



# **ROSTOCK GROUP**

Biomedical and biotech projects

**ROSTOCK GROUP**  
MAKING A BETTER WORLD

January 2012  
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## SNAPSHOT OF ROSTOCK GROUP



Rostock Group is a group of companies of Mr. Alexander Chikunov, former Member of Executive Board of RAO UES and business angel supporting projects that can make the world better. Rostock Group was founded in March 2009.

Financing new out-of-the-box ideas can result in breakthroughs in our knowledge. Success in that kind of projects will mean both huge advantage for the humankind and significant commercial profit.

Rostock Group is focused on providing the breakthroughs, including supporting projects that will potentially revolutionize our understanding of both the aging and disease and fundamentally shift the development paradigm for new curative and diagnostic approaches.

The Group provides commercial financing and grants to 9 biomedical and biotechnological projects, including 2 breakthrough projects that will potentially improve the human future and be significant for the society in general. In addition, the Group has selected 8 new projects that will be supported, if outside co-financing (commercial and/or non-commercial) is found.

Total financial needs for 9 existing projects of the Group are \$38m and for 8 new projects \$12m for 2012-2014. Apart from supporting the projects by own resources, Rostock Group seeks grants, donators and co-investors.

## BIOMEDICAL AND BIOTECH PROJECTS

### Projects that can result in fundamental breakthroughs

### Projects that can lead to new drugs and diagnostics

### Other projects

#### Current projects

- **SCREENING, search for longevity drugs (as well as the side project of anti-obesity drugs) - p. 9 & 10**
- **DECIPHERING THE RECEPTOR CODE, new mechanisms of drugs action – p. 8**

- SKULACHEV IONS, eye diseases – p. 13
- LONGEVICA, radioprotection, cancer – p. 14
- TELOMERE COMPLEXES, cancer – p. 15
- ALZHEIMER'S DISEASE GENES – p.16

- LIFE FREE OF RADICULITIS – p. 25

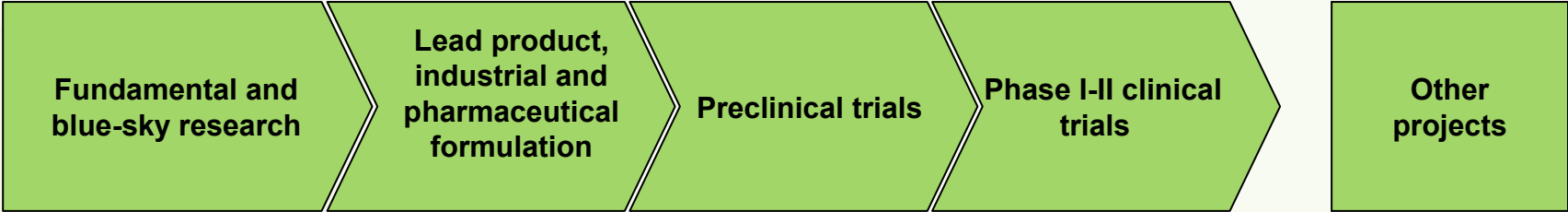
#### New projects selected for financing

- **BBB (Blood-Brain Barrier) – p. 11**

- BALDNESS GENE – p. 17
- TELOMERASE PROJECT, cancer- p. 18
- EARLY DIAGNOSTICS of neurodegenerative diseases – p. 19, cancer – p.20
- PAINKILLERS – p. 21
- LUNASENSORS, longevity – p. 22
- LONGEVITY GENES – p. 23

- COMMERCIAL GENOME SEQUENCING – p. 26

# PHASES OF DEVELOPMENT OF BIOMEDICAL AND BIOTECHNOLOGICAL PROJECTS



## Current projects

- **SCREENING, longevity drugs search – p. 9**
- **DECIPHERING THE RECEPTOR CODE, new mechanisms of drugs action – p. 8**
- ALZHEIMER'S DISEASE GENES – p.16
- TELOMERE COMPLEXES, cancer – p. 15
- LONGEVICA, radioprotection, cancer – p. 14
- OBESITY TREATMENT - p. 10
- SKULACHEV'S IONS, eye diseases – p. 13
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## New projects selected for financing

