With this purpose there is applied the modern statistical analysis with the use of criteria of independence, principal component analysis and discriminate function analysis. As a result of analysis out of all atmospheric pollutants there were separated four main components: for diseases of the circulatory system main principal component is implied with concentrations of suspended solids, nitrogen dioxide, carbon monoxide, hydrogen fluoride, for the respiratory diseases the main c principal component is closely associated with suspended solids, sulfur dioxide and nitrogen dioxide, charcoal black. The discriminant function was shown to be used as a measure of the level of air pollution.

**Key words:** air pollution, the risk to human health; multidimensional statistical analysis

**GS-1402-044**
HYGIENIC ASSESSMENT OF THE RADIATION RISK OF RADON EMANATION IN THE ALTAI KRAI

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**Abstracts.** The unique climatic and geographical location of the Altai Krai determines the specific radiation dose load for the population, which is composed of the complex of radiological indices, the structure of which is largely dependent on the type of locality and, to a greater extent due to the action of radon, which is currently the main source of internal radiation of the population of upland districts and adjacent territories. There was performed a hygienic assessment of the radiation risk and the expected decline in life expectancy and population health due to radon exposure in the model areas of the Altai Krai. To calculate the additional risk there were used some models for radiation risk extrapolation: a risk constant model, model GSF (Jacobi’s model), Lubin model (TSE/AGE/WL) and BEIR VI model for smoking and nonsmoking population, as well as the combined model. The lowest values of the radiation risk and the expected decline in life expectancy are typical for Charyshsko-Ust-Kalmanskaya zone, the maximum - for Kuryinsko-Pospelikhinskaya zone.

**Key words:** natural radionuclides, radon, risk assessment, lung cancer

**GS-1402-048**
HYGIENIC ASPECTS OF THE WORKING CONDITIONS ASSESSMENT AND STATE OF HEALTH OF THE WORKERS OF THE RAILWAY DEPARTMENTAL SECURITY FORCES

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**Abstracts.** There were performed a comprehensive hygienic evaluation of the working conditions of employment and analysis of morbidity with temporary disability (MTD) of the workers of the railway departmental security forces. There was proved a significant influence of accumulated period of work on MTD. The professional causality as of the respiratory diseases in shooters and dog handlers, as of diseases of the circulatory system in the administrative and managerial workers has been established.

**Key words:** railway departmental security forces, working conditions, state of health

**GS-1402-050**
ELEMENTAL STATUS OF THE MEDICAL PERSONNEL OF THE EMERGENCY MEDICAL SERVICES IN THE CITY OF KHANTY-MANSIYSK

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**Abstracts.** Spectrometric analysis of hair from 110 medical workers (54 – from the Emergency medical services and 56 – from polyclinics) was performed with the use of atomic emission spectrometry and mass
spectrometry, inductively coupled argon plasma spectrometry (AES-ISP) methods. There were revealed features of the elemental status of the medical personnel of the Emergency medical services: a deficiency of Mg, K and Li was typical for this group (presented more then in half of cases).

**Key words:** hair, elemental markers, medical staff of the first aid moving brigades.

**GS-1402-055**

**DEVELOPMENT OF RECOMMENDATIONS FOR LEGISLATION’S HARMONIZATION OF EURASEC MEMBER STATES IN THE FIELD OF CHILDREN’S HEALTHCARE RIGHTS IN EDUCATIONAL INSTITUTIONS OF VARIOUS TYPES**

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**Abstracts.** In the paper there are presented the main results of the performed study on comparative legal analysis of national legislative acts in the field of providing of children’s rights for health care in institutions of various types for the delivery of recommendations for harmonization of legislation of States - members of the Eurasian Economic Community.

**Key words:** organization of education; health care; tes - members of the Eurasian Economic Community.

**GS-1402-060**

**HYGIENIC ASPECTS OF CELLULAR COMMUNICATION IN SCHOOL AGE**

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**Abstracts.** In the article there are presented the materials of research on the spread and usage of mobile phones among children and adolescents of different age groups in the Russian regions, the data of the performed tests of cellular communication devices, as well as the established effects of electromagnetic radiation (EMR) on biological objects. Risk groups of schoolchildren for adverse effect of EMR on health have been determined.

