

## Russian regional scientists project proposals for participation in FP7

### THEME 2: Food, Agriculture and Fisheries, and Biotechnology

#### FP7-KBBE-2010-4

#### 2.1. SUSTAINABLE PRODUCTION AND MANAGEMENT OF BIOLOGICAL RESOURCES FROM LAND, FOREST AND AQUATIC ENVIRONMENTS

#### 2.2. FORK TO FARM: FOOD (INCLUDING SEAFOOD), HEALTH AND WELL BEING

#### 2.3. LIFE SCIENCES, BIOTECHNOLOGY AND BIOCHEMISTRY FOR SUSTAINABLE NON-FOOD PRODUCTS AND PROCE

#### **1. Prof. Tamara A. Kovaleva, DSc**

Biological faculty / biophysics and biotechnology;  
Nanoscopy and nanotechnology laboratory  
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*Is interested in participation in a project that will be prepared and submitted in the following topics:*

***KBBE.2010.3.3-01: Robust and novel biocatalysts for industrial applications***

***Novel marine bioactive compounds for European industries***

***The atomic-force microscopy and others biophysical nanotechnologies in research of structurally functional properties of hydrolases***

**Call identifier: FP7-KBBE-2010-4**

#### **Expertise:**

The spatial structure of various hydrolases was investigated by methods of atomno-force microscopy, computer modelling, gel-chromatography, electrophoresis, IR-spectroscopy. Physical and chemical properties of enzyme preparations and kinetiko-thermodynamic aspects of hydrolysis reaction to polymeric substrate was studied.

Problems to be solved and results:

Working out of structurally functional models of imulinase, lipase, glucoamylase and also creation on their basis of heterogeneous biocatalysts to the prolonged action is planned.

#### **Publications on the topic:**

- ✓ Computer\_Aided Analysis of Spatial Structure of Some Hydrolytic Enzymes // V.G. Artyukhov, T.A. Kovaleva, O.M. Kozhokina, L.A. Bitutskaya, R.V. Dronov, O.D. Trofimova. – Biochemistryю – 2005. - Vol. 70, № 10, 2005. – P. 1086-1094.
- ✓ Kinetic and thermodynamic aspects of polysaccharide hydrolysis by native and immobilized amylases // T.A. Kovaleva – Biophysics. – 2000. – Vol. 45, № 3. – P. 427-432.
- ✓ Influence of urea,  $\gamma$ - and UV-radiation on physicochemical properties of the native and immobilized inulinase // T.A. Kovaleva, O.M. Kozhokina, O.D. Trofimova. – Radibiology. Radioecology. – 2000. – Vol. 40, №1. - C. 23-27.
- ✓ Evaluation of the Number of Ionogenic Groups of Inulinase by Acid-Base Titration // T.A. Kovaleva, M.G. Holyavka, S.G. Rezvan, S.V. Kozhedub. - Bulletin of Experimental Biology and Medicine. – 2008. - Vol. 145, №. 6. P. 718-720.
- ✓ Influence of UV irradiation on physicochemikal properties of immobilized inulinase Aspergillus awomari // O.D. Trofimova, O.M. Kozhokina, A.S. Taha - 8th IUBMB Conference. –Boston. - 2004. - p. 17
- ✓ Investigation of kinetik and thermodynamic aspects of polymeric substrate hydrolysis by soluble and immobilization hydrolase // V.G. Artyukhov, T.A. Kovaleva, O.D. Trofimova, O.M. Kozhokina, A.S. Taha - Al-Mustansiria Journal of Science. - 2004. - №6. – P. 183-188.

<http://www.ric.vsu.ru>

- ✓ Development of the heterogeneous biocatalyst for reaction of inulin hydrolysis on basis of immobilized inulinase preparation from *Kluyveromyces marxianus* // T.A. Kovaleva, M.G. Holyavka, A.S. Taha – Biotechnology [in Russian]. – 2007. - № 3. - C. 80-87.

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*Is interested in participation in a project that will be prepared and submitted in the following topics:*

***KBBE.2010.3.3-01: Robust and novel biocatalysts for industrial applications***

***Novel marine bioactive compounds for European industries***

***Development of the heterogeneous biocatalyst for fructose production on the bases of vegetative insulin containing material***

**Call identifier: FP7-KBBE-2010-4**

### Expertise:

It is realized immobilization of enzyme inulinase on different supports. Using the methods of gel-chromatography, electrophoresis, infrared spectroscopy, atomic force microscopy and computer modeling it is established the spatial structure of inulinase. It is investigated physicochemical properties and kinetic-thermodynamic aspects for hydrolytical reaction of fructose containing polymer substrates.

Problems to be solved and results:

It is planed to forget structure-functional inulinase models and creating on this bases heterogeneous biocatalysts in tubular reactor systems for fructose production from vegetative material.

### Publications on the topic:

- ✓ Kinetic and thermodynamic aspects of polysaccharide hydrolysis by native and immobilized amylases // T.A. Kovaleva – Biophysics. – 2000. – Vol. 45, № 3. – P. 427-432.
- ✓ Spatial structure computer analysis of hydrolytic enzymes // V.G. Artyukhov, T.A. Kovaleva, O.M. Kozhokina, L.A. Bitutskaya, R.V. Dronov, O.D. Trofimova – Biochemistry. – 2005. – Vol. 70, № 10. – P. 1318-1327.
- ✓ Development of the heterogeneous biocatalyst for reaction of inulin hydrolysis on basis of immobilized inulinase preparation from *Kluyveromyces marxianus* // T.A. Kovaleva, M.G. Holyavka, A.S. Taha – Biotechnology. – 2007. - № 3. - C. 80-87.
- ✓ Influence of urea,  $\gamma$ - and UV-radiation on physicochemical properties of the native and immobilized inulinase // T.A. Kovaleva, O.M. Kozhokina, O.D. Trofimova. – Radibiology. Radioecology. – 2000. - T. 40, №1. - C. 23-27.
- ✓ Influence of UV irradiation on physicochemical properties of immobilized inulinase *Aspergillus awamori* // T.A. Kovaleva, O.D. Trofimova, O.M. Kozhokina, A.S. Taha - 8th IUBMB Conference. – Boston. - 2004. - p. 17.
- ✓ Investigation of kinetik and thermodynamic aspects of polymeric substrate hyrolisis by soluble and immobilization hydrolase // V.G. Artyukhov, T.A. Kovaleva, O.D. Trofimova, O.M. Kozhokina, A.S. Taha - Al-Mustansiria Journal of Science. - 2004. - №6. – P. 183-188.

## 3. Dr. Lidia A. Miroshnichenko, PhD

Head of the Ltd company

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*Is interested in participation in a project that will be prepared and submitted in the following topics:*

***KBBE.2010.2.2-02 Diet and prevention of functional decline of the elderly***

***KBBE.2010.2.1-01 Determinants of food choice and eating habits***

**Call identifier: FP7-KBBE-2010-4**

**Short description of the organization:**

Russkaya Oliva Ltd. (Russian Olive) is a private company focused on research, development and sale of dietary oils in the Russian Federation and Europe. Our company's professional team is experienced to work with European colleagues and partners and ready to participate in the current program together with European partners. Our team of 7 includes health care professionals, research and development experts in dietary products. The most significant experience and achievement of our team is conducting research and clinical trials of amaranth oil for prophylactic treatment of cardio-vascular diseases, diabetes and gum disease together with Russian clinical centers and international experts. List of references is presented in the partnership proposal.

**Expertise:**

Russkaya Oliva Ltd. proposes to establish and conduct research of Amaranth oil diet for prophylactic treatment of functional disorders of elderly people. In other words, we would like to study how regular administration of amaranth oil diet will improve quality of life of elderly population worldwide.

We have developed a unique technology of amaranth oil production from Amaranth. Our amaranth oil is an excellent source for omega series fatty acids, tocopherol (Vitamin E) and squalene.

Our company proposes potential partners to organize and conduct clinical trials to study efficacy of Amaranth oil-containing diet for prophylactic treatment of cardio-vascular diseases, or oncology diseases, or diabetes, or immunological disorders.

We propose to conduct GCP clinical trials in large cities of the Russian Federation (with population > 1 mln) where clinical experts- dietitians already work with our company as well as in a country(ies) of the European Union.

Russian GCP clinical trials will be conducted in clinical centers such as centers of health prophylactic, policlinics, hospitals and other medical organizations.

For the current proposal for collaboration, we plan to provide:

1. Preparation, organization, CTA approval, initiation and management of GCP clinical trials to study efficacy and safety of amaranth oil-containing diet
2. Delivery of dietary products containing amaranth oil
3. GCP clinical trials monitoring and audit of selected clinical centers
4. Clinical trials approval and work with regulatory agencies
5. Evaluation, statistical analysis of results of clinical trials, report preparation in order to get approval of a clinical indication from regulatory agencies.

In order to accomplish goals of the current proposal, we hope to collaborate with companies and organizations studying similar dietary oils.

**Publications on the topic:**

- ✓ Miroshnichenko L.A., Zharkova I.M., Kulakova S.N., Kadirov C.V., Eprintsev A.T., Kalinicheva M.V. Amaranth: A Few Aspects of Cultivation, Processing, Studies of Pharmaceutical Properties. In Conference Proceeding Book: Functional Foods for Cardiovascular Diseases. Dallas. D& A Inc. (2005): 228-234.
- ✓ Pogojeva A.V., Gonor K.V., Kulakova S.N., Miroshnichenko L.A., Martirosyan D.M. Effect of Amaranth Oil on Lipid Profile of Patients with Cardiovascular Diseases. In book Functional Foods for Chronic Diseases, 2006, Pp 35-45.
- ✓ Danik.M. Martirosyan, Lidia A Miroshnichenko, Svetlana N Kulakova, Ala V Pogojeva, Vladimir I Zolodov. Amaranth oil application for coronary heart disease and hypertension. Lipids in Health and Disease 2007, 6:1. I

<http://www.ric.vsu.ru>

- ✓ Danik M. Martirosyan, Lidia A. Miroshnichenko, Vladimir I. Zoloedov. Ala V. Pogojeva, Svetlana N. Kulakova, Amaranth Oil Application for Coronary Heart Disease, Agro Food Industry, Hi-Tech. Accepted for 2007 May/June issue.
- ✓ D.M. Martirosyan and L.A. Miroshnichenko. Amaranth Oil for Cardiovascular Disease. Natural Products insider, 2007, 1, January 15.
- ✓ V Pogojeva, K.V.Gonor, L. A Miroshnichenko, I.M Zharkova, F.A.Medvedev, S.N. Kulakova. Using amaranth oil in dietetics in patients with ischemic illness of heart and with hyperlipoprotendemia. International Congress Hannover, 2004, P 19.
- ✓ V.I.Zoloedov, Miroshnichenko L.A., Zharkova I.M.. The efficiency of diet therapy of type 2 diabetes due to cold extracted sunflower oil. International Congress Hannover, 2006. P.88-89.

#### **4. Prof. Ninel E. Pavlovskaya, DSc**

Orel Regional Centre of Agricultural Biotechnology

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*Is interested in participation in a project that will be prepared and submitted in the following topics:*  
**Biotechnological conversion of agricultural production wastes**

**Call identifier: FP7-KBBE-2010-4**

#### **Short description of the organization:**

Orel State Agrarian University was founded in 1975. Now the University is a large, dynamically developing Research and Cultural Centre of the Central regions of Non-Black zone, which includes 5 faculties: agro business and ecology, biotechnology and veterinary medicine, economic, agro techniques and energy supply, etc. Orel State Agrarian University became a winner of the Innovation Education program "Development of the transfer regional system of the innovation technologies in animal husbandry". In the Orel regional centre of the agricultural biotechnology that was created in 2001 on the money being received from grant of Science Ministry of the Russian Federation. 20 persons work in the center, among them 2 Doctors of Sciences, 17 Candidates of Sciences, more than 100 scientific works are published, including 5 study books, 5 monographs. The work of the scientific school is carried out in several directions: "Biotechnological processing of agricultural and industrial wastes"; "Extraction of biological active components and their testing as ecologically safe means of plant protection"; "Production of Biological Active Additives (BAA) for food and forage industry".

#### **Proposal/Expertise:**

The amount of annual waste in the Orel region is characterized by the rate of 1.5 ml. tons, including: organic waste of the processing enterprises – 55%; hard garbage, waste of treatment facilities – 20%; iron-and-steel and color scrap, alumina containing slags and ferrous waste of Orel Steel Rolling Plant – 18%; others – 7%. In general in the region the total accumulation, accounting the wastes being buried, is evaluated in 30 ml tons. All these waste can be used for obtaining economically important production and improving ecological environment.

The Orel region has all imputations for engineering biotechnology development: large livestock complexes for 1,5 ml pigs heads, poultry industrial farms; four sugar processing plants, groats crusher, production of cereals, grain and groat legumes, supplying tons of useful waste; vast territories where it is possible to grow green raw to obtain biofuel, etc. Coprolites of domestic hybrid compost worm "Staratel" are obtained from pig, poultry compost, sewage sludges. Their physical-chemical properties are investigated, humic, fulvic and hymatomelanic acids are extracted, biological activity of biohumus on pathogenic soil micro flora and antioxidant plant activity are found, positive influence of biohumus active substances on the agronomy features of pea, wheat, potato is staed. Biopesticides on the natural components being extracted from plants and microorganisms (lectins, hydrolase inhibitors, bioflavonoids, humate, flavonoids, etc.) are created. They are able to reduce the application of chemical agents of protection and to rehabilitate environment. Biopreparations are active in concentrations approximated to nanoobjects ( $10^{-7}$ - $10^{-8}$  M).

