QUESTIONNAIRE

(*) – mandatory fields

	Details about organisation
* **Organisation name**	I. Beritashvili Institute of Physiology
Organisation acronym	
* **Organisation Activity** Type (**RES** - Research, **HE** - University, **SME** - Small and Medium Enterprise, **IND** - Industry, **OTH** - Other)	**RES**
* **Keywords of main research areas**	Neurobiology, atomic force microscopy, molecular biology, biochemistry, physiology
* **Head of organisation (first name, family name)**	Nargizi Nachkebia
* **Post code**	0160
* **Country**	Georgia
* **City**	Tbilisi
* **Street, House**	Gotua Street
* **Telephone (+ country & city codes)**	995 32 3703 05
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* **Description of organisation and its research achievements for the last five years (~ 5000 signs)**
I.Beritashvili Institute of Physiology is one of the famous research centers of Georgia where basic and applied research in different fields of Neuroscience is conducted. These fields include: physiology of emotion and motivation; neurobiology of sleep-wakefulness cycle; neurochemistry; cell and molecular physiology and pathology; neuropharmacology; membranology; animal behaviour and experimental stress; psychophysiology; visual physiology; physiology of pain and analgesia; neuroendocrinology; brain blood circulation and metabolism; interhemispheric interaction etc. Institute prepares high qualified specialists for universities and provides research opportunities and training courses for masters and PhD students. I.Beritashvili Institute of Physiology possesses great achievements in conducted research of following problems: Study of entorhinal and septal inputs role in memory mechanisms; Study of spatial navigation strategy in pre-school children; Influence of pre- and postnatal alcohol intoxication on limbic system development; The effect of electrical stimulation in different brain structures on brain blood circulation; Study of compensatory mechanism on external stimulus in brain blood circulation; Study of pharmacological prevention and treatment of abnormalities induced by brain thrombus infarction; Structural basics of synapse plasticity; The role of transport ATP in synaptic transmission mechanism regulation; The role of positive and negative emotions on memory and sleep-wakefulness cycle regulation mechanism; Usage of hemorheological agents in clinical research; The functional organization of pain

inhibition brain structure; neurophysiological, neuroethological and neurophysiological analyses of sleep-wakefulness cycle and various sleep disorders; Study of sleep-wakefulness cycle mechanisms; The role of sleep-wakefulness cycle phases in memory and learning; Correction of sleep-wakefulness cycle's disorder by nonpharmacological methods of treatment; The study of resistance mechanisms against psychogenetic stress and their pharmacological regulation; The limbic mechanisms of learning; Physiological and Biochemical characterization of NMDA-glutamate and sigma-opiate receptors; Glutamate-induced neurotoxicity and its protection by sigma-active substances and flavinoides; Ras/WF-kB systematic alterations in brain during hypoinsulinemical disorders; Changes in synaptic membrane receptors induced by hallucinogens and neuroendogenic processes after toxic effects and correction of these processes with herbal antioxidants, etc.

	Contact Information
* **Contact person (first name, family name)**	Mzia Zhvania
* **Department / Laboratory**	Department of Neuroanatomy
* **Position**	Head Researcher
* **Qualification and research experience**	PhD, ScD. Neuroanatomy, molecular biology, atomic force microscopy
* **Post address (house, street, city, code, country)**	14 Gotua Street, 0160 Tbilisi, Georgia
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* **Fax (+ country & city codes)**	995 32 37 3411
* **E-mail**	sxgeorgia@sigmaxi.net