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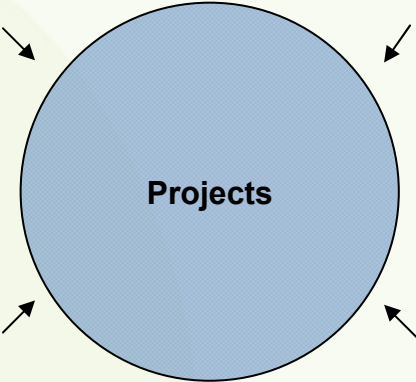
# PROJECT FINANCING

## Commercial financing

**ROSTOCK GROUP**  
Group of companies  
Established in 2009  
(Moscow, Russia)

**BREAKTHROUGH TECHNOLOGIES FUND**  
Fund is planned to be established  
in 2012

**CO-INVESTORS**  
(currently – RusNano and wealthy  
Russia individual)



## Non-commercial financing

**PRINCETON INSTITUTE OF LIFE SCIENCES (PILS)**  
Tax-Exempt Public Charity,  
Chapter 501(c)(3)  
Established in 2011  
(Princeton, New Jersey)

**DONATORS**

**GRANTS**

## INVESTMENT TEAM



Alexander Chikunov

Graduated from Novosibirsk State University (major in Economics). In 2002-2008, worked at RAO UES, Russian state energy company. Member of Executive Board of RAO UES and CEO of Business Unit #1. After the company was liquidated as a result of the reform of energy industry, founded Rostock Group.



Dmitry Khan

Graduated with distinctions from Moscow State University (major in Economics). In 1997-2001, financial manager of Menatep Bank and Oil Company YUKOS. In 2001-2006, Director, Corporate Finance, Bank TRUST. In 2007, Director, Business Development, Mining, Industrial Investors Group. In 2008-2009, Co-Head of PE Dept. of Bank Uralsib. Joined Rostock Group as Managing Director in mid-2009.



Ed Kanalosh

MD and PhD (NMU), MBA (HBS). Head of Marketing Dept. of Ukrainian Representative Office of SmithKline Beecham Pharmaceuticals. Worked at Bill & Melinda Gates Foundation (Seattle, WA), McKinsey (Florham Park, NJ, pharmaceutical and medical practice) and Cambridge Life Sciences Fund (Moscow-Kiev). Joined Rostock Group as Director, Biotech Investments, in June 2010.

## **Projects that can result in fundamental breakthroughs**

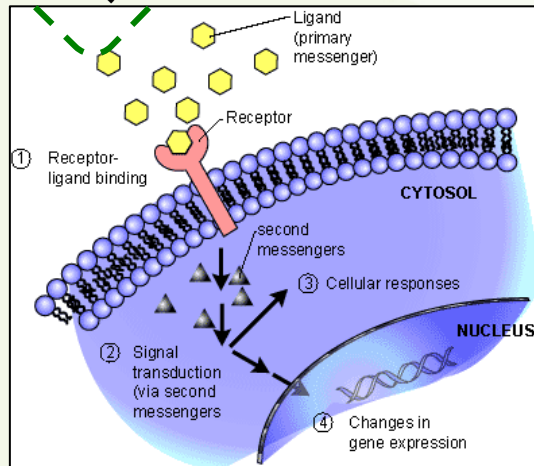
Projects that can lead to new drugs  
and diagnostics

Other projects

# DECIPHERING THE RECEPTOR CODE

## Revolutionary project forming a new drug development paradigm

Current project,  
fundamental  
research stage \*



Head scientist – Dr. A.Ryazanov,  
Prof. of Univ. Medicine and Dentistry  
of New Jersey, Inst. of Protein, MSU

### Project

Revolutionary project that can lead to establishing a new drug development paradigm and better understanding of mechanisms of action of drugs, food, placebo, meditation, music therapy, etc. The project is based on a hypothesis about basic mechanisms of drug actions on the cell level.