New alternative food products, tea, tinctures, balsams, ointments, creams, dry breakfasts, antioxidant complex, including vitamins of preventive importance, forage additives and premixes are obtained from wastes of back wheat cultivation and processing.

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The wastes of the sugar processing industry (sphincter, molasses) are used to obtain pectins with bactericidal and complex forming properties, bioethanol, racemic mixtures, and bio fertilizers. Sphincter is used to get food and forage and half-finished product (dry concentrate) with high pectin content.

Further researchers will be devoted to deep investigation of coprolite active substances and antagonist mushroom *Trichoderma* that rehabilitates soil and has therapeutic effect on infection diseases treatment of a person and animals.

The industrial innovation production of alternative products of wide assignment for animal and poultry: dry concentrate made from sugar-beet sphincter, premixes and also biofuel on the basis of bioethanol from molasses and rape is supposed.

The soil reconstructing bio fertilizers that prevent pathogen agent development will be produced from dry residue of sewage by means of vermiculation. The routine application and technical production conditions will be developed.

#### **Publications on the topic (other references):**

- ✓ Andreas Blennow, Ninel E. Pavlovskaya, Alexey V. Krivandin, Vladimir P. Yuryev. Structural and Thermodynamic Properties of High – amylase Wrinkled Pea and Starch Branching Enzyme – suppressed Potato Starches/ Starch Progress in Basic and Applied Science /Piotr Tomasik, Vladimir P. Yuryev, Eric Bertoft, 2007.
- ✓ Pavlovskaya N.E., Samofalova L.A., Klimova E.V., Klimov R.V. Method of obtaining plant product "Rostok". Patent 2256378 PФ, MKI A 23 L 1/10. 1/172, Applicant and patentholder Orel State Technical University. --№2005122777/13; applic. 18.07.05; published. 10.02.07, Bulletin. №4.- p.4
- ✓ Pavlovskaya N.E., Kornienko N.N., Gagarina I.N., Miroshnikova M.P., Zelenov A.N. Formation of polypeptide composition of pea bean seed proteins in the maturation process./ Bulletin of Russian Academy of Agricultural Sciences, 2007, №3, p.39-41
- ✓ T.N. Lasareva, N.E. Pavlovskaya, I.N. Fesenko, and A.N. Fesenko. Seed Protein Polymorphism of Common Buckwheat (*Fagopyrum Esculentum* Moench.) Varieties, Revealed by SDS- PAGE Gtx/ Advances in Buckwheat Research| Proceedings of the 10 th International Symposium on Buckwheat, Chai Yan Zhang Zongwen, p.383-386
- ✓ Pavlovskaya N.E., Lasareva T.N., Fesenko I.N., Fesenko A.N. Polymorphism of Common Buckwheat revealed by electrophoresis of seed proteins. Reports of Russian Academy of Agricultural, 2007, 6, p.14-15
- ✓ Pavlovskaya N.E., Parakhin N.V., Zotikov V.I., Gagarina I.N., Gorkova I.V., Golyishkina L.V. General biotechnology (Study book) Published OrelSAU, 2007, 332 p.
- ✓ Pavlovskaya N.E., Jushkova E.I., Danilenko A.N., Botuz N.I., Polosova E.J., Borsenkova G.A. Physical-chemical characteristics and biological activity of biogumus. / Published "ORASS", Orel, 2007, 138 p.
- ✓ Pavlovskaya N.E., Golyishkin L.V., Szuk G.P., Asarova E.F., Zubareva K.J. Investigation of peculiarities of vegetable parchment layer formation of pea bean leaves as a barrier for invasion *Bruchus pisorum* L. /Storage and processing of agricultural raw, 2007, 2, p.38-41
- ✓ Pavlovskaya N.E., Piskuryeva V.A., Piskuryeva I.V. New possibility of sugar processing industry in the Orel region / Materials of I international Internet - conference, 10 March 2008. «Fundamental and Applied Researches in Agro Industrial Complex in a modern stage of chemistry development"., Orel, 2008, p.112-114
- ✓ Pavlovskaya N.E., Gagarina I.N., Miroshnikova M.P. Bean Biochemistry. / OrelSAU, 128 p.

#### **5. Prof. Ninel E. Pavlovskaya, DSc**

Orel Regional Centre of Agricultural Biotechnology

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*Is interested in participation in a project that will be prepared and submitted in the following topics:*  
**Prospecting for novel plantproduced compounds**

**Call identifier: FP7-KBBE-2010-4**

### Short description of the organization:

Orel State Agrarian University was founded in 1975. Now the University is a large, dynamically developing Research and Cultural Centre of the Central regions of Non-Black zone, which includes 5 faculties: agro business and ecology, biotechnology and veterinary medicine, economic, agro techniques and energy supply, etc. Orel State Agrarian University became a winner of the Innovation Education program "Development of the transfer regional system of the innovation technologies in animal husbandry". In the Orel regional centre of the agricultural biotechnology that was created in 2001 on the money being received from grant of Science Ministry of the Russian Federation. 20 persons work in the center, among them 2 Doctors of Sciences, 17 Candidates of Sciences, more than 100 scientific works are published, including 5 study books, 5 monographs. The work of the scientific school is carried out in several directions: "Biotechnological processing of agricultural and industrial wastes"; "Extraction of biological active components and their testing as ecologically safe means of plant protection"; "Production of Biological Active Additives (BAA) for food and forage industry".

### Proposal/Expertise:

Our scientific school works specializes in the field of biochemistry, biotechnology, ecology, veterinary medicine, the questions of identification of agricultural crops by protein and RNA-technologies, extraction of the cell components from plants and microorganisms (inhibitors, lectins, vitamins, enzymes, alkaloids, anthocyanins), their testing and application as biological means of protection and biologically active additives to food and forage. We develop resource saving technology of obtaining pectin, sugar and alcohol from sphincter of sugar processing industry. It is necessary to continue screening of highly productive sources of active components of buck wheat, bean, soybean, pea, lupin, barley, oat and other crops for their selection, cleaning, biological activity testing and wide scale introduction into food (pectins with bactericidal facilities, food ingredients with protective functions, racemic carbohydrate mixtures and etc.) and pharmaceutical industry (lectins, hydrolase inhibitors, antioxidants, pectin, rutin, bioflavonoids, antineoplastic protein SP-2, etc.), forage production (apoptosis inducers, microfertilizers, humates, coprolites, etc.), veterinary (means of animal protection from leucosis, mammitis, brucellosis, etc.), plant growing (biopesticide, bio preparations, regulators of growth and development, etc.), selection (donors with high biologically active component content) and other fields. New lines of vegetable pea with amylase more than 80% in starch are obtained, enzyme resistant properties are sated, starch grain structure is examined by X-ray diffraction analysis and DC- color comparison. New technologies of obtaining rutin, food dye, biopreparations on the base of plant lectins and microorganism lipids, forage additives and other biologically active substances are worked out. Antioxidants are extracted and cleaned, pharmaceutical and veterinary agents on the basis of cell components from mushrooms *Ascochita*, *Trichoderma* are created. Tests of new biologically safe preparations inducing disease tolerance and increasing agricultural plant productivity are carried out. Apoptosis inducers and the ways of its regulation are investigated, control of gene modified organisms are done with the method of PCR-DNC analysis.

### Publications on the topic (other references):

- ✓ Pavlovskaya N.E., Parakhin N.V., Gagarina I.N., Gorkova I.V. Development of bioeconomic approaches to vitamin production, in-vitro- diagnostics, biopesticides on the ground of active usage of biological objects/ Materials of the Fourth Moscow international congress (Moscow, 12-16 March, 2007 г.) M.: ZAO «Expo – biochim. - technologies», RKHTU under the name of D.I. Mendeleev, 2007. P.301
- ✓ Pavlovskaya N.E., Parakhin N.V., Zotikov V.I., Gagarina I.N., Gorkova I.V., Golyishkina L.V. General biotechnology (Study book) Published OrelSAU, 2007, 332 p.
- ✓ Pavlovskaya N.E., Jushkova E.I., Danilenko A.N., Botuz N.I., Polosova E.J., Borsenkova G.A. Physical-chemical characteristics and biological activity of biogumus. / Published "ORASS", Orel, 2007, 138 p.
- ✓ Pavlovskaya N.E., Nechaev L.A., Tsybakova J.N., Botuz N.I., Danilenko A.N. Characteristics of biogumus of different maturity index./ Bulletin of Russian Academy of Agricultural Sciences, 2007, №6, p.25-27.
- ✓ Pavlovskaya N.E., Prudnikova E.G., Zubareva K.J., Borsenkova G.A. Regulation of injurious pea insect population by new preparation based on lectins of wheat germ. / Materials of I international Internet - conference, 10 March 2008. «Fundamental and Applied Researches in Agro Industrial Complex in a modern stage of chemistry development», Orel, 2008, 130-133
- ✓ Pavlovskaya N.E., Gagarina I.N. Innovation approach to protein component usage in biotechnology./ Bulletin OrelSAU, 2008, №1 (10), p.36-38

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- ✓ Pavlovskaya N.E., Jushkova E.I., Danilenko A.N., Botuz N.I. Investigation of physical chemical properties of compost fulvic acids and wormy composts of different origin by method of VEZH/ Agrochemistry, 2008, №3, p.67-71
- ✓ Pavlovskaya N.E., Parakhin N.V., Gagarina I.N., Gorkova I.V. Constructional application of biological objects in technological production of preparations of bacteriostatic, antioxidant and immunomodulating effect./ International scientific-practical Conference «Biotechnology: water and food products», Moscow, Russia, 11-13 March 2008., P.143
- ✓ Pavlovskaya N.E., Gagarina I.N., Miroshnikova M.P. Bean Biochemistry. / OreLSAU, 128 p.
- ✓ Pavlovskaya N.E., Piskuryeva V.A., Piskuryeva I.V. New possibility of sugar processing industry in the Orel region / Materials of I international Internet - conference, 10 March 2008. «Fundamental and Applied Researches in Agro Industrial Complex in a modern stage of chemistry development”, Orel, 2008, p.112-114

## 6. Prof. Tatyana N. Ermolaeva, PhD

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*Is interested in participation in a project that will be prepared and submitted in the following topics:*  
*Development of new flow injection quartz crystal immunosensors for food reliability control*

**Call identifier:** FP7-KBBE-2010-4

### Expertise:

We search for partners in the field of development of new immunoanalytical technologies for express quantification of drugs, pesticides, endocrine destructors, hormones and other biological active substances in food stuffs and agricultural products. Since 1999 the science interest of Division is focused to investigation and development of QCM-sensors for diagnostics of gas and liquid media. The development of QCM immunosensors for analysis of different environmental objects and biological liquids is carried out more active. QCM sensors are developed for quantification of drugs, metabolites in biological liquids, toxic organic compounds (sulphonamides, phenols, polyaromatic carbohydrates) in environments and food stuffs, bacteria and bacteriophages in liquids.

### Problems to be solved and results:

Development of QCM sensors and multisensor systems for quantification of low concentration of pollutants, pesticides, endocrine destructors, chemical toxins and micotoxins, microorganisms in foodstuffs. Spent researches will be directed to increase productivity, sensitivity and profitability of the measurements which are carried out in a flow-injection mode. Developed devices will be tested for the further application at estimating the safety of foodstuffs, ecological objects.

### Publications on the topic:

- ✓ Ermolaeva T. N., Kalmykova E.N., Lavrenteva T.L. Quartz crystal biosensors for quantification of organic compounds in water and air // Microsyst. Technical equipment. 2001. No 9. 21-28.
- ✓ Kalmykova E.N., Ermolaeva T. N., Eremin S.A. The development of quartz crystal immunosensors for the flow-injection analysis of high- and low-molecular substances // Vestn. MGU. Ser. 2. Khim. 2002, Vol. 43. No 6. 399-403.
- ✓ Kalmykova E.N., Melikhova E.V., Dergunova E.S., Eremin S.A., Ermolaeva T.N. Kinetical researche of affine interaction and their application for development of quartz crystal immunosensors // Sorpts. khromatogr. protsessy. 2004. Vol. 4. No 5. 597-602.
- ✓ Kalmykova E.N., Milonov M.V., Melihova E.V., Eremin S.A., Ermolaeva T. N., Piezoquartz immunosensors for the flow detection of sulfonamides in liquids // Sensor 2005. No 2. 14-20.
- ✓ Kalmykova E.N., Ermolaeva T.N. Quartz crystal immunosensors. I. The registration of the heterogeneous immunochemical reactions by quartz crystal microbalance method // Izv. vuzov. Khim. and khim. technol. 2005. Vol. 48. No 12. 76-80.
- ✓ Kalmykova E.N., Ermolaeva T.N. Quartz crystal immunosensors. II The selective quantification of the biological active substances in liquid media // Izv. vuzov. Khim. and khim. technol. 2005. Vol. 48. No. 12. 92-95.

