

QUESTIONNAIRE

(*) – mandatory fields

	Details about organisation
* Organisation name	Institute of Morphology
Organisation acronym	
* Organisation Activity Type (RES - Research, HE - University, SME - Small and Medium Enterprise, IND - Industry, OTH - Other)	RES
* Keywords of main research areas	1. Hart-lung Bpass, Blood Circulation, Resustitution 2. Thyroid goiter, carcinoma, Matrix metalloproteinase environment Georgia
* Head of organisation (first name, family name)	Dimitri Kordzaya
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* E-mail	morphology@morphology.org.ge

* Description of organisation and its research achievements for the last five years (~ 5000 signs)
<p>Institute of Experimental Morphology, Georgian Academy of Sciences, has been founded at April 1, 1946. The main scientific interests of the Institute are as follows: 1. Investigation of cardio-vascular system in conditions of health and disease, in experimentally modeled pathologies; Examination of new pharmacological and/or surgical methods and their evaluation in experimental models. The peculiarities of blood microcirculatory bed have been studied, considering the structural and functional state of the regions supplied. Regional blood vessel-tissue interrelations and histo-hematic barrier importance have been investigated in response to both various functional loads and pathogenic reagents influence.</p> <p>2. Fundamentals of the malignant growth morphogenesis. Determination of the early signs of neoplasia, as well as of different alterations of the tissue elements constituting the tumor, is of a paramount importance for the oncological practice, in assessment of early diagnosis and treatment effects.</p> <p>3. Investigation of the aging process and longevity, along with evaluation of medical-biological indices. The following social factors are considered: environment, life-style, feeding peculiarities, health, capacity for work, etc.</p> <p>4. Morphology of endocrine system.</p> <p>The Institute is a pioneering Georgian organization in implementing of the radionuclid analysis, which permitted to evaluate precisely the hormones and a number</p>

of biologically active substances and their comparison with structural indices. In the meantime 12 Doctors and 37 Candidates of Sciences are working in the Institute. Total of 257 Dissertations - including 42 thesis for degree of Doctor - have been prepared and supported in the Institute. Periodical editions by the Institute: Proceedings of the Institute of Experimental Morphology - 32 volumes; Monographs - 110 volumes. Director of the Institute is [Nino Javakhishvili](#), Academician, Doctor of Medicine, Professor.

Specialized Conferences are organized regularly:

1. Experimental Morphology of Cardio-Vascular System (Four Conferences);
2. Ultrastructural Fundamentals of Cardiac- and Blood Vessels? Pathologies (Four Conferences);
3. Modern Methods of Morphological Investigation in Theoretical and Practical Oncology (Four Conferences);
4. Problems of Andrology (four Conferences);
5. Actual Problems of Gerontology and Geriatry (Nine Conferences and Symposia).

The Georgian-Russian-Latin Dictionary of Anatomical, Histological, and Embryological Terms has been published.

1.

	Contact Information
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* Position	Manager
* Qualification and research experience	Scientist-researcher
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International co-operation / Participation in EU RTD programmes or other bilateral / multilateral actions
INTAS, TACIS, TEMPUS, COST, EUREKA, other RTD programmes (please specify programme/s, project title/s and year/s)
<ol style="list-style-type: none"> 1. Traditional Medicine and Dietology – the Way to Caucasian Longevity. ISTC, Project # G-895, 2004-2007, United Kingdom. 2. "Decondensation of telomeric heterochromatin as a protective means from Atherosclerosis". STCU, Project # 4307, 2006-2008, USA, United Kingdom.

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	* Please, use “X” to indicate the scientific area/s of your potential project
CHEMISTRY	
SOCIAL AND HUMAN SCIENCES	
ECONOMIC SCIENCES	
ENGINEERING SCIENCE	
ENVIRONMENT	
AGRICULTURE AND FOOD	
HEALTH	X
MATHEMATICS	
INFORMATION SCIENCE	
PHYSICS	
NANOTECHNOLOGIES	
ENERGY	
TRANSPORT	
SPACE	

* Summary of potential research project envisaged hosting of European researcher for the period of between 1 and 2 years
<p align="center">Heart-Lung Bypass, as a Resuscitation Method During Critical Decline of Vital Functions at a Mass Casualty</p> <p>The goal of the submitted project to develop portable artificial blood circulation machine and perfusion method adjusted to the extreme conditions for improvement of the effectiveness of reanimation measures for the most severely injured patients, with the purpose of support of functioning of the disrupted vital organs, at the initial stages of evacuation from the areas of mass injury.</p> <p>Currently, in the mass injury areas, conduction of medical assistance measures is within the competence of new branch of medicine called disaster medicine. At such areas medical personnel has to operate in the extreme conditions and therefore, they require proper treatment methods and portable equipment, to ensure effective resuscitation. The world’s leading countries are currently conducting scientific research in order to improve the organizational, methodological and technological aspects of ensuring effective first aid to the injured in “massive disaster areas”, and maintenance of vital functions of organism at the evacuation stage of patients. This research is conditioned by contemporary material-technical progress and at the same time, is based on the humanism and medical ethics principles.</p> <p>It is proposed to implement the Project for three years and in four stages.</p> <p>First stage – development of the close to physiological, stationary, pulsatile heart-lung bypass machine (PHLBM) with simple structure.</p> <p>Second stage – approbation of the stationary PHLBM on the experimental animals and development of a new perfusion method.</p> <p>Third stage – creation of the pulsatile heart-lung bypass portable machine (PHLBPM), its stand testing and resource study.</p> <p>Fourth stage – development of the methods for connecting PHLBPM, approbation on the experimental animals, and testing in field conditions, scientific analysis of the obtained results</p>

and development of methodological recommendations.