### Potential advantages

- Would allow to quickly and effectively develop new drugs for most diseases, incl. those incurable today

### Project stage

- Key elements of the hypothesis testing (2 years)

### Financing

- Financing needs are \$50m (if expected mega-grant received, \$20m) to verify the hypothesis and form the initial portfolio of new drugs
- Application for \$30m NIH mega-grant for 5 years submitted. Decision is expected in July 2012.

\* Here and further: green color of the frame means current projects, while blue color of the frame means new potential projects



# SCREENING

## significant prolongation of active human lifespan

Current project,  
fundamental  
research stage



Head scientist – Dr.  
A.Ryazanov, Prof. of Univ.  
Medicine and Dentistry of  
New Jersey, Inst. of  
Protein, MSU

### Project

Objective of the Project is to search for drugs that are capable of significantly prolonging the active human lifespan. More than 1,000 existing drugs are tested on 18 thousand mice in long-term survival experiment in Jackson Lab (California).

### Current Project stage

- The experiment has started in October 2009 and is planned to be completed in the first half of 2012.
- After the summer of 2012, if some groups of mice show significant prolongation of lifespan, the respective drugs will be patented as prolonging life and studied for mechanism of action.
- New mega-drug development is expected on the further stage.

### By-product result of the Project

- 5 drugs that can be used for obesity treatment are revealed (see next page)
- Large post-mortal library collected (frozen mice, parts, tissues, organs, blood, etc.)

### The next after Screening stage will be the follow-up research project

- Study the mechanisms of the life prolongation and anti-cancer activities with the following introduction of the drugs into the practice
- Introduction of anti-obesity drugs into practice
- Study the database, incl. post-mortal library

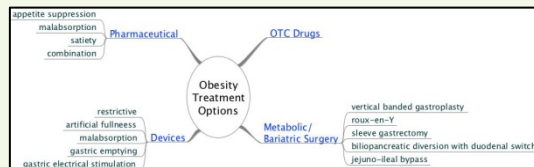
### Financing

- \$1m in 2012 to complete Screening
- \$3m in 2012-2013 for commercialization of the Project results
- \$10m for 5 years for fundamental research of Screening results, incl. mechanisms of action (e.g., that of life prolongation, revealed effects of long-term use of drugs, etc.)

# OBESITY TREATMENT

## By-product result of Screening

Current project,  
phase II clinical  
trials



Head scientist – Alexey Ryazanov,  
Prof. of Pharmacology of University  
of Medicine and Dentistry of New  
Jersey (Princeton, NJ)

### Project

New therapeutic indication for 5 existing generic drugs. Effectiveness in normostenic mice and mice with alimentary obesity is shown in long-term experiment at Jackson Lab (California). The Group plans to out-license patents for development of the drugs for medical and veterinary use.

### Potential advantages

- High effectiveness – both curative and preventive
- Safety (experience of long-term use in people)

### Project stage

- As all 5 drugs are well researched and have been used in people for many years, the Project can be developed from phase II clinical trials.
- Application for a provisional US patent submitted

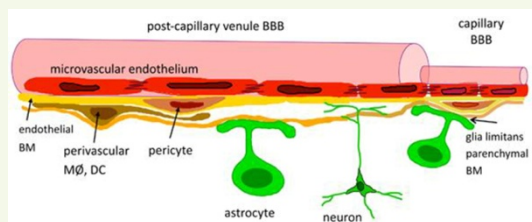
### Financing

- Financing needs are \$0.5m for preliminary tests in human in Russia
- Tests results is expected in 6 months after the start

# BBB, BRAIN-BLOOD BARRIER PROJECT

Very promising Project (in case of success, the product will be a mega-hit!)