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- ✓ Kalmykova E.N., Dergunova E.N., Ermolaeva T.N., Gorshkova R.P., Komandrova N.A. Quartz crystal immunosensors on a base of lipopolysaccharides immobilized for determination of antibodies to bacteria *Yersinia enterocolitica* // *Sorpts. Khromatogr. Prosessy*. 2006. Vol. 6. No 3. 415-422.
- ✓ Ermolaeva T. N., Dergunova E. S., Kalmykova E. N., and Eremin S. A.. Flow-Injection Determination of Nonylphenol in Liquid Media Using a Piezoelectric Immunosensor // *Journal of Analytical Chemistry*, 2006, Vol. 61, No. 6, 609-613 (2006). *Zhurnal Analiticheskoi Khimii*, 2006, Vol. 61, No. 6, pp. 660–665.
- ✓ Melikhova E.V., Kalmykova E.N., Eremin S.A., Ermolaeva T.N. application flowing пьезокварцевого иммуносенсора for definition сульфаметоксазола in objects of an environment // *Journal of Analytical Chemistry*. 2006. Vol. 61. No 7. 687-693. *Zhurnal Analiticheskoi Khimii*, 2006, Vol. 61, No. 7, pp. 744-750.
- ✓ Ermolaeva T.N., Kalmykova E.N. Piezoelectric immunosensors: analytical opportunities and outlooks // *Russian Chemical Reviews*. 2006. Vol. 75. No 5. 375-396. *Uspekhi khimii*. - 2006. V. 75. - №5. - pp. 445-459.
- ✓ Kalmykova E.N., Garbuzova A.V., Shashkanova O.J., Zubova N.Yu., Ermolaeva T.N. Quartz crystal microbalance immunosensors on the base of antibodies immobilized for detection of bacteria *Yersinia enterocolitica* in water media // *Izv. vuzov. Khim. and khim. technol.* 2007. Vol. 50. - No. 9. 10-15.
- ✓ Shashkanova O.Yu., Dergunova E.S., Kalmykova E.N., Ermolaeva T.N. Flowing piezoelectric immunosensor for determination of bacteriophage. // *Sorpts. khromatogr. protsessy*. 2007. Vol. 7. No 4. 548-555.
- ✓ Kalmykova E.N., Melikhova E.V., Eremin S.A., Ermolaeva T.N. Sulfamethoxazole Detection by Piezoelectric Immunosensor // *Antibiot. Khimioterap.* 2004. Vol. 49. No 1. 8 - 13.

## 7. Prof. Tatyana N. Ermolaeva, PhD

Department of Chemistry

**Organization Name:** Lipetsk State Technical University  
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**Address:** Moskovskaya st., 30, 398600, Lipetsk, Russian Federation

*Is interested in participation in a project that will be prepared and submitted in the following topics:*  
**Development of new flow injection quartz crystal immunosensors for food reliability control**

**Call identifier: FP7-KBBE-2010-4**

### Expertise:

We search for partners in the field of development of new immunoanalytical technologies for express quantification of drugs, pesticides, endocrine destructors, hormones and other biological active substances in food stuffs and agricultural products. Since 1999 the science interest of Division is focused to investigation and development of QCM-sensors for diagnostics of gas and liquid media. The development of QCM immunosensors for analysis of different environmental objects and biological liquids is carried out more active. QCM sensors are developed for quantification of drugs, metabolites in biological liquids, toxic organic compounds (sulphonamides, phenols, polyaromatic carbohydrates) in environments and food stuffs, bacteria and bacteriophages in liquids.

### Problems to be solved and results:

Development of QCM sensors and multisensor systems for quantification of low concentration of pollutants, pesticides, endocrine destructors, chemical toxins and micotoxins, microorganisms in foodstuffs. Spent researches will be directed to increase productivity, sensitivity and profitability of the measurements which are carried out in a flow-injection mode. Developed devices will be tested for the further application at estimating the safety of foodstuffs, ecological objects.

### Publications on the topic:

- ✓ T.N. Ermolaeva, E.N. Kalmykova. Piezoelectric immunosensors: analytical potentials and outlooks, *RUSS CHEM REV*, 75 (5) (2006) 397-409.
- ✓ E.V. Melihova, E.N. Kalmykova, S.A. Eremin, T.N. Ermolaeva. Using a piezoelectric flow immunosensors for determining sulfamethoxazole in environmental samples, *Journal of Analytical Chemistry*, 61 (7) (2006) 744-750.



<http://www.ric.vsu.ru>

- ✓ T.N. Ermolaeva, E.S. Dergunova, E.N. Kalmykova, S.A. Eremin, Flow-Injection determination of nonilphenol in liquid media using a piezoelectric immunosensor, *Journal of Analytical Chemistry*, 61 (6) (2006) 665.
- ✓ E. N. Kalmykova, E. S. Dergunova, N. Yu. Zubova, R. P. Gorshkova, N. A. Komandrova, T. N. Ermolaeva. Determination of Antibodies to Yersinia enterocolitica Bacteria Using a Piezoelectric Quartz Crystal Immunosensor. *Journal of Analytical Chemistry*, . 62 (10) (2007) 970–976.
- ✓ E.V. Melihova, E.N. Kalmykova, S.A. Eremin, T.N. Ermolaeva. Estimation of methods immobilization of immunoreagents on a surface of the piezoelectric sensor for determination sulfopreparation in liquid media, *Sorption and chromatographic processes (Russia)*, 6 (1) (2006) 99-107.
- ✓ E.V. Melihova, S.A. Eremin, T.N. Ermolaeva. Method of detection of residual quantities of sulfamethoxazole in food, *Hygiene and sanitary(Russia)*, 4 (2006) 85-87.
- ✓ E.N. Kalmykova, E.S.Dergunova, R.P. Gorshkova, N.A. Komandrova, T.N. Ermolaeva. Quartz crystal immunosensors on a base of lipopolysaccharides immobilized for determination of antibodies to bacteria Yersinia enterocolitica, *Sorption and chromatographic processes(Russia)*, 6 (3) (2006) 415-422.
- ✓ Yu.V. Nartova, S.A. Eremin, T.N. Ermolaeva. Piezoelectric immunosensors for determination of acetochlorine in liquid media, *Sorption and chromatographic processes(Russia)*, 6 (5) (2006) 764-772.
- ✓ E.N. Kalmykova, A.V. Garbuzova, O.Yu. Shashkanova, N.Yu. Zubova, T.N. Ermolaeva. Quartz crystal microbalance immunosensors on the base of antibodies immobilized for detection of bacteria Yersinia enterocolitica in water media, *Izv. vuzov. Khim. and khim. technol(Russia)*, 50 (9) (2007) 10-15.
- ✓ Yu.V. Nartova, T.N. Ermolaeva, M.R. Flejsher, R. Abuknesha, S.A.Eremin. Determination of Alaclor in Food Products by Fluorescent Polarisation Immunoassay. *Journal of Analytical Chemistry*, . 63 (5) (2008) 546–553.

## 8. Vladimir P. Bararajkin

Head of the Ltd Company

<b>Organization Name:</b>	<b>Co Ltd “Ecological technologies”</b>
<b>E-mail address:</b>	<a href="mailto:bararw@mail.ru">bararw@mail.ru</a>
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*Is interested in participation in a project that will be prepared and submitted in the following topics:*  
*Sustainable inland extensive and semi-intensive aquaculture; Prospects for novel foods;*  
*Prospecting for novel plantproduced compounds; Innovative biotechnology approaches as eco-*  
*efficient alternative to industrial processes; Sustainable Biorefineries; Enhancing exchange of*  
*information, synergies and cross-fertilisation between projects in the field of Biorefineries*

**Call identifier: FP7-KBBE-2010-4**

### Short description of the organization:

Our company is involved in development of technologies on processing waste since 1998 activity: the Basic directions: ecology, processing of waste; creation of new production from wood and other waste; microweed *Chlorella vulgaris* in sewage treatment, veterinary science, medicine. New economic and effective technologies in agriculture. New opportunities of treatment of oncology, a tuberculosis and other infectious diseases

### Expertise:

Have been developed technology of processing of woodworking waste, manufactures of plywood, wood-particle board, Medium Density Fiberboard, celluloid-paper and biomedical manufacture in certificated proprietary fertilizer. New economic technologies in agriculture.

In medicine are carried out researches and positive results are received at treatment and preventive maintenance of infectious and other diseases: oncology, a tuberculosis, gastroenteric and others

treatment of the bird's flu and a HIV-infection is possible. Together with medical institutes of Penza we can finish preparations and check up efficiency of their action. Similarly and for veterinary science

### **9. Prof. Tamara V. Oliva**

Head of the Center of biotechnological research

**Organization Name:** Belgorod State Agricultural Academy  
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*Is interested in participation in a project that will be prepared and submitted in the following topics:*  
*Development of recommendation on ecological safety agricultural technology and management quality of the agricultural product on base of the progressive methods to agricultural biotechnology*

**Call identifier: FP7-KBBE-2010-4**

#### **Expertise:**

The elements of the functional feeding are firmly present in life of the person. The necessary development alternative modern biotechnological ways of increasing to productivity animal and birds. This will provide the arrivals on modern market of the ecological clean product. Resistance to medicinal preparation beside agricultural animal is presently discovered beside bacterial intestinal flora person. So follows to spare emphases for biotechnological aspect of medical microbial ecology. There are developed biotechnologies of increasing to productivity agricultural animal and birds with using modern ecological preparation: probiotic, symbiotic and prebiotic on base of the medicinal plants. There are studied new characteristic, created in laboratory, the probiotic directed actions, selected from organism of bird. Technological acceptance will is perfected for its industrial production. Created biotechnological preparation is used as alternative antibiotic.

Expected results: There will be designed biotechnologies of increasing to productivity agricultural animal and birds for reception of the ecological clean product with using the modern methods to agricultural biotechnology. Efficiency of biopreparations usage: increasing rate of growth, safety and increase the alive mass on 4-10% at the average. There will be last agronomic work for growing of the medicinal plants in vegetable garden of the medicinal plants of the academy.

#### **Publications on the topic:**

- ✓ Oliva T.V. To question of the microbial ecology of the bowels broiler // Reports Moscow society testers of the nature, the Biotechnology - a guard surrounding ambiances, t. 39, 2006
- ✓ Oliva T.V. New probiotal preparation LAKTO-11 for the growing broilers // Material to All-russian scientific practical conference. "Actual problems of the development agricultural complex" - Saratov - 2006
- ✓ Oliva T.V. The perspective possibilities to agricultural biotechnology. From experience of the functioning (working) the Centre biotechnological studies // Journal "Belgorodskiy agromir", 7 (33) (2007), p. 18 - 27
- ✓ Oliva T.V., Kurohta T.I., Diyakova N.P., Trubaeva L.V. Using of the simbiotic for broilers // Journal "Modern scientifically based technologies ", № 7 - 2006
- ✓ Oliva T.V., Tokar V.V., Rubanova E.N. Biotehnologicheskie aspects to agricultural microbial ecology of the bowels pigs // International scientific practical conference "Actual problems to veterinary pathology and morphologies animal", Voronezh, I "Scientific book" 2006, p.1082-1090
- ✓ Oliva T.V. Importance of the using biopreparation under выращивании телят // 1 International scientific practical conference "Formation of the modern science - a Material, that 9.- Dnepropetrovsk.- 2006.- p. 30-31.
- ✓ Oliva T.V. Possibilities of the use of the simbiotics for change traditional medicinal preparation // 3 International scientific practical conferences "Quality of the science - a quality to lifes", "Quality of science - quality of a life", Sector conference, Tambov. - 2007. -p.298-300
- ✓ Oliva T.V. The New biopreparation LAKTO-11 of the directed shaping for bowels birds. // Collection material 3 international scientifically-practical conference "Global Scientific Potential", Sector conference, Tambov. -2007. - p.186-187.

**Description of previous and present experience in International Cooperation:**

1. Acronym and title: Charities Aid Foundation – CAF , British American Tobacco - BAT  
Type of project and programmer: 106/TF-34/187/689 from March 14 2005  
Period of implementation March 14 – 15 July 2005
2. Acronym and title: Charities Aid Foundation – CAF , British American Tobacco - BAT  
Type of project and programmer:  
№305/ТФ-59/689 от 2 July 2005  
Period of implementation 24 June - 4 July 2005

## 2.1. Sustainable production and management of biological resources from land, forest and aquatic environments

### 10. Dr. Igor Ur. Isakov, PhD

**Organization Name:** Voronezh State Academy of Forestry Engineering  
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**Telephone:** +7-4732-537606  
**Address:** Timiryazeva str., 394613, Voronezh, Russian Federation

*Is interested in participation in a project that will be prepared and submitted in the following topics:*  
*Forecasting forest diversity under the influence of climatic changes and the consequences for stability and productivity of forest ecosystems*  
*The influence of inbreeding on the display of some quantitative features in a downy birch and silver birch*

**Expertise:**

Inbreeding, or closely related crossing, is always connected with the decrease of phenotypical values of quantitative features in certain groups of plants. Inbreeding in self-pollinating plants (wheat, barley, peas, beans, peppers, citrus plants, cotton, etc.) is a normal phenomenon. In cross-pollinating plants and animals inbreeding can result in the action of harmful recessive genes, which in a homozygous state cause partial (sublethal and subvital genes) or full (lethal genes) destruction of organisms. Harmful influence of inbreeding is often revealed, for example, in self-pollination of corn, potatoes or cabbage (the decrease in intensity of growth, fertility; the appearance of anomaly and deformities). In hens annual coupling «brother x sister» leads to the hereditary decrease in egg-laying qualities and vitality. In human beings marriages between cousins result in the growth of frequency of hereditary diseases (especially rare ones) in children; inborn deformities, stillbirths and deaths in early age are more frequent than in unrelated marriages, by 24—48 %.

It is suggested to check the effects of inbreeding on quantitative features of woody plants (tree height, trunk diameter) by carrying out a controllable self-pollination and free pollination in a downy birch and silver birch.