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

1. Importance of thalamic reticular nucleus in development of epilepsy. Grant from Swedish Royal Academy (RN-12615), 1998-2000;
2. Adhesive properties of myelin base protein isomers. INTAS 97-1561, Euto, 1999;
3. Brain function disorders induced by depression and antidepressant action. ISTC-Japan Grant, G-391, 2000-2003;
4. Isolation and characteristics of antiepileptic compounds from the plant Aquilegia vulgaris. ISTC Grant, G-420, 2001-2004;
5. Calcium/calmodulin dependent protein kinase II and recognitive memory in chickens. English Royal Society Grant, RN gt/FSU/JP, 2001-2003
6. Amebiasis prevention in Georgia ISTC Grant, G-617, 2001-2005;
7. Ecological Monitoring of Georgian Military Territory. ISTC Grant, G-564, 2001-2004;
8. Neuroprotective effects of creatine. CRDF, GB2-2011, 2001-2002;
9. Simultaneous participation of Ras protein nitrosilation and parnesilation in neural apoptosis. INTAS 2001-0666, 2001-2004;
10. Regulation and integration of visual information stream. NATO Science Program, Collaborative Linkage Grant (LST.CLG. 980482), 2004-2005;

11. Study of sleep disorders in refugees from Abkhazia including the children born in Tbilisi. ISRS, Sanofy-Synthelabo Grant, 2004-2006;
12. Monoaminergic regulation of hippocampal and cortical seizures. CRDF Grant (GEB-2642-TB-OS), 2005-2007;
13. Main aspects of feature integration. Volksvagen Foundation Collaborative Research Grant (N 1/80096), 2005-2007;
14. Ecology, genetic groups virulence of Yersinia Pestis obtained from Rabies natural loci. CRDF Grant, GEB2-1953-TB-05, 2005-2007;
15. Signalization, learning and memory of calcium/calmodulin dependent protein kinase II. English Royal Society Collaborative Grant (RN 2005RY/JP), 2006-2008.

	* **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	
MATHEMATICS	
INFORMATION SCIENCE	
PHYSICS	
NANOTECHNOLOGIES	X
ENERGY	
TRANSPORT	
SPACE	

*** Summary of potential research project envisaged hosting of European researcher for the period of between 1 and 2 years**

I. Beritashvili Institute of Physiology is Georgian Neurobiological Center; during years scientists study the different structural elements of central nervous system in norm and under different pathological conditions, using modern methods of physiology, molecular biology, biochemistry, imaging and histology. Since October, 2008 Institute obtained atomic force microscope Bioscope II (Veeco) research at nanolevel was started.

One of the special interests is the research of dendritic spines - morphologically specialized dynamic structures of neural circuitries that reveal special vulnerability to psychiatric and neurological diseases. Studies have implicated changes in size and shape of dendritic spines in activity-dependent plasticity and have further demonstrated that spine morphology, biochemistry and biophysical properties is highly dependent on the dynamic organizational and scaffolding properties of its postsynaptic density. Thus, they become malformed or lost in epilepsy, stroke, trauma, schizophrenia, dementia, depression, normal aging and chronic substance abuse. Motility of spines is determined by a cytoskeleton composed mostly of filamentous actin. The trafficking of intracellular molecules within dendritic spines should have fundamental importance for

function and plasticity of axo-spiny synapses. To understand the mechanism of spines' motility studying of their physical properties (volume, geometry, viscoelasticity) is very important especially in different pathological conditions, because the question of changes that mature and well established spines undergo during pathological disorders still remain unclear. The nanometer-scale positioning and sub-nanonewton force probing make the method of atomic force microscopy well suited for investigation of individual spine motility and accompanying alterations of spines' cytoskeleton. Using atomic force microscope Bioscope II (Veeco) we plan to explore the possible relations between viscoelasticity on a variety of time scales and their dynamic morphology in epilepsy and drug abuse modeling experiments.

We are interested for the following actions:

- **International Incoming Fellowships (IIF).**
- **Initial training of researchers to improve mostly young researchers**

	Please, confirm your agreement on data publication and dissemination
I agree with the publication of the data on the web-site **http://www.inco-eeca.net**, and **dissemination** among Mobility National Contact Points of the EU MS and AC **(YES / NO)**	Yes
Date	10.12.08