New Project,  
fundamental  
research stage



Robert Nagele, Prof. of Cell Biology of Medicine and Dentistry of New Jersey, author of 25 articles in peer reviewed journals

## Project

Project is based on the hypothesis that all neurodegenerative diseases as well as atherosclerosis are caused by weakening of Blood-Brain Barrier (BBB), namely by appearance of gaps between endothelial cells in brain vessels as well as by lack of stem cells to replace endothelium. BBB breakage might be caused by aging, diet, drugs, etc.

## Potential advantages

- New platform for development of drugs for Alzheimer's disease, other neurodegenerative diseases and atherosclerosis as well as for respective test-systems

## Project stage

- In 2012-2014, it is planned to verify the hypothesis and reveal molecules that can strengthen BBB. Then, submit patents and start developing a drug strengthening BBB – the drug can become a new 'statin' preventing numerous diseases.

## Financing

- Financing needs are \$2.2m for 3 years (of which, \$1.1m for equipment and establishing the lab)
- Rostock Group to be a co-investor

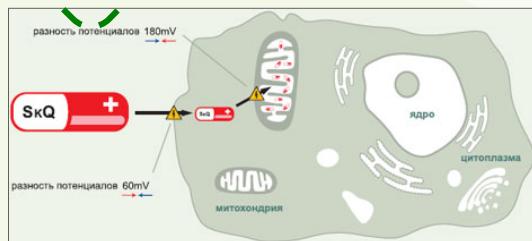
Projects that can result in  
fundamental breakthroughs

**Projects that can lead to new drugs  
and diagnostics**

Other projects

# SKULACHEV IONS

Current project,  
phase II clinical  
trials



Head scientist – Dr. Vladimir Skulachev, member of Russian Academy of Sciences, Professor of Lomonosov Moscow State University, Dean of Bioinformatics and Bioengineering School of MSU, Director of Belozersky Institute of Physical and Chemical Biology

## Project

SkQ1 molecule developed by Dr. V.P.Skulachev is capable of addressed delivery of anti-oxidants to mitochondria. Eye drops for glaucoma, cataract, macular degeneration, dry eye, etc are developed. Also, tablets for heart diseases are planned to be developed.

## Potential advantages

- High effectiveness (both curative and preventive)
- Database of preclinical data demonstrating that eye drops can reverse the development of organic lesions of the eye
- Safety

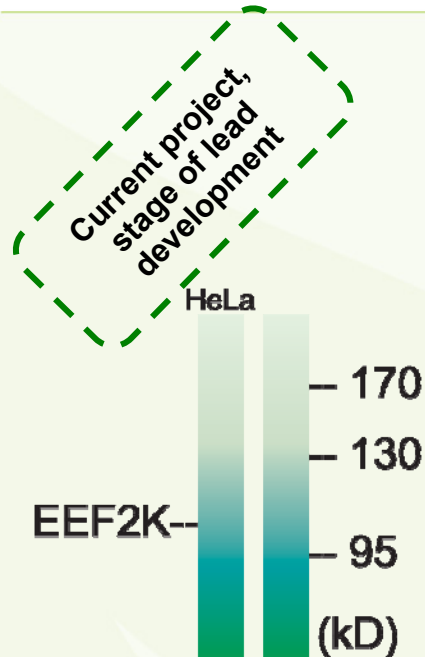
## Project stage

- Industrial and pharmaceutical formulations for eye drops developed
- Numerous Russian and PCT patents
- Phase I clinical trials successfully completed in Russia.
- Phase II clinical trials started in Russia
- IND-application for eye drops trials is prepared in the US

## Financing

- Rostock Group is ready to sell its share in the Project as the Project has advanced beyond the Group's strategic scope (from the search stage to the technical one)
- Financing needs of \$40m for 6 years are provided by a syndicate of investors, incl. RusNano and a wealthy Russian. Application is submitted to Skolkovo Fund.
- The result of the Project is marketing approval for eye drops in Russia and the US as well as completion of phase II clinical trials of the tablet in the US