Expected results: Stage-by-stage production of a necessary plant material will make it possible to check the necessary theoretical preconditions obtained as a result of tests on annual plants. An ultimate aim of the work is to obtain selfed lines in birch.

### 11. Prof. Alexey I. Chernodubov

Head of the Chair

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*Is interested in participation in a project that will be prepared and submitted in the following topics:*  
*Genetics, selection and reproduction of tree species*

**Expertise:**

<http://www.ric.vsu.ru>

Cytological monitoring of insular coniferous forests of forest-steppe (Khrenovskoy, Usmanski), structure based on the isoenzymes and essential oil analysis of natural coniferous forests and artificial plantations.

Obtaining new forms on the basis of hybridization of poplar, birch and alder. Technologies of creating oak cultures in oak groves.

Expected results: Monitoring of insular coniferous forests; poplar, birch and alder brands.

## **12. Prof. Larissa I. Bel'chinskaya, DSc**

Head of the Chemistry Chair

**Organization Name:** Voronezh State Academy of Forestry Engineering  
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**Address:** 8, Timiryazeva str., 394613, Voronezh, Russian Federation

*Is interested in participation in a project that will be prepared and submitted in the following topics:*  
***Elaboration of profitable environment protecting technologies for treatment of air and waste waters from highly toxic organic substances at woodworking enterprises***

### **Expertise:**

Main components of gaseous and liquid wastes from woodworking industry are phenol, formaldehyde, styrene, acetic and formic acids and several other substances highly toxic for environment. In order to elaborate profitable, resource-saving and environment protecting technology it is suggested to apply new economically sound high effective adsorbents on the bases of natural materials (clay minerals), as well as synthetic sorbents obtained from wastes of woodworking industry.

Present project is directed to solution of the following tasks:

1. Investigation of adsorption of industrial toxicants from the air and production areas of manufactures by natural materials (zeolite and clay minerals);
  2. Investigation of adsorption of organic substances from industrial waste water;
  3. Increase of selectivity and efficiency of natural sorbents by means of thermal and reagent modification (acid and base treatment); activation with polyorganosiloxanes;
  4. Synthesis and investigation of adsorption properties of new sorbents obtained from wastes of woodworking industry;
  5. Development of technology for purification of waste waters and the air of production area of manufactures;
  6. Development of an effective and environment friendly method for utilization of waste sorbents;
- Application of the sorbents for practical waste waters and air treatment at real manufactures.

## **13. Prof. Mikhail V. Drapaljuk, DSc**

Chair of mechanization of a forestry and designing of machines

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*Is interested in participation in a project that will be prepared and submitted in the following topics:*  
***Development of technological operations and machines for the accelerated cultivation of a landing material and reforestation***

### **Expertise:**

Development of technological operations and machines for the accelerated cultivation of a landing material and reforestation Problems to be solved and results: Technological operations on the accelerated cultivation of the seedlings of various breeds in nurseries will be proved. Mathematical models will be created and geometrical and kinematics parameters of working bodies of machines for their realization are optimized. The technological operations providing accelerated development of wood cultures will be developed. Metamathematical models will be created and geometrical and kinematic parameters of working bodies of machines for them are optimized.

#### **14. Prof. Emma V. Karaseva, DSc**

Chair of Genetics, Cytology and Bioengineering

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*Is interested in participation in a project that will be prepared and submitted in the following topics:*  
**Optimization of technology of the petropolluted objects microbiological cleaning in conditions of the Black Sea coast**

#### **Expertise:**

Black sea is the unique geographical object demanding steadfast attention of ecologists because of high ecological vulnerability. The big anthropogenous loading alongside with growing export of hydrocarbonic raw material, and also drill works on the Black Sea shelf makes dependent recreational function of the Black Sea coast from technologies of liquidation of pollution by mineral oil. Because of specificity of distribution of alive organisms in its water area, the significant role in preservation of a biodiversity belongs to coastal zones. Technologies of biological clearing used in the Black Sea region from mineral oil have a number of advantages before physical and chemical approaches. However, modern methods do not take into account a number of conditions of the Black Sea region that affects efficiency of protection of an environment from hydrocarbons. Development of production schedules on clearing petropolluted sites in conditions of the Black Sea region is offered. The multilevel technology assumes various methods and the approaches designed for different degrees of oil pollution:

- ✓ Activation of natural oil-degrading bacteria by physical and chemical methods;
- ✓ Creation of favorable physical conditions in a zone of biocleaning using the natural sorbents received from local raw material;
- ✓ Processing by immobilized oil-degrading microorganisms and the bacterial suspensions utilizing adsorbed and floating oil;
- ✓ Use of a microbial biomass with positive buoyancy for clearing a surface of the water polluted with oil;
- ✓ The control of restoration of a microbial biodiversity of technologically broken ecosystems

Problems to be solved and results: The purpose of the project is improvement of environmental protection from hydrocarbonic pollution by means of adaptation biocleaning technologies to conditions of the Black Sea region. The project is directed on the decision of the following tasks: An estimation of the factors limiting microbiological utilization of oil pollutants in conditions of the Black Sea region, including sea water and coastal sands; Studying of microorganisms from sites, polluted with hydrocarbons; Drawing up of operative information base of technological properties of the oil-degrading microorganisms allocated from estuaries, a shelf of Black sea, and also sands and soils; Drawing up adapted to conditions of the Black Sea region of production schedules of bioaugmentation, and also biostimulation in vitro, basing the received database.

#### **Description of previous and present experience in International Cooperation:**

INTAS 01-2151 "New Approaches to the Bioremediation of Oil-Contaminated Soils and Crude Oil Wastes Using Immobilised Hydrocarbon-Oxidising Bacteria"

#### **15. Prof. Sabir V. Kadyrov, DSc**

**Dr. Vladimir N. Obratsov**

Agronomical faculty, Chair of plant growing, feed production and agro technology; Chair of selection and seed breeding

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*Is interested in participation in a project that will be prepared and submitted in the following topics:*

<http://www.ric.vsu.ru>

*Legumes: key multifunctional legume crops for an energy-efficient and environmentally friendly future European agriculture*

*Multifunctional grasslands for sustain-able and competitive ruminant production systems and the de-livery of ecosystem services*

*Improving performance and quality of crops in the context of organic and low-input systems by breeding and management*

#### **Short description of the organization:**

Voronezh State Agriculture University (VSAU) was founded in 1912. At the present time over 16 thousand students take classes and courses for 25 specialties throughout nine departments. More than 100 professors and over 350 Candidates of Sciences and associate professors work in the University. Agrouniversity is the largest scientific center of the Central Chernozem Region, the generator of ideas on further development and reformation of Russian agriculture. Agricultural department - one of the oldest and basic departments in VSAU. In the time of its existence the department made an inestimable contribution to the development and formation of the University, as well as to the process of training qualified specialists for the agriculture of Chernozem Region. The department has played a great role in the development of agricultural, bio-logical and plant growing sciences.

#### **Expertise:**

The scientific researches of agricultural department include the relevant topics on study and selection of the best breeds: soybean, lentil, chickpea, pea, broad beans, grain and sugar sorghum, solid winter wheat, rape and others; our department develops resource-saving and nature-conservation technologies for the cultivation of these cultures, including winter soft and spring solid wheat, winter Vicki, lucerne, clover, horned lyadvenets, festulolium and other permanent grasses for seeds and green feed.

#### **Publications on the topic:**

- ✓ Fedotov V.A. Rape in Russia/V.A. Fedotov, S.V. Goncharov, and V.P. Savenkov. - M.: Agro-league of Russia, 2008. - 336 p.
- ✓ Fedotov V.A. Potatoes in the chernozem wooded steppe/V.A. Fedotov, A.V. Butov, S.V. Goncharov. - Voronezh: VSAU, 2005. - 312 p.
- ✓ Stolyarov O.V. Chickpea (*Cicer arietinum* L.)/O.V. Stolyarov, V.A. Fedotov, N.I. Demchenko/under the editorship of V.A. Fedotov. - Voronezh: published by VSU, 2004. - 256 p.
- ✓ Kadyrov S.V. Technology of programmed crops in the Central Chernozem Region/S.V. Kadyrov, V.A. Fedotov. - Voronezh: ed. - printing firm, Voronezh, 2005, 544 p.
- ✓ Fedotov V.A. Brewery barley in Russia/Goncharov S.V., Rubtsov A.N. - M.: LLC "Agro-league of Russia", 2006, 272 p.
- ✓ Shchedrina D.I. Improvement in hay-fields and pastures in Central Chernozem Region/D.I. Shchedrina, M.I. Nenarokov, Y.M. Nenarokov, A.F. Popov. - Voronezh, published by VSAU-2004. - 225 p.
- ✓ Fedotov V.A. Agro-technologies of grain and industrial crops in the Central Chernozem Region/Fedotov V.A., Sviridov A.K., Fedotov S.V., Syromyatnikov Y.D. - Voronezh: Istoki, 2005.- 164 p.
- ✓ Shchedrina D.I. Lucerne in the Central Chernozem Region/D.I. Shchedrina, V.V. Kolomeychenko, A.N. Zimin, L.I. Saratovskiy. - Voronezh: VSAU, 2002. - 160 p.
- ✓ Kadyrov S.V. Soybean in the Central Chernozem Region/S.V. Kadyrov, V.A. Fedotov, V.E. Shevchenko. - Voronezh: VSAU, 1998. - 151 p.

#### **Description of previous and present experience in International Cooperation:**

- ✓ Within the project of Tasis FD RUS 9602 ("Restructuring of agricultural enterprises in the Central Chernozem Region") a number of by-farm cultivated grasslands were created in Voronezh and Lipetsk regions. During three years of use such pastures showed high economic efficiency. Legume-grass pastures made it possible to optimize meadow and field feed production, solved the problem of fodder protein, reduced the prime cost of milk, restored the health of herds, and improved the life environment of animals.
- ✓ PSO 06/RF/1/90 Potato sector of Voronezh region (2006-2008)

## 16. Dr. Alexey I. Sivolapov

Chair of Forest Stands and Breeding

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*Is interested in participation in a project that will be prepared and submitted in the following topics:*  
**Assessing and reducing vulnerability of European forests to climate change and the consequences for industrial and societal needs**

### Short description of the organization:

Expectations: VSAFE was established in 1930. There are 6 faculties recently. Main directions of the work:  
1. Widening and extending of international cooperation among forest research organizations and among organizations specialized in the sphere of higher vocational education.  
2. As far as we have got great number of natural and artificial forest objects, we are interested in obtaining more full biological and technological information about their structural and functional peculiarities, especially from the point of view of genetics. In order to obtain such information it is important to use the methods of molecular genetics (search and use of protein and DNA markers of selected characteristics).

### Expertise:

Forestry faculty suggests estimation of the following resources:

1. Biodiversity and recovery of main forest species of Russian South;
2. Intrapopulation structure of autochthonous populations of *Pinus silvestris* L., oak (*Quercus robur*), silver birch (*Betula pendula* L.), downy birch (*Betula pubescens* L.), *Populus tremula* L., *Populus* L.;
3. Cytologic estimation of selectional and rare forms of wood plants;
4. Physiological estimation of condition of selectional forms of birch;

### Publications on the topic:

- ✓ Isakov I.Yu. (2005) Morphological variability of leaves in some artificial Birch hybrids (International Botanical Congress, Vienna, Austria, July 17-23. P. 632).
- ✓ Isakov I. Growth dynamics of local Birch families obtained by different pollination types // VI International Meeting of Young Scientists «Eurasian Forests – Hungarian Forest», Moscow - Sopron, PH MSFU, July 4-9, 2006.- P. 46-48.
- ✓ Isakov I. Inheritance of leaf's shape in some birch hybrids // VII International Meeting of Young Scientists «Eurasian Forests – Russian North», Moscow - Petrozavodsk, PH MSFU, July 9-17. 2007.- P. 37-39.
- ✓ Isakov I., Isakov Yu. Peculiarities of growth and development of seed progeny in silver birch, downy birch and ordinary pine (*Pinus sylvestris*) produced by different pollination methods. (XX International Congress of Genetics, Berlin, Germany, July 12-17. P.323).
- ✓ Sivolapov A.I. Different levels of mixoploidy in hybrid poplars / A.I/ Sivolapov, T/A/ Blagodarova // Cytogenetic studies of forest trees and shrub species. IUFRO Cytogenetics symposium, 8 – 11. 09. 1993. – Croatian Forests, Inc., Zagreb, - 1997. – P. 311 – 316.
- ✓ Sivolapov A.I. Changeability of mixoploidy level in Tree Species as Stability Regulation Mechanism for Extreme Environment Conditions // Assessment Methods of Forest Ecosystem Status and Sustainability. Workshop (August 8-13, 1999, Krasnoyarsk, Russia). Abstracts.- Krasnoyarsk: V.N. Sukachev Institute of Forest SB RAS, 1999.-S. 152-153.

## 17. Prof. Vasily N. Popov, DSc

Chair of Genetics, Cytology and Bioengineering

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***Is interested in participation in a project that will be prepared and submitted in the following topics:***

***Bee health: identification of emerging honey bee pest and diseases and reemergence of pathogens and explaining the intimate mechanisms and the reasons for increased honey bee mortality***

**Short description of the organization:**

Voronezh State University (VSU) was established in 1918 on the base of evacuated from Estonia Russian Derpt University (est. 1802). VSU (23,000 of students/2500 staff/460 full professors) is in top 10 of Russian universities. The university consists of 18 schools including 2 schools of economics, schools of biology, chemistry, geoecology, which could be involved in project. Natural research in these subjects is carried out by Natural reserve "Galichya Gora", Biological station and Botanical Garden? Included to university structure.