**Key words:** health of schoolchildren; mobile phones; electromagnetic radiation.

**GS-1402-065**

**MODERN APPROACHES TO THE PRIMARY PREVENTION OF THE DEVELOPMENT OF PSYCHOACTIVE SUBSTANCE DEPENDENCE ON THE BASE OF ACCOUNTING OF ENVIRONMENTAL AND GENETIC RISK FACTORS**


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**Abstracts.** In the work there was performed an assessment of the interaction of microsocial and genetic factors of the development of psychoactive substance (PS) dependence. The objects of the psycho-hygienic and molecular-genetic studies were 538 male patients from the specialized diagnostic and treatment center at the age from 17 to 65 years with a diagnosis of “PS dependence” according to F10-F19 in the ICD-10. There were determined personality predictors of early (before 25 years) manifestation of systematic abuse, such as low self-control, individualistic, authoritarianism, unjustified optimism and reduced capacity for social adaptation. Manifestation of the PS dependence at an early age (25 years) is determined by the contribution of genotype 9R+ DAT gene in the combination with other predisposing genotypes A1+ DRD2/ANKK1, SS SERT and 7R+ DRD. The risk of development of PS dependence at a more younger age increases with the superimposition of individual predisposing genotypes ranging from 1,2 (7R+ gene DRD4) to 1,9 (A1 + gene DRD2/ANKK10 on a destructive milieu. Pairwise combinations of genotypes 7R+ DRD4 × A1+ DRD2, 7R+ DRD4 × 9R+ DAT, 9R+ DAT × A1+ DRD2, 9R+ DAT × SS SERT significantly increase the risk by 2 or more times (2.5-2.8). There was suggested an algorithm for the prenosological forecast of the development of PS dependence in adolescents and young men.

**Key words:** substances; dependence; genetic and environmental risk factors; molecular genetic analysis; prevention.

**GS-1402-70**

**ECOLOGICALLY-DEPENDENT VITAMIN - MINERALS INSUFFICIENCY IN THE SPORTSMEN'S ORGANISM**


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**Abstracts.** The authors revealed the reduction of saturation of iron, copper, zinc, E and B2 vitamins in sportmen's organism under high physical exercise. The negative effect was associated with the duration of
training – competition cycles. The reduced vitamin-mineral saturation of the organism was associated with the low ferritin level and an imbalance in the hormonal regulation of erythropoiesis. The state of erythropoiesis can be a criterion performance of athletes, whereas a degree of saturation of the body with minerals and vitamins can be the criterion for prenosological diagnosis of their health and professional relevance.

**Key words:** athletes; exercise; performance; criteria.

**GS-1402-073**  
**THE REGIONAL FACTORS DETERMINING THE FORMATION OF CHILDHOOD DISABILITY IN THE ALTAI KRAI**  
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**Abstracts.** Disability is one of the main indices of public health of the population. Disability rates indices for children can be applied in the study of public health of population and for determination of the influence of the array of the healthpromoting factors. As a result of the performed studies it is possible to consider some regional regularities for the formation of childhood disability and the role of a number of factors in its formation.  

**Key words:** childhood disability; main pathologies of risk; regions – leaders for common disability in children; statistical and correlation analyzes.

**GS-1402-076**  
**GENOTOXICITY EVALUATION OF NANOPARTICLES**  
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**Abstracts.** There are considered the results of studies of genotoxicity of nanoparticles with an emphasis on studies in vivo. Oxidative stress was determined as a general mechanism genotoxicity of nanoparticles defined. There are reported the practical considerations relating to the genotoxic assessment of nanoparticles. In particular, there was pointed out the priority of research in vivo, there was indicated to a possible dependence of the manifestation of effects as well on the properties of nanoparticles, as the timing of exposure, dose, route of administration, the peculiarities of the sample preparation. There was noted the desirability of the usage of positive controls in experiments. As tasks requiring solutions, there were separated the assessment of the ability of nanoparticles to the induction of gene mutations and evaluation of their genotoxic effects in embryonic and germ cells. There was given a conclusion on the general state of the problem and there were identified the priorities of research in genotoxicology of nanoparticles.  

**Key words:** nanoparticles; genotoxicity.

**GS-1402-084**  
**BIOLOGICAL TESTING OF WATER WITH DIFFERENT STRUCTURAL STATES IN RATS AND FROGS**  
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**Abstracts.** The effect of water samples with different structural states on some physiological indices of white laboratory rats, 5 groups of 10 animals (5 females and 5 males) and frogs has been studied. The investigation was performed for 1 month. For the determination of the content of liquid crystal associates (LCA) in water samples there was used the dilatometric method, the performance of experimental animals was studied by the swimming test (up to total fatigue).  