# LONGEVICA, RADIOPROTECTION DRUG



Head scientist – Dr. A.Ryazanov,  
Prof. of Univ. Medicine and Dentistry  
of New Jersey, Inst. of Protein, MSU

## Project

Drug for protection of healthy cells in radio- and chemotherapy of malignant tumors. The drug is developed on the basis of Eukaryotic elongation factor-2 kinase (eEF2K)

## Potential advantages

- High degree of protection of healthy cells from harmful effects of radio- and chemotherapy of malignant tumors. No protection effects on cancer cells.
- Low toxicity
- Universality (most tumors)
- For indication of civilians protection in 'dirty' terrorist attacks, no need for clinical trials

## Project stage

- Effectiveness and safety shown in numerous experiments in mice
- Numerous international and US patents
- Search for a lead

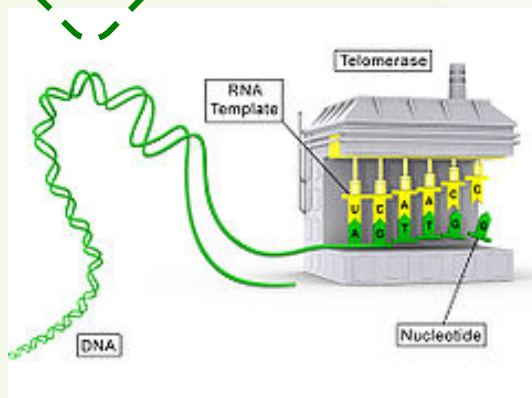
## Financing

- Financing needs are \$1.6m for 2 years to complete the search for and optimization of a lead as well as development of industrial and pharmaceutical formulations

# TELOMERE COMPLEXES

## Research of new DNA structures that might control aging, based on the concept of Dr. A.Olovnikov

Current project,  
fundamental  
research stage



Head scientist - Dr. Olga Dontsova,  
corresponding member of Russian  
Academy of Sciences, Head of  
Natural Compounds Dept. of MSU

### Project

Research of other than telomeres structures of telomere complexes that might impact aging. Certain part of internal telomere repeats can be associated with disruptions in DNA chain. The disruptions survive through cell phases and are repaired in replication. In differentiated cells, if telomerase not present, repeats can be lost. These losses might result in aging.

### Potential advantages

- Revealing new structures and functions in the apparatus of regulation of generic material will allow developing new drugs, first of all for cancer, on the new platform

### Project stage

- New DNA structures revealed (possibly, responsible for telomerase shortening and leading to aging)

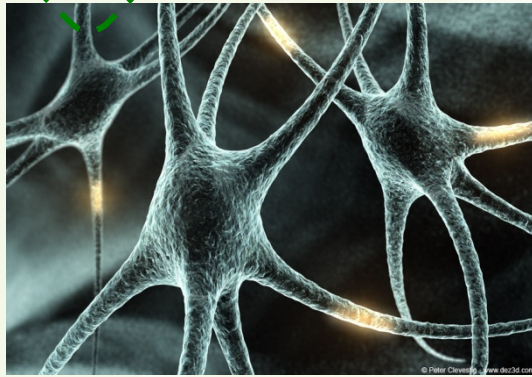
### Financing

- Financing needs are \$2m for 3 years to verify the hypothesis and design leads
- Project submitted for grants of Skolkovo Fund



# REVEALING GENES OF ALZHEIMER'S DISEASE

Current project,  
fundamental  
research stage



Head scientist - Dr. Eugene Rogaeв, Prof. of University of Massachusetts and Institute of General Genetics (Moscow, Russia), discoverer of 2 out of 3 known Alzheimer's disease genes

## Project

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Comparative deep DNA sequencing of genomes of 100 patients with Alzheimer's disease and 100 healthy centenarians to reveal unknown genetic factors of the disease and develop diagnostic DNA test-systems as well as drugs.