**Expertise:**

The penetration of modern European technologies into the Russian agriculture has resulted in growing recognition of the economical importance of bees and bumblebees in pollinating the mainstream crops. However, their usage is still very limited in conditions of greenhouse due to the sub-optimal performance and short longevity of the imported bee and bumblebee colonies and their relatively high price. However, the former problem is likely rooted in the agricultural practices used in Russian greenhouses. The first our proposal for this project is to elucidate the causes for the sub-optimal performance and short economical lifespan of artificially reared bee and bumblebee colonies in the conditions of greenhouses. Specifically, we hypothesize that commonly used domestic pesticides impair the flight performance and decrease the longevity of bumblebees by damaging their mitochondrial metabolism. The first Aim of this proposal is to investigate the impact of the c pesticides on the flight muscle mitochondria and the flight performance and longevity of bees and bumblebees. The second objective of our proposal addresses a unique biochemical problem associated with the extremely high rate of oxygen consumption in the flight muscle of bumblebees. We hypothesize that it should result in the high rate of the production of mitochondrial reactive oxygen species (ROS) and oxidative damage to the flight muscle tissue, unless it possesses a powerful ROS-detoxifying mechanism. The second Aim of this proposal is to elucidate both the mechanism of ROS production and removal in the mitochondria of different bee species flight muscle. We will examine the rate of ROS production the activity of the mitochondrial antioxidant enzymes, the role of ROS removal by gaseous diffusion, and the antioxidant properties of flight muscle extracts. We anticipate that completing this project may yield significant economic benefits and further boost the use of bumblebees in agriculture and greenhouse industry. We also anticipate that elucidating the ROS metabolism in bumblebee's mitochondria may benefit both the basic and biomedical science by contributing to the development of an efficient therapeutic approach to combat the oxidative stress involved in etiology of a great number of human pathologies.

**Publications on the topic:**

- ✓ Popov V.N. , Volvenkin S.V., Eprintcev A.T., Igamberdiev A.U. Presence of Glyoxylate Cycle Enzymes in Liver of Alloxan-Treated Rats // FEBS Letters 1998, V.440. P. 55-58.
- ✓ Popov V.N., Igamberdiev A.U., Schnarrenberger C., Volvenkin S.V. (1996) Induction of the Glyoxylate Cycle Enzymes in Rat Liver upon Food Starvation.- FEBS Letters 390, 287-290.
- ✓ Popov V.N., Simonyan R.A., Skulachev V.P., Starkov A.A. Inhybition of alternative oxydase induces H2O2 production in plant mitochondria // FEBS Letters, 1997 V. 415, N1, P. 87-90.
- ✓ Popov V.N., Purvis A.C., Skulachev V.P, Wagner A.M. Stress-induced changes in ubiquinone concentration and alternative oxidase in plant mitochondria // Bioscience Reports. 2001. V. 21, N 3. P. 369-379.
- ✓ Popov V., Markova O., Mokhova E., Skulachev V.P. Effects of in vivo cold exposure and in vitro uncouplers and recouplers on potato tuber mitochondria // Biochem. Biophys. Acta. 2002 V. 1553, P. 232-237.
- ✓ Popov V.N. Possible role of free oxidation processes in regulation of reactive oxygen species production in plant mitochondria (review) // Biochem. Soc. Transactions. 2003. V. 31, N. 6, P. 1316-1317.
- ✓ Popov V.N., Ruuge E.K., Starkov A.A. Electron transport inhybitors influence on reactive oxygen species production in pea mitochondria // Biochemistry (Moscow), 2003. T. 68, N 7. P. 910-916.



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- ✓ Lopatin A.V.. The sequence of substrate wall cells construction in гнездах Seladonia subaurata (Rossi), (Hymenoptera, Halictidae) // Russian Zoological J.. 2003. V. 82, № 12. P. 1462-1465.
- ✓ Lopatin A.V.. Trgub T.F.. The study of traffic connection of Seladonia subaurata (Rossi) (Hymenoptera, Halictidae) bee using germ from гнезд cells // Russian J. of Ecology. 2004, V.4. C. 297-300
- ✓ Eprintsev A.T., Shevchenko M.Yu., Popov V.N. Purification and properties of isocitrate lyase from pupae of Papilio machaon butterfly// Biochemistry (Moscow). 2004. V.69, N 4, P. 376-380.

### **18. Prof. Tatyana N. Popova**

Biology and Soil Science Faculty, Chair of Medical Biochemistry and Microbiology

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*Is interested in participation in a project that will be prepared and submitted in the following topics:*  
*Usage of new biological active molecule; Metabolomics*

#### **Short description of the organization:**

The Voronezh State University (VSU) was established on the base of Yuryev University evacuated in Voronezh in 1918. Yuryev (primary – Derpt) University, founded in 1802 by the decree of the Russian emperor Alexander I in Derpt (later - Yuryev, nowadays Tartu), was the second Russian university. The University became the center of education, sciences and culture of Central Chernozem region and continues to carry out these functions now. Now the training of the students in Voronezh State University has been carried out at 17 faculties. The graduates of the University work in 90 countries of the world. The Department of Medical Biochemistry and Microbiology was open at VSU Biology and Soil Science Faculty in 1997. Working group of the Department (more than 10 people, from them 7 have scientific degrees) owns wide experience of work in the field of research of cell metabolism organization and regulation, enzymology. The results of the Department employees investigations lately have found the reflection in 7 candidate dissertations, tens publications in the central journals, materials of the International and Russian conferences on biological and medical subjects. The research work, spent on the Department, repeatedly was supported by the Russian and International grants.

#### **Expertise:**

Our team can bring contribution on the decision of biochemistry fundamental problem connected to research of functioning of antioxidant system (AOS) and oxidative metabolism enzymes, capable to limit free-radical oxidation (FRO), at pathologies, connected with oxidative stress (experimental models of liver toxic defeat, myocardium and brain ischemia, hyperthyroidism at rats), and also at action of substances-protectors (thioctic acid, citrate, melatonin and several synthetic substances, received at Voronezh State University Chemical Faculty). Estimation of free-radical processes intensity in analysed tissues is realised by biochemiluminescence method, giving the integral characteristic of a FRO level, definition of the contents of lipid peroxidation primary products – diene conjugates, and DNA fragmentation as index of apoptosis development degree. Activity of AOS enzymes (superoxide dismutase, catalase, glutathione reductase and glutathione peroxidase) and level of some antioxidants ( $\alpha$ -tocopherol, citrate, glutathione) in liver, myocardium, brain and blood serum at pathologies and protectors action are investigated. The research of aconitase, citrate synthase, NAD- and NADP-isocitrate dehydrogenases, NAD- and NADP-malate dehydrogenases, glucose-6-phosphate dehydrogenase and 6-phosphogluconate dehydrogenase functioning with application of purified enzyme preparations is also spent. The research of these enzymes expression regulation is realized. The reception of the information about properties of the enzymes capable to participate in a FRO intensity regulation in an organism by interaction, will allow to come nearer to comprehension of new aspects of antioxidant system enzymatic and not enzymatic components activity linking and regulation in mammals functionally various tissues at pathologies connected with oxidative stress development, and action of substances - protectors. The investigation of biochemical bases of reactive oxygen species formation regulation with the help of substances-protectors promotes clarification of molecular mechanisms of FRO intensity increase, which is a universal non-specific link in various diseases pathogenesis, prevention.

**Publications on the topic:**

- ✓ T.N. Popova, T.I. Rakhmanova, K.-J. Appenroth. Cytosolic and chloroplastic NADP-dependent isocitrate dehydrogenase in *Spirodela polyrhiza*. Regulation of activity by metabolites in vitro // *J. Plant Physiology*. - 2002. - V.159. - P. 231-237.
- ✓ T.I. Rakhmanova, T.N. Popova. Regulation of 2 Oxoglutarate Metabolism in Rat Liver by NADP Isocitrate Dehydrogenase and Aspartate Aminotransferase // *Biochemistry (Moscow)*. – 2006. - Vol.71, No.2. - P. 211-217.
- ✓ A.N. Pashkov, S.S. Popov, A.V. Semenikhina, T.I. Rakhmanova. Glutathione system state and activity of some NADPH-producing enzymes in rats liver under melatonin action at norm and toxic hepatitis // *Bull. Exp. Biol. Med. (Moscow)*. – 2005. – V. 139, No. 5. – P. 520-524.
- ✓ A.N. Pashkov, S.S. Popov, A.V. Semenikhina, T.I. Rakhmanova. Oxidative status of rat serum blood at toxic damage of liver and melatonin action // *J. Theoret. and Pract. Med. (Moscow)*. – 2006. – V. 4, No. 1. – P. 93-96.
- ✓ E.M. Andreescheva, T.N. Popova, V.G. Artyukhov, T.I. Rakhmanova, L.V. Matasova. The intensity of free radical oxidation and catalytic properties of rat liver NADP-isocitrate dehydrogenase in the norm and toxic hepatitis // *Biomed. Chemistry (Moscow)*. – 2006. – V. 52, No. 2. – P. 153-160.
- ✓ M.M. Sviridov, A.V. Semenikhina, T.N. Popova. Catalytic properties of rat liver 6-phosphogluconate dehydrogenase in the norm and toxic hepatitis // *Biomed. Chemistry (Moscow)*. – 2006. – V. 52, No. 5. – P. 479-488.
- ✓ O.A. Safonova, T.N. Popova, V.G. Artyukhov, L.V. Matasova. Cytoplasmic NAD-malate dehydrogenase functioning peculiarities in rat myocardium at ischemia conditions // *Bull. Exp. Biol. and Med. (Moscow)*. – 2005. - V. 140, No. 7. – P. 31-34.
- ✓ O.A. Safonova, T.N. Popova, V.G. Artyukhov, L.V. Matasova. Free radical oxidation intensity and regulation of NADP-dependent malate dehydrogenase activity in rat cardiomyocytes in norm and under ischemia // *Biomed. Chemistry (Moscow)*. – 2005. – V. 51, No. 3. – P. 311-321.
- ✓ O.A. Safonova, T.N. Popova, V.G. Artyukhov, L.V. Matasova. Oxidative status and functioning of NAD-dependent malate dehydrogenase in mitochondria of rat cardiomyocytes in norm and under ischemia // *Voprosi Biol., Med. and Pharm. Chemistry (Moscow)*. – 2005. – No. 1. – P. 50-53.
- ✓ L.V. Matasova, A.V. Semenikhina, T.N. Popova. The influence of ascorbate and iron joint reception on free radical processes intensity in stomach and intestines tissues of rats // *Voprosi Biol., Med. and Pharm. Chemistry (Moscow)*. – 2005. – No. 2. – P. 9-13.
- ✓ A.N. Pashkov, S.S. Popov, A.V. Semenikhina, L.V. Matasova, T.N. Popova. Melatonin influence on oxidative status, citrate content and aconitate hydratase activity in rat liver under toxic hepatitis // *Probl. of Endocrinol. (Moscow)*. – 2005. – V. 51, No. 6. – P. 41-43.
- ✓ T. Popova, M.A.A. Pinheiro de Carvalho, L. Matasova, L. Medvedeva. Regulation of mitochondrial NADP-isocitrate dehydrogenase in rat heart during ischemia / *Mol. and Cell. Biochem.* - 2007. – Vol. 294. – P. 97-105. – DOI: 10.1007/s11010-006-9249-9. Article on-line: 2006. ([http://www.springerlink.com/\(xifdun55stfvfcd2zikvxyk\)/app/home/contribution.asp](http://www.springerlink.com/(xifdun55stfvfcd2zikvxyk)/app/home/contribution.asp)).

**19. Prof. Valeriy Gr. Artyukhov**

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*Is interested in participation in a project that will be prepared and submitted in the following topics:*  
*Increased sustainability of all production systems (agriculture, forestry, fisheries and aquaculture); plant health and crop protection*

**Short description of the organization:**

According to different rating evaluations Voronezh state university is in the first twenty classic universities of Russia. The collective of executors includes the best specialists in the field of genetics, cytogenetics, biotechnology, breeding in forest woody plants and ecology (1 doctor of science, 5 candidates of science,

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2 young scientists, post-graduates). Among the executers there are the members of New York Academy of Sciences and World Directory of Forest Genetics and Tree Breeders. There was developed a method for production of qualitative micropreparations of woody plant cells and for their analysis. There were chosen experimental territories with contrast levels of pollution. There were worked out highly effective technologies of clonal micropropagation of highly productive and resistant to abiotic and biotic factors for some trees of hardwoods. On their basis experimental polyclonal plantations and collections of valuable genotypes in long-term in vitro cultivation (over 15 years) were established. On the theme of investigation the collective has published over 300 articles in the leading Russian and foreign journals, has received 4 patents and 5 inventor's certificates. The project executers took part in the fulfillment of federal, regional and international programs on the announced themes both as executers and as supervisor of studies.