The performed experiment on growing rats with the use of water with varying degrees of structuredness showed that according to the weight gain there were optimal water “Lekor” and tap water, treated with Bioptron (the content of the structured fraction is 5,06 ± 0,09% and 6,9 ± 0,23 %, respectively). On physical performance the best indices were in animals consumed water treated with the Bioptron lamp.  

In performance of experiments on frogs it was found that cardiac function in animals under experimental conditions over time weakens spontaneously: heart rate and cardiac output decline. Therefore, the effect of different water samples on the cardiac function was assessed on the intensity of its decrease for 15 minutes. In the experimental study of the effect of water with different content of LCA on heart rate and cardiac output of the frog it was found that the optimum level of structuredness of water is within the range of 5,06 ± 0,09% (in water “Lekor”) - 6,9 ± 0,23% (tap water treated with Bioptron). All the other water samples, the content of nanocrystals in which was below or above this range, has a pronounced inhibitory effect on the heart performance of the frog.  

**Key words:** condition; performance of experimental animals; the cardiac activity of rate and cardiac output.
THE EFFECT OF TREATMENT OF CHRYSOTILE WITH CHLORIDE IRON (III) ON THE EFFECT OF GENOMIC INSTABILITY IN CULTURED HUMAN LYMPHOCYTES

Ingel F.I., Pylev L.N., Yurtseva N.A., Krivtsova E.K., Smirnova O.V., Golubeva N.M.

Abstracts. All forms of asbestos are carcinogenic to humans, that caused the prohibition of its use in Europe, America, etc. However, the unique physical and chemical properties of asbestos and many opportunities for its applications in various industries and human activities require the creation of new technologies to analyze genomic instability in human lymphocytes in a large range of doses (micronucleus test with cytochalasin B showed a decline of core indicators of genome instability (frequency of dividing cells with cytogenetic damage, asymmetry in the distribution of the genetic material in mitosis, proliferative activity) incubation of cells with asbestos modified chloride iron, as compared to the initial sample. These data are consistent with the results of analysis of the intensity of neutrophil chemiluminescence of luminol by exposure of human blood samples studied. Based on the findings made some practical recommendations to the protocol cytogenetic analysis of genomic instability of people exposed to asbestos.

Key words: asbestos; asbestos, treated with ferric chloride (III); culture of human blood; micronucleus test with cytochalasin B, genomic instability.

HEADSPACE ANALYSIS OF VOLATILE ORGANIC COMPOUNDS (VOC) IN DRINKING WATER BY THE METHOD OF GAS CHROMATOGRAPHY


Abstracts. In the paper there is presented a methodology of analysis of headspace 52 volatile organic compounds in drinking water by the method of gas chromatography with the use of the chromatograph “Crystal 5000.2” with three detectors and automatic attachment Lab Hut 200N NT-200 for the preparation of the sample water and vapor phase input. The lower limit of detection for all compounds in the 2-10 times lower than that of the corresponding standard value.

Key words: gas chromatography; static headspace; volatile compounds.

CHRYSOTILE-ASBESTOS INDUCES CYTOGENETIC EFFECTS IN THE RAT’S MESOTHELIUM in vitro AND in vivo

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Abstracts. Under cultivation of rat peritoneal mesothelial cells in vitro in them there are appeared signs of the genomic instability, evidencing their transformation: increasing of the number of both binucleated cells with micronuclei and poly-nuclear cells and the increase of sizes and polymorphism. Asbestos greatly accelerates this process. Asbestos-induced carcinogenesis in vivo is accompanied in pleural mesothelium in the rats there also revealed with similar signs of genomic instability and cellular transformation.

Key words: genomic instability, asbestos, asbestos-induced carcinogenesis, pleural mesothelium, rats.

METHODICAL APPROACHES TO EVALUATION OF AIR POLLUTION BY EMISSIONS OF MOTOR VEHICLES IN POPULATION AREAS

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Abstracts. There are results of comparative analysis of air pollution by emissions of motor vehicles in the residential districts of Ryazan via different methodical approaches. Emissions were calculated regarding analysis of the traffic intensity on the elements of the city traffic network. Relative emissions, equivalent
relative emissions and relative coefficient of emission hazard were calculated for each district. Rating of the comparing districts was done according to the pollution level using the above-mentioned indices. Gorodskaya Roscha was detected as the most polluted district. The most informative approach was comparison of the residential districts according to the equivalent relative emissions and relative coefficient of emission hazard.

**Key words:** emissions; pollutants; motor vehicles; the atmospheric air; methodical approaches.