To ensure successful implementation of the offered Project it is necessary to fulfill the following tasks:

1. Technical supply and processing/analysis of literature reviewed;
2. Development of the experimental models of the stationary PHLBM on the basis of the pump of our own design and its stand testing;
3. Study of hemodynamic, biochemical and morphological changes in the bio-technical complex of the PHLBM-experimental animal in case of short term (6 hours) artificial blood circulation;
4. Study of homeostasis of the organism in the conditions of long-term (12 hours) heart-lung bypass;
5. Development of the general scheme of the experimental model of PHLBPM, creating a test model and its stand-testing;
6. Development of the method of prompt connection of the PHLBPM to the organism, development of aortial cannulas equipped with obturators, testing in laboratory and extreme field conditions;
7. Scientific analysis of the obtained results, effects interpretation, formulation of the conclusions and development of the recommendations.

Project works will be implemented by 4 highly qualified main implementers and group of support personnel of 4 persons. Two members of main staff have the richest experience of work in experimental and clinical cardio-surgery (15-20 years). Both of them are authors of numerous inventions and patents in the sphere of artificial heart, lung and blood circulation, artificial maintenance of vital functions. Head of lab studies of the Project is a participant of numerous forums dedicated to the issues of terminal conditions. Fourth member of the main staff is one of the leading professionals in the sphere of anesthesiology and reanimation. All four main implementers are MD, PhD.

During the research a dynamic stand-testing, experimental modeling, descriptive statistics, Spirman range correlation, medico-biological, chromatographic, radiometric, optical-analytic and electrochemical and surgical pathologies modeling methods will be applied.

The main part of the research is proposed to be conducted in Scientific-Training Centre of Experimental Surgery of Al. Natishvili Institute of Morphology. In this laboratory project personnel will construct the experimental models of details and systems of the abovementioned equipment from the disposable pediatric heart-lung bypass sets. Testing of the resources of the machines and cannulas will be provided through permanent observation method during bench-testing. By means of the said machines, studying of perfusion hydrodynamic effects and parameters of homeostasis of the perfuse body will be provided both, with the intact test animals, and animals, to which there will be applied surgical pathology modeling method. Experiments with the animals will be conducted in compliance with American, EU, and Japanese applicable laws on animals protection and their use for the experiments. Biochemical and coagulation studies, histomorphology studies of the tissues will be conducted by means of the analyzer of express-laboratory (Blood Gasanalyser Compact-2, "Roche", Austria) and applying available standard methods.

The unresolved problem of the disaster medicine is the fact that irrespective of labor-consuming and expensive traditional resuscitation measures, heavy, combined injuries are characterized with extremely high mortality rate. Close to physiological perfusion conducted in the field conditions would ensure protection of vital organs and significantly decrease mortality rate among the injured people.

In case of successful achievement of the Project, application of the developed methodology and machine would dramatically improve the quality of medical aid and human health, rate of disability and mortality would decrease, what, finally, would provide good economical effect to the country. In addition, one of the benefits of the project is improvement of the prestige of

the Institute, through publication of the scientific works, improvement of the level of knowledge and practical skills, what would be achieved through their participation in the experimental researches.

	Please, confirm your agreement on data publication and dissemination
I agree with the publication of the data on the web-site http://www.inco-ecca.net , and dissemination among Mobility National Contact Points of the EU MS and AC (YES / NO)	I agree with the publication of the data
Date	10.12.2008

2.

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International co-operation / Participation in EU RTD programmes or other bilateral / multilateral actions
INTAS, TACIS, TEMPUS, COST, EUREKA, other RTD programmes (please specify programme/s, project title/s and year/s)
2007-2008 Project (Grant) title – “Support to Cervical cancer prevention in Georgia” – Leader – Prof. L. Gogiashvili - With: 1. International Agency on Research for Cancer (IARC) – Lyon, France 2. United Nation population Foundation (country office in Georgia)

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ENGINEERING SCIENCE	
ENVIRONMENT	X
AGRICULTURE AND FOOD	
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MATHEMATICS	
INFORMATION SCIENCE	
PHYSICS	
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TRANSPORT	
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* Summary of potential research project envisaged hosting of European researcher for the period of between 1 and 2 years
<p>Matrix metalloproteinases (MMP), their inhibitors ((TIMP) and angiogenesis in different morphological types of thyroid goiter and precancer in Georgian geoclimatological (including radiopolluted) areas.</p> <p>The aim of the research project is to study a roll of matrix metalloproteinases and their inhibitors and angiogenesis in thyroid goithertransformed and precancer processes, which could be used to develop new diagnostically and pathogenetically substantiated lines in thyroid pathology. The investigation will be conducte using intraoperative and biopsy specimens of the removed thyroid and their parts from \approx 90 patients, who lived in regions of Eastern and Western Georgia and on the Black Sea cost. The paraffin Specimens (sections) will be immunohistochemically studied by immunoperoxidase technique, by applying mono-and polyclonal antibodies to MMP-1-9, TIMP-1, VEGF.</p> <p>Thyroid precancer processes are a high risk for invasive growth due to the imbalance between the expression of MMP and TIMP and antiblastomic defense mechanisms, wich may be indirect evidence for the occurrence of precancer or other proliferation associated processes.</p>

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I agree with the publication of the data on the web-site http://www.inco-ecca.net , and dissemination among Mobility National Contact Points of the EU MS and AC (YES / NO)	I agree with the publication of the data
Date	12/09.2008