#### **Expertise:**

By the announced themes the collective of executers can reveal cytogenesis reactions of forest woody plants (common pine (*Pinus sylvestris* L.), European birch (*Betula pendula* Roth), English oak (*Quercus robur* L.) and poplar species (*Populus* sp.)) on anthropogenic pollution in the regions of Central Russia with different level of industrial and eco-nomic pressing, including the territories with radioactive pollution after Chernobyl accident, by use of the methods of light microscopy for cytological investigations. For the first time there will be determined daily rhythms of mitotic activity, duration of the passage of some mitosis stages by cells, frequency of mitosis disturbance, nucleolar characteristics (sizes of single pair nucleoli, types of nucleoli, frequency of persistent nucleoli on the metaphase – telophase stage of mitosis), spectrum of mitosis disturbances in seed progenies of English oak, European birch and common pine, growing in ecologically "clean" region. There will be estimated the limits of variation of cytogenetic indices (of mitotic activity, nucleolar characteristics, level and spectrum of mitosis pathologies) in nonstress conditions for the above-named species of woody plants. By use of our sense scale for the criteria of cytogenetic monitoring there will be carried out evaluation of stability of cytogenetic system in seed germs of woody plants which are important forest forming species of Central Chernozem Region. On the basis of research results there will be revealed tendencies in the change of cytogenetic indices in stress conditions, the most sensitive and resistant to anthropogenic pollution characteristics, possible cytogenetic mechanisms of adaptation for European birch, English oak and grey poplars, common pine to anthropogenic pollution on cell and subcellular level. Cytogenetic diversity of seed progeny of woody plants in Central Russia including ecologically "clean" and polluted territories and tendencies of its change in the conditions of anthropogenic load will be established. Integral effects of pollutant influence on cytogenetic indices in seed progeny of investigated species of woody plants and the most sensitive to anthropogenic pollution cytogenetic indices will be determined. It is suggested to work out some criteria for resistance evaluation of cytogenetic apparatus of forest wood plants seed progeny to anthropogenic pollution for tree selection with the purpose of their further microclonal propagation to create productive and resistant shelter forests. Working out of criteria for selection of mother trees producing faintly mutable progeny, resistant to pollution for the further forest regeneration on polluted territories, is possible. It is planned to make a method for evaluation of environmental pollution by cytogenetic indices of forest woody plant seed progeny. A formula for estimation of environmental gene toxicity for a man by cytogenetic indices of woody plants will be received. It is planned to work out effective methods for reproduction and conservation *ex situ* on the basis of bioengineering methods of selected resistant genotypes of hardwoods. There were made technological regulations for effective microclonal propagation and production of valuable (productive and resistant) genotypes of triploid white and grey poplars (receiving of aseptic viable cultures, microshoots induction, their effective rooting and multiplication, adaptation and growing of tube plants in the condition of sheltered ground). There will be received an experimental lot of planting material of *in vitro* propagated clones of woody plants. There will be worked out a method for longterm *in vitro* cultivation of the representatives of valuable gene pool of hardwoods (birch, poplar) for their conservation *ex situ*. On the basis of the results of cytogenetic and biotechnological researches recommendations for creation of highly productive and resistant forest cultures and stands with use of highly qualitative planting material will be given.

#### **Publications on the topic:**

- ✓ Artyukhov V.G., Kalaev V.N. Cytogenetic indices of English oak (*Quercus robur* L.) seminal progeny subject to radioactive radiation in the Chernobyl nuclear disaster and growing on territories with different levels of anthropogenic contamination // 20 Years after Chernobyl Accident: past, present and future: Editors E.B. Burlakova, V.I. Naidich. – New York: Nova Science Publishers, Inc., 2006. – P. 247 – 264.
- ✓ Fedorova A.I., Kalaev V.N., Prosvirina Yu.G., Goryainova S.A. Mutagenic activity of heavy metals in soil wayside slopes // Eurasian Soil Science. – 2007. – V. 40, № 8. – P. 893 – 899.

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- ✓ Kalaev V.N., Butorina A.K. Cytogenetic effect of oak (*Quercus robur* L.) trees growing on sites contaminated by Chernobyl fallout // *Silvae Genetica*. – 2006. - V. 55, issue 3. – P. 93 – 101.
- ✓ Karpova S.S., Kalaev V.N., Artyukhov V.G., Trofimova V.A., Ostashkova L.G., Savko A.D. The use of nucleolar morphological characteristics of birch seedlings for the assessment of environmental pollution // *Biology Bulletin*. – 2006. - V. 33, № 1. - P. 73–80.
- ✓ Kalaev V.N., Karpova S.S. The influence of air pollution on cytogenetic characteristics of birch seed progeny // *Forest Genetics*. – 2003. - V.10, №1. – P. 11 – 18.
- ✓ Butorina A.K., Kalaev V.N., Karpova S.S. Cytogenetic damage of human somatic cells and weeping birch cells in Voronezh districts with different levels of anthropogenic pollution // *Russian Journal of Ecology*. – 2002. – V. 33, № 6. – P. 413 – 416.
- ✓ Butorina A.K., Kalaev V.N., Mironov A.N., Smorodina V. A., Mazurova I. E., Doroshev S. A., Sen'kevich E. V. Cytogenetic Variation in Populations of Scotch Pine // *Russian Journal of Ecology*. – 2001. - V. 32, №. 3. - P. 198–202.
- ✓ Butorina A.K., Kalaev V.N., Najdenova O.S., Myagkova O.E., Vostricova T.V., Mitroshina O., Dirdina O.V., Polyakova N.A. Relationship between cytogenetic anomalies in forest trees subjected to radioactive contamination and industrial pollution with inherent defects in human infants in Central Russia // *Cytogenetic Studies of Forest Trees and Shrubs – Review, Present Status, and Outlook on the Future* (special issue of the *Forest Genetics*). - Zvolen, 2000. P. 35 - 41.
- ✓ Butorina A.K., Kalaev V.N. Analysis of Sensitivity of Different Criteria in Cytogenetic Monitoring // *Russian Journal of Ecology*. – 2000. – V. 31, № 3. – P. 186 – 189.
- ✓ Butorina A. K., Kalaev V.N. Diversity of Cytological Characteristics in Oak Under Normal Conditions // *Diversity and Adaptation in Oak Species*. Proceedings of a conference of IUFRO Working Party 2.08.05 held Oct. 12-17, 1997, College of Agricultural Sciences, The Pennsylvania State University, University Park, Pennsylvania, U.S.A. – Pennsylvania, 1998. - P. 46-48.
- ✓ Mashkina O.S., Tabackaya T.M., Starodubtseva L.M. Mass clonal propagation of Karelian birch and poplar through long-term shoot multiplication // *Russian Journal of plant physiology*, 1999. - Vol. 46, N6.- P.835-837.
- ✓ Mashkina O.S., Butorina A.K. Genetic Engineering of Forest Woody Plants // *Russian J. of Genetics*. — 2003. — Vol. 39, N 3. — P. 241-248.
- ✓ Matveeva T.V., Frolova N.V., Isakov Yu.N., Mashkina O.S., Lutova L.A. Horizontal Gene Transfer from Agrobacteria to Plants in Natural and Laboratory Conditions // *Biotechnology in Agriculture and the Food Industry*. – New York: Nova Science Publishers, Inc., 2004.– P. 109-114. (ISBN: 1-59454-119-1)
- ✓ Mashkina O.S. The formation of unreduced pollen in *Populus* exposed to high temperatures and chemical mutagens // *Cytogenetic studies of forest trees and shrub species*. – Zagreb: Croatian forest, Inc., 1997. – P. 241 – 252.
- ✓ Sivolapov A.I., Blagodarova T.A. Different levels of mixoploidy in hybrid poplars // *Cytogenetic studies of forest trees and shrub species*. – Zagreb: Croatian forest, Inc., 1997. – P. 311 – 316.
- ✓ Vostrikova T.V. Instability of Cytogenetic Parameters and Genome Instability in *Betula pendula* Roth. // *Russian Journal of Ecology*. – 2007. - Vol. 38, No. 2. – P. 80 – 84.
- ✓ Vostrikova T.V., Butorina A. K. Cytogenetic Responses of Birch to Stress Factors // *Biology Bulletin*. - 2006. - Vol. 33, No. 2. – P. 185 – 190.
- ✓ Isakov Yu.N., Kuznetsova N.F., Mashkina O.S. Level of selffertility and its genotypic causation in *Pinus sylvestris* // *Lesovedenie*. – 2000. – N2. – P.44-50. (In Russian)
- ✓ Mashkina O.S., Isakov Yu.N. On Genetic-Breeding Improvement of Poplar // *Lesovedenie*. – 2002. – N3. – P.68-73. (In Russian)
- ✓ Kuznetsova N.F. Trends of selection in the life cycle of *Pinus sylvestris* L. // *Lesovedenie*. – 2003. – N4. – P. 9 - 16. (In Russian)
- ✓ Sivolapov A.I. Grey poplar: genetics, breeding, reproduction. – Russia, Voronezh State University, 2005. - 157 pp. In Russian)

#### Patents:

- ✓ Mashkina O.S., Burdaeva L.M., Belozerova M.M., V'yunova L.N. Method of inducing diploid pollen in woody plants // USSR Inventor's Certificate no. 1166746 // *Byull. Izobret.*, 1985, no. 26. (In Russian)
- ✓ Butova G.P., Tabatskaya T.M., Skrobova L.L. Method of clonal micropropagation of Karelian birch. USSR Investor's Certificate no. 1597386 // *Byull. Izobret*, 1990, no. 37. (In Russian)

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- ✓ Patent 2237914 Russian Federation, IPK G10V9/00. The way of radonic pollution estimation of dwellings and the way of preparation of tests / Kalaev V.N., Vahtel' V.M., Babenko A.G.: The applicant and holder of patent Voronezh state univer-sity. - № 2003107512; declare. 18.03.03, publ. 10.10.04, byull. № 28. - 22 p.
- ✓ Certificate of the Russian Federation on official registration of the computer program № 2005612221. Forecasting of daily rhythms cytogenetic parameters of seed progeny of english oak / Kalaev V.N., Preobrazhenskij A.P. - Application № 2005611613. - Registration of 1.09.2005.
- ✓ Certificate of the Russian Federation on the state registration of the computer program № 2008610141. Forecasting of daily rhythms nucleoli parameters of seed progeny of pine (Pinus sylvestris L.) / Kalaev V.N., Preobrazhenskij A.P. - Appli-cation № 2007614326. - Registration of 9.01.2008.
- ✓ Certificate of the Russian Federation on the state registration of the computer program № 2008610142. Forecasting of daily rhythms cytogenetic parameters of seed progeny of pine (Pinus sylvestris L.) / Kalaev V.N., Preobrazhenskij A.P. - Application № 2007614327. - Registration of 9.01.2008.
- ✓ Certificate of the Russian Federation on the state registration of the computer program № 2008610143. Forecasting of daily rhythms cytogenetic parameters of seed progeny of birch (Betula pendula Roth) / Kalaev V.N., Preobrazhenskij A.P., Karpova S.S. - Application № 2007614328. - Registration of 9.01.2008.
- ✓ Patent for Selection Achievement № 1187 of Russian Federation. Poplar (Populus L.) Hopersky -1 / Sivolapov A.I. Priority 06.12.2000. Date of registration 17.12.2001.
- ✓ Sivolapov A.I. Poplar Priyarsky // Russia Inventor's Certificate no. 44340. State Commission of Russian Federation for Se-lection Achievements Test and Protection. № 9464178. Date of registration 15.12.2005.

Our research team takes part in performance of Russian federal, regional and international programs:

- ✓ Grants of fund "Integracia" № 70 direction 1.5/2000 (2000). Validity - from January, 1 till December, 31, 2000 and № 79 direction 1.5/2001 (2001). Validity - from January, 1 till December, 31, 2001.
- ✓ Research and development grant of Ministry of natural resources\* of Russian Federation «Biogeosphere researches of condition and dynamics of the natural environment in conditions of intensive influence of anthropogenous factors on the territory of Central Black Soil region», the state contract № BK-02-47/301.
- ✓ Research and development under the state contract with Federal agency of science and innovations from June, 25, 2007 № 02.512.11.2130 « Cytogenetic reactions of wood plants (by the example of deciduous and coniferous) on the stressful conditions caused by anthropogenous pollution, and an estimation genotoxic of environment for the human on cytogenetic parameters of wood plants».
- ✓ Grant of the President of Russian Federation for support of young Russian scientists and leading scientific schools of the Russian Federation «Cytogenetic reactions of wood plants (by the example of deciduous) on the stressful conditions caused by anthropogenous pollution and an estimation genotoxic of an environment for the human on cytogenetic parameters of wood plants» (grant MK-2587.2004.4).
- ✓ The grant of the President of the Russian Federation for support of young Russian scientists and leading scientific schools of the Russian Federation «Cytogenetics of wood plants in conditions of anthropogenous environmental contamination and the ways of adaptation» (grant MK-3481.2007.4).
- ✓ The grant of the Russian Fund of Fundamental Researches № 02-04-48800.
- ✓ The grant of the Ministry of Education of Russian Federation PD 02-1.4-142.

#### **Description of previous and present experience in International Cooperation:**

- ✓ INTERNATIONAL SOROS SCIENCE EDUCATION PROGRAM «Soros student» (1998), «Soros post-graduate student» (2000).
- ✓ Travel-grant of participation in "International Conference on: Wood, Breeding, Biotechnology and industrial expectations" (Bordeaux, France, June 11 - 14, 2001)

## 20. Prof. Vladimir A. Agaphonov, DSc

Head of the Chair

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*Is interested in participation in a project that will be prepared and submitted in the following topics:  
The increase of stability of all systems of production (agriculture, forestry, fish economy, plant health and protection of cereals. Research in the field of sustaining native ecosystems*

### Expertise:

To carry out the research the chair of botany and mycology is provided with a well-qualified research staff – one doctor of biology (specializing in botany) and six associate professors (specializing in botany and ecology). The research workers of the chair have been doing research in different fields of botany lately. The main directions of their studies are: 1) plant cover of the Middle Don basin, 2) anthropogenic transformation of the plant cover of the Middle Don basin, 3) arrangement of protection and rational use of phyto – resources of the region. In the result of the research done, a huge amount of data on eco-floristic complexes of the regional native ecosystems, rare and endemic plant species have been collected. A promising network of specially protected nature sites have been worked out on the basis of which an ecological system is supposed to be created.

As a result of the research work done a database of the plant cover condition and dynamics of the native ecosystems in the Middle Don basin (the forest- steppe zone of Eastern Europe) being under intensive affect of anthropogenic factors will be created. The database will be based on a) collection of the stock material of the plant cover of native ecosystems, b) analysis of their present state and use on the key sites. On the basis of the retrospective analysis and processing of the new data there will be established cause-effect relations between the fundamental factors of influence, and state of the plant cover of the native ecosystems. There will be assessed the prognosis of the plant cover development, worked out measures to protect and use rationally the phyto – environment of the natural landscape complexes of the region. It seems possible to make a complex, multi-level division into districts of the territory for monitoring the condition of the environment and optimizing the regional landscapes.

### Publications on the topic:

- ✓ Agafonov V.A. About some new and rare species of plants of the Central Black – Soil region// Botanical Journal – 2002, V. 87, No. 9. – p.120-124.
- ✓ Adventive flora of the Voronezh Region: hystorical, biogeographical and ecological aspects: Monograph/ Grigorievskaya A. Y., Starodubtseva H. A., Khlizova N. Y., Agafonov V. A. – Voronezh: VSU Publishing House, 2004. – p.320.
- ✓ Agafonov V. A. New data on distribution of some species of Poaceae in the forest-steppe part of the Don basin // Botanical Journal – 2004. – V. 89, No. 1. – p.117-120.
- ✓ Agafonov V. A. Steppe flora of the Middle Don basin : studying and preserving the natural ecosystems of the forest-steppe zone: Proceedings of the International Research and Practical Conference devoted to the 70-th Anniversary of the Central Black Soil Nature Reserve. (village Zapovednii, Kursk region), May 22-26, 2005, Kursk, 2005. – p.226-229.
- ✓ Agafonov V. A. Steppe, calciphilous, psammophilous and halophilous eco – floristic complexes of the Middle Don basin: their origin and protection. – Voronezh, VSU, 2006. – p.250.

## 2.1. Sustainable production and management of biological resources from land, forest and aquatic environments

## 2.2: Fork to farm: Food (including seafood), health and well being

## 21. Prof. Ivan I. Kaluzhniy

Head of the Chair

**Organization Name:** Saratov Agrarian University  
**E-mail address:** [kaluznij@mail.ru](mailto:kaluznij@mail.ru)  
**Telephone:** +7-452-692425

<http://www.ric.vsu.ru>

**Address:** 1, Universitetskaya sq., 410012, Saratov region, RF

*Is interested in participation in a project that will be prepared and submitted in the following topics:*

***Design of the programme of animal health improvement, food products safety for people and ecologically safe technologies of feeding and management of animals on the basis of digestive and intestinal tracts microflora activity increase and its influence on digestion***

**Expertise:**

The health of a man, his mental and physical activity greatly depend on food products of animal origin. Animal production quality is strongly connected with feeding and management technology.

Feeding stuffs, received in these or those conditions, manner of their production and processing is an important factor, providing the health of animals.

In this connection the development of alternative programmes, providing biotechnological way of productivity and animal health improvement, ecologically clean and safe products of animal origin is necessary.

Foundation of highly effective biotechnologies of digestive and intestinal tracts microorganisms in animals is the basis of this programme development.

It will make it possible to create new ecologically clean preparations, providing animal health stability and high productivity.

Designed highly effective preparations, activating digestion processes will be widely used in industrial husbandry.

Expected results: New biotechnologies providing stable animal health and ecologically clean high quality products for people nutrition will be designed. Using of these works will increase milk and meat production effectiveness. Profitability will be approximately 15 rubles per capita. Existing technologies do not provide animal health maintenance and ecologically clean production.

**Publications on the topic:**

- ✓ The system of profilactic complex measures in ruminant cattle rumen digestion disturbance. The international scientific conference devoted to the 100 anniversary of professor A.A. Avrorov. Voronezh: Scientific book, 2006-1135 p. Kaluzhnyj I.I., Barinov N.D.
- ✓ The biochemical and pathological processes connection in ruminants rumen. The international scientific conference devoted to the 100 anniversary of professor A.A. Avrorov. Voronezh: Scientific book, 2006-1135 p. Kaluzhnyj I.I., Barinov N.D.
- ✓ The influence of different ozone concentrations on rumen microflora activity. The materials of international scientific conference. Saratov. Publisher Latanova V.P., 2005-423 p. Kaluzhnyj I.I., Barinov N.D.

**22. Dr. Ilona B. Kometiani, PhD**

Chair of Chemistry

**Organization Name:** Kursk State University  
**E-mail address:** [ilona.kometiani@e-mail.com](mailto:ilona.kometiani@e-mail.com)  
**Telephone:** +7-4712-567310  
**Address:** 33 ul. Radischeva, 305000 Kursk, Russian Federation

*Is interested in participation in a project that will be prepared and submitted in the following topics:*

***Influence of food contaminants on early programming leading to obesity - Studying of influence of polluting substances on infringement of a metabolism and accumulation of substances in an organism***

**Expertise:**

It is planned to study distribution of people with different stages of adiposity to the attitude to this or that sociological group, on a diet, on a sort of activity, and also in relation to type of pollution of a place of residing or professional illnesses.

Problems to be solved and results: it will be established, what factors of pollution promote development of adiposity. Will recommendations for struggle against these factors are given.

### 23. Prof. Oleg B. Yatsenko, DSc

Chair of Inorganic Chemistry

**Organization Name:** Voronezh State University  
**E-mail address:** [yatsenko47@mail.ru](mailto:yatsenko47@mail.ru)  
**Telephone:** +7-4732-208356  
**Address:** Universitetskaya sq., 1, 394056, Voronezh, Russian Federation

*Is interested in participation in a project that will be prepared and submitted in the following topics:*  
***Elaboration of low-temperature methods for processing, refining and separation of the components in raw and waste materials of the foodstuff production with the use of completely new and ecological thermoelectric devices operating on the basis of Peltier and Zeebeck effect***

#### **Expertise:**

New devices have been elaborated which allow to perform oriented crystallization and melting of ice in aqueous systems containing the components of the foodstuff products. Crystallization is performed from the surface of cold fingers introduced into the bulk of aqueous system. In order to control the temperature of the cold fingers high-performance semiconductor thermoelectric converters were designed which allow to set and check quite strictly the temperature in a wide range from + 100 to – 30oC. As a result of multiple crystallization and melting a high efficiency of components separation is attained that makes it possible to purify, concentrate and extract them from original solutions in extremely clean ecological conditions. With the application of this technique power consumption is reduced while high-quality products can be obtained. The proposed technique was tested in the laboratory environment. The ability of separation and refining was demonstrated for such substances as sucrose, amino acids – glycine, lysine, phenylalanine, tyrosine and so on.

Problems to be solved and results: The proposed method allow to perform ecologically clean processing of raw and waste materials of the foodstuff production and to extract biologically active components from the waste products.

### 24. Denis V. Matusovich

Scientific research department

**Organization Name:** Kemerovo Institute of Food Science and Technology  
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**Telephone:** +7-3842-744232  
**Address:** Stroiteley av., 47, 650056, Kemerovo, Russian Federation

*Is interested in participation in a project that will be prepared and submitted in the following topics:*  
***Valorisation of by-products in food processing***

#### **Short description of the organization:**

Kemerovo Institute of Food Science and Technology was founded in 1972. KemIFST is the only Institute that does complex training of specialists for almost all branches of food industry. It has 4 departments: technological, mechanical, economical, of multilevel preparation, multistage professional training of specialists, secondary technical and correspondence one. In the Institute there 2 dissertation councils dealing with defense of doctoral and candidate thesis. KemIFST possesses the necessary and sufficient scientific, personnel and professional potential to carry out the amount of work planned. The biggest scientific schools in the country were established that are headed by honored science workers; three fourths of the faculty have scientific degrees. More than 50 patents for objects of intellectual property were received, 38 textbooks and manuals was published for the students of main branches of food industry.

#### **Expertise:**

Development of a principally new way of creating potato convenience foods with maximum preservation of food value and quality because of applying highly effective technologies excluding a possibility of bacterial, chemical and physical pollution and also creating convenience foods of a new generation of high extend of readiness by realizing innovation technologies of creating new types of food products By integration of biocatalyst, physical and chemical and mechanical ways of affecting the developed complex of technologies and experimental samples for processing the raw stuff into functional commodity products



will raise the degree of using the by-products of recycling including protein from vegetable raw stuff. Development of the new technology of potato processing will allow us to eliminate the loss of potato while storage, create reserve and hoard of long storage products, considerably enlarge the assortment of potato products. The essence is in application of biotechnological way of peeling potato with follow-up processing with conserving agents based on mixture of acids excluding a possibility of chemical and physical pollution. To ensure marketability of the production on internal and external market we provide realization of complex of arrangements on technical rearmament and reconstruction of potato-processing organizations of the region and also on provision them with potato with technological and biochemical indices under the worked out assortment in the quantity needed.

**Patent 2332014 Production way of potato convenience foods.**

**25. Denis V. Matusovich**

Scientific research department

**Organization Name:** Kemerovo Institute of Food Science and Technology  
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**Telephone:** +7-3842-744232  
**Address:** Stroiteley av., 47, 650056, Kemerovo, Russian Federation

*Is interested in participation in a project that will be prepared and submitted in the following topics:  
**Sharing food technology research and development by means of international collaboration***

**Short description of the organization:**

Kemerovo Institute of Food Science and Technology was founded in 1972. KemIFST is the only Institute that does complex training of specialists for almost all branches of food industry. It has 4 departments: technological, mechanical, economical, of multilevel prepararion, multistage professional training of specialists, secondary technical and correspondence one. In the Institute there 2 dissertation councils dealing with defense of doctoral and candidate thesis. KemIFST possesses the necessary and sufficient scientific, personnel and professional potential to carry out the amount of work planned. The biggest scientific schools in the country were established that are headed by honored science workers; three fourths of the faculty have scientific degrees. More that 50 patents for objects of intellectual property were received, 38 textbooks and manuals was published for the students of main branches of food industry.

**Expertise:**

Purpose of the work is to develop effective biocatalyst technologies of sorption of amino acids from proteins on the basis of integration of properties of bioselective adsorbents in connection with creating food products for people who suffer from heritable amino acid metabolic diseases The main task of this research work is development of specialized products for people who suffer from heritable amino acid metabolic diseases in order to bring the quality of curative ration closer to ration of healthy people (the exception to this rule, naturally, would only be different content of corresponding amino acids in curative ration) Research work is presented in the following principals:

- ✓ Studying amino acid substance and technological properties of raw stuff;
- ✓ Studying the influence of biotechnological processing of raw stuff on the principles of sorption amino acids from proteins by adsorbents
- ✓ Assessment of substance, physical-chemical and structural-mechanical properties of the received systems;
- ✓ Studying main principles and optimization of process of biocatalyst sorption of amino acids from proteins;
- ✓ Using established principles for development of technical documents;
- ✓ Development of type schemes of technological processes of food production for people who suffer from heritable amino acid metabolic diseases.
- ✓ Studying physical-chemical and biological criteria of quality and safety of the developed production.

**Publications on the topic:**

- ✓ Technological properties of protein concentrates / T.L. Ostoumova, A.G. Galstian, I.Y. Trifonov, S.Y. Ravnushkin, I.G. Kulinchic // Cheese-making and butter-making.- 2007.- №2.- pp. 53-56.
- ✓ Practical aspects of phenylalanine control in milk products and the way of its removing / L.A. Ostoumov, A.Y. Prosecov, O.O. Babich, E.A. Yakimova // Milk industry.- 2007.-№9.- pp. 71-72.
- ✓ Peculiarities of nutrition of children who suffer from Phenylketonuria / A.Y. Prosecov, A.S. Shebukova, O.O. Babich // Vestnik Kemerovo Institutue of Food Science and Technology.- Issue 5.- Kemerovo: KemiFST, 2007.- pp. 64-47.

**Patents:**

Patent of Russian Federation for the useful invention №71903 date 27.11.07 Apparatus on amino acid sorption.

### **2.3: Life sciences, biotechnology and biochemistry for sustainable non-food products and processes**

#### **26. Prof. Tamara V. Oliva**

Head of the Center of biotechnological research

**Organization Name:** Belgorod State Agricultural Academy  
**E-mail address:** [olivatv@mail.ru](mailto:olivatv@mail.ru)  
**Telephone:** +7-4722-391174  
**Address:** 1, Vavilova str., Mayskiy settlement, 308503, Belgorod region, RF

*Is interested in participation in a project that will be prepared and submitted in the following topics:*  
*Development and introduction new on base of aboriginal rhizobacterias the bacterial preparation for growing soybean in condition Belgorod area*

**Expertise:**

The object of the studies serves the aboriginal populations Bradyrhizobium japonicum. We have selected Bradyrhizobium japonicum from the cortex of the local sort of soybean. The plant of the master, with cortex, which selected the bacterias of this sort to soybean: early-ripening Lancetnaya and Belgorodskaya-48. Conducted the experiences in condition of the hothouse and permanent establishment of the academy. Our problem: define the parameters main factor ambiances optimum for realization potential activity for use the nitrogen, define efficiency specificity of the symbiosis, study the influence rhizobacterias on productivity, quality grain and productivity of the miscellaneous sort of soybean and create the new bacterial preparation.

Expected results: There is dependency of the development the soybean from degree to adopt the nitrogen of bacterias on root of the plants. The more intensive development bacteria on root of soybean positively influences upon growing, productivity of the green mass to soybean, productivity and quality grain. Chosen aboriginal populations of rhizobacterias can serve the central to making the new bacterial preparation.

**Publications on the topic:**

- ✓ Oliva T.V., Shevchenko N.S., Nikolaeva I.V. Shaping and activity of the symbiosis device for soybean when using the biopreparation // In collection: Problems agricultural production on modern stage - Belgorod, 2003. - p. 15.
- ✓ Turiyanskiy A.V. and the other Soybean on Belgorodchine //. In collection: The Materials of the counsels, Krasnodar, 2004. - p. 219-223.
- ✓ Shevchenko N.S. and others Results of the research work for the soybean for 1996 - 2003. // In collection: The Materials of the counsels, Krasnodar, 2004. - p.213-217.
- ✓ Oliva T.V., Shevchenko N.S., Nikolaeva I.V., Shevchenko G.N. Efficiency local rhizobacterias Rh-1 B // In collection: Problems agricultural production on modern stage - Belgorod, - 2006
- ✓ Shevchenko N.S., Zelenskaya T.I., Oliva T.V. The Main parameters for soybean and condition, influencing upon contents of protein // Journal "Belgorodskiy agromir", 2 (35) - 2007.

<http://www.ric.vsu.ru>

- ✓ Olive T.V., Shevchenko N.S., Shevchenko G.N, Uvarov G.I. To questions of the contents squirrel in the soybean // XI International scientific practical conference "Problems agricultural production on modern stage and way of their decision", Belgorod - 2007.

#### **Description of previous and present experience in International Cooperation:**

1. Acronym and title: Charities Aid Foundation – CAF , British American Tobacco - BAT  
Type of project and programmer: 106/TF-34/187/689 from March 14 2005  
Period of implementation March 14 – 15 July 2005
2. Acronym and title: Charities Aid Foundation – CAF , British American Tobacco - BAT  
Type of project and programmer:  
№305/ТФ-59/689 от 2 July 2005  
Period of implementation 24 June - 4 July 2005

### **27. Prof. Tamara V. Oliva**

Head of the Center of biotechnological research

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**Address:** 1, Vavilova str., Mayskiy settlement, 308503, Belgorod region, RF

*Is interested in participation in a project that will be prepared and submitted in the following topics:  
**Development biotechnology use the by-products (useful waste) agricultural animal***

#### **Expertise:**

Hundreds of a millions of the tons organic departure are formed on enterprise of the agricultural complex. In literature organic waste agricultural production begin to consider, as by-products production. Vermitehnology possible to consider, as conversion departure in product, and in ditto time as element ecological clean agricultural production, presenting system organizing-technological action on growing hybrid rain of the worms on varied substratum in concrete ecological condition, reception and using the mass of vermicomposts, both in plant growing, and in stock-breeding. The studies will be conducted in mini-vermilaboratory, hothouse complex and laboratory of the bird of the academy , in agricultural enterprise of the area. The perfected methods by vermitehnology using tracks. It is designed new methods of the using the by-products stock-breeding: organic departure animal. Designed technology of the reception to salts organic acids - calcium, vermicompost and is designed biotechnologies of the using them for agricultural animal and birds. Created population local hybrid "Belgorodskiy" will is increased. The purpose and main practical purpose planned result: development technology receptions and use the by-products agricultural animal, and exactly: preparation to salts of the organic acids calcium and faction of vermicompost under industrial technology of the growing animal and birds and in plant growing, first of all, at growing of the plants of the protected soil in hothouse facilities.

Expected results: Will is designed system organizing-technological action on vermitehnology worms on miscellaneous sub-stratum in concrete ecological condition: reception of the mass of vermicomposts, hybrid worms "Belgorodskiy", is designed biotechnology of increasing to productivity animal and birds with use biopreparation from vermicomposts: salts of the organic acids - calcium and faction of vermicomposts, the designed recommendation of the using faction of vermicomposts for growth of plants of the protected soil. Efficiency of the using preparation: increasing rate of growth and safety animal on 3-8% at the average, growing to productivities of the plants under additional use the by-products agricultural production.

#### **Publications on the topic:**

- ✓ The Oliva T.V., Nikolaeva I.V., Lazebnyh A.YU. The Reception hybrid line to local population worms - a necessities condition to efficiency utilization wastes // In sb.: Problems with/h production on modern stage and way their resheniya. - Collection of the scientific works - Belgorod, 2003. – p. 28.
- ✓ The Oliva T.V., Nikolaeva I.V., Lazebnyh A.YU. The Experience of the use of vermicomposts in hothouse facilities and reception hybrid line to local population worms // BGTU name V.G.SHUHOVA, II International scientifically conference: Ecology: formation, science, industry and health, 8.-2004.-part III,- p.112-113.
- ✓ The Oliva T.V. // Collection of the scientific works ,Material scientifically-practical conference, June 2-3 2004 projects ROLE 1064 GR 10/ISC-2003), Belgorod, 2004.- p.50-52.

<http://www.ric.vsu.ru>

- ✓ Oliva T.V., Nikolaeva I.V., Lazebnyh A.YU // Collection of the scientific works: Biotechnologies on service of the agriculture, All-russian scientifically-practical conference - Ryazani, 2004. – p. 44-47
- ✓ Oliva T.V., Pilipchuk N.S. // Collection of the scientific works: "Modern technological and aspects to breedings and developments of stock-breeding. - a Material III international scientifically-practical conference. - Dubrovicy.- 2005, that 1.- p.329-332.
- ✓ Oliva T.V., Pilipchuk N.S. Experience of the using vermitechology in ecological agricultures in Belgorodskoy area / In: "Ecological technologies - Moskva. -2005.- p.-58
- ✓ Oliva T.V., Pilipchuk N.S. Ecological aspects production and using of vermicomposts // Ecological aspects production and using of vermicomposts. - Belgorod.-2005.- 66 p.
- ✓ Oliva T.V., Aksenova YU. The using biologically active factions of vermicompost // In: Material ternational student scientific conference - Belgorod - 2006.- P. 87
- ✓ Oliva T.V. The perspective possibilities to agricultural biotechnology. From experience of the functioning (working) the Centre biotechnological studies // In journal: "Belgorodskiy agromir, 7 (33). 2007.- 27.
- ✓ 10. Larinceva T.S., Oliva T.V. Ecological aspects production and using of vermicomposts // International conference "Condition of development of village and ruralareas", Vroclav, 2007, p.111-116.

#### **Description of previous and present experience in International Cooperation:**

1. Acronym and title: Charities Aid Foundation – CAF , British American Tobacco - BAT

Type of project and programmer: 106/TF-34/187/689 from 14<sup>th</sup>, March 2005

Period of implementation March 14 – 15 July 2005

2. Acronym and title: Charities Aid Foundation – CAF , British American Tobacco - BAT

Type of project and programmer:

№305/ТФ-59/689 from 2d, July 2005

Period of implementation 24 June - 4 July 2005

#### **28. Vladimir P. Bararajkin**

Head of the Ltd Company

**Organization Name:**

**Co Ltd “Ecological technologies”**

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**Telephone:**

**+7-84161-21425**

**Address:**

Komsomolskaya st., 2-1, 442730, Lunino, Penza region,  
Russian Federation

***Is interested in participation in a project that will be prepared and submitted in the following topics:***

***Transformation of wood, waste of wood and derivatives from humus substances in additional chemicals and materials***

#### **Short description of the organization:**

Our company is involved in development of technologies on processing waste since 1998 activity: the Basic directions: ecology, processing of waste; creation of new production from wood and other waste; microweed *Chlorella vulgaris* in sewage treatment, veterinary science, medicine. New economic and effective technologies in agriculture. New opportunities of treatment of oncology, a tuberculosis and other infectious diseases

#### **Expertise:**

Recycling of all kinds of woodworking wastes, production of plywood, resin-bonded chipboard and cane fiber board, phenolic-carbamide-formaldehyde glutinous pitches and their components, glutinous products, wastes of pharmaceutical and biochemical industry, wastes of animal industries and poultry farming; their use in an agriculture as multipurpose certificated fertilizer UOMDD. Forest shelter belts - is a constant, inexhaustible source of multipurpose fertilizer UOMDD. There are patents of the Russian Federation, specifications, the certificate of conformity, the recommendation etc. Power of a wood - is a short-term rotation. We suggest developing forest shelter belts as alternative, constantly renewed, inexhaustible, resource-saving source of fertilizer for replacement of industrial mineral fertilizers and for effective reproduction of fertility of ground.

<http://www.ric.vsu.ru>

Expected results: Increase in productivity of agricultural crops at 30-100 % during 3-4-x years, downturn of charges on agriculture and plant growing on 30 %. New resource-saving adaptive technologies based on ecological compatibility and biological processes in an agriculture. Downturn of concentration of heavy metals, nitrites, nitrates and other polluting substances on 10-50 %.

### **29. Vladimir P. Bararajkin**

Head of the Ltd Company

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**Address:** Komsomolskaya st., 2-1, 442730, Lunino, Penza region,  
Russian Federation

*Is interested in participation in a project that will be prepared and submitted in the following topics:*  
**Recycling and processing all kinds of wood wastes, manufactures of plywood, fibreboards, wood-shaving plates; phenolic-carbamide-formaldehyde pitches, their components and wastes; wastes of the chemical and biochemical industry, animal industries and poultry farming and other kinds of wastes**

#### **Short description of the organization:**

Our company is involved in development of technologies on processing waste since 1998 activity: the Basic directions: ecology, processing of waste; creation of new production from wood and other waste; microweed *Chlorella vulgaris* in sewage treatment, veterinary science, medicine. New economic and effective technologies in agriculture. New opportunities of treatment of oncology, a tuberculosis and other infectious diseases

#### **Expertise:**

Recycling and processing approximately 30 % of a lump of wastes; their use in an agriculture as inexhaustible multipurpose effective fertilizer UOMDD. Their using in an agriculture as multipurpose, inexhaustible, adaptive, resource-saving, effective, certificated fertilizer long-acting organic-mineral UOMDD. New technologies in agriculture and plant growing. Sanitary-ecological actions. Restoration of the degraded grounds and reproduction of a fertile ground layer. New resource-saving, adaptive technologies in agriculture and plant growing.

Expected results: Recycling of 30-40 % of firm waste and their use in an agriculture. Creation and perfection of ecologically safe, constantly renewed, effective fertilizer. Short-term rotation of forest shelter belts, as system steady and ecologically efficient control land tenure and an inexhaustible source of raw material for manufacture of fertilizer UOMDD. Reuse of losses in nitrogen. Increase in productivity of ecologically pure cultures at 30-100 % in 1-st year and 40-150 % on 2-nd within 4th years. Improvement of ecology of district. Downturn of emissions of hotbed gases.

### **30. Vladimir P. Bararajkin**

Head of the Ltd Company

**Organization Name:** Co Ltd "Ecological technologies"  
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**Telephone:** +7-84161-21425  
**Address:** Komsomolskaya st., 2-1, 442730, Lunino, Penza region,  
Russian Federation

*Is interested in participation in a project that will be prepared and submitted in the following topics:*  
**Using certain culture of microseaweed *Xlorrella vulgaris***

#### **Short description of the organization:**

Bases of application certain culture microseaweed *Xlorrella vulgaris* in the field of veterinary science and animal industries, as fodder additive and treatment-and-prophylactic means are developed; in the field of

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ecology - clearing and disinfecting of sewage, restoration ecosystems reservoirs; medicine - immunopotentiating and treatment-and-prophylactic means of infectious and other diseases of the person.

**In medicine**, it is biogenic immunopotentiating, natural, food, biologically active additive and treatment-preventive means of diseases of the person: tuberculosis, oncology, diseases of an intestinally-gastric path; an allergy and other; Probably bird's flu, HIV-infection;

**In animal industries, veterinary science**, it is biogenic immunopotentiating, natural, fodder, biologically active additive and treatment -preventive means of diseases of animals: a tuberculosis, brucellosis, diseases of an intestinally-gastric path and other; increase in an additional weight, having bothered, egg-laying qualities and so forth on 25-40 %. Probably bird's flu;

**In the field of environment** protection it is clearing and disinfecting of sewage; rehabilitation of degraded water systems and the reservoirs polluted by chemical or other substances.

For example: "Dead" lake at village Leonidovka of Penza region where the burial place of fighting chemical poisoning ammunition earlier was made.

Expected results: Preventive maintenance and treatment of diseases: a tuberculosis, brucellosis, gastroenteric and others diseases -it is confirmed by researches at a local level. Probably, treatment and preventive maintenance of the bird's flu. It is increased an additional weight, milk yield, egg-laying qualities of hens and other on

25-40 % at downturn of charges on a feed and medicines.

Medical researches and practical application has shown good efficiency at treatment and preventive maintenance of diseases of the person: oncology, a tuberculosis, mastopathy, gastroenteric diseases and so forth. Ecological clearing – 90 100% and disinfecting – 98-100 of %.