## Potential advantages

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- Revealing new genetic targets to develop new drugs and test-systems
- Possibility of early diagnostics and prognosis of high risks of Alzheimer's diseases in significantly greater number of cases and with higher reliability than in existing test-systems

## Project stage

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- Most powerful sequencer Illumina HiSeq 2000 acquired
- Library of DNA samples collected

## Financing

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- Financing needs are \$1m for 2 years to reveal new genes and genetic targets



# BALDNESS DRUG

New Project, stage  
of lead  
development

LIPH gene



Head scientist - Dr. Eugene Rogaeu,  
Prof. of University of Massachusetts  
and Institute of General Genetics  
(Moscow, Russia)

## Project

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Commercialization of recently discovered gene of baldness and substances that are coded by this gene. The objective is to develop a drug for system or topical use for prevention and treatment of alopecia. It was also shown that substances coded by the gene can significantly accelerate healing of wounds and skin ulcers.

## Potential advantages

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- Only drug for baldness that is based on genetic platform

## Project stage

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- Gene and substances coded by the gene revealed
- US patent received

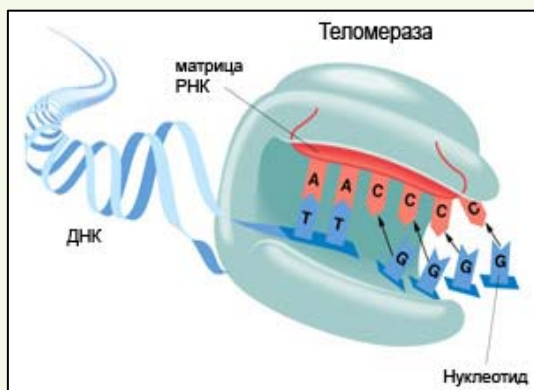
## Financing

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- Financing needs are \$2m fir 3 years for preclinical trials
- Rostock Group to be a co-investor

# TELOMERASE PROJECT TO DEVELOP ANTICANCER DRUG

New Project, stage  
of lead  
development



Head scientist - Dr. Olga Dontsova, corresponding member of Russian Academy of Sciences, Head of Natural Compounds Dept. of MSU

## Project

Developing anti-tumor drug based on thyogidantoin derivates, inhibitors of reverse transcriptase

## Potential advantages

- High selectivity to tumor cells
- Tumor cells destroyed by inducing apoptosis
- Universality (90% of tumors)
- Low molecular weight
- Simple synthesis
- Low toxicity. Therapeutic dose lower than in the only currently developed telomerase inhibitor Grn167 of Geron

## Project stage

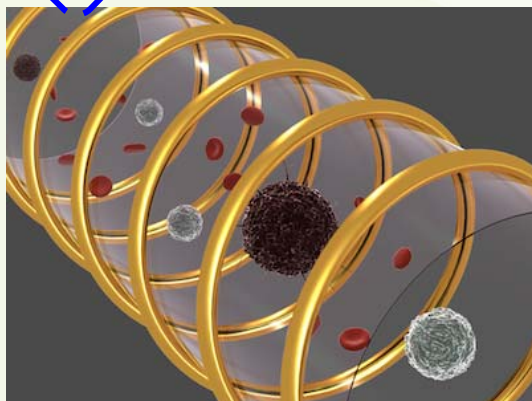
- Substance inhibiting telomerase synthesized
- Provisional patent submitted
- The molecule has higher inhibiting activity than most known telomerase inhibitors (incl. AZT-inhibitor of reverse transcriptase)
- Lead optimization

## Financing

- Financing needs are \$0.55m for 2 years to complete the lead optimization and develop industrial and pharmaceutical formulation

# EARLY DIAGNOSTICS (Alzheimer's disease and other neurodegenerative diseases)

New Project, stage  
of clinical trials



Robert Nagele, Prof. of Cell Biology of Medicine and Dentistry of New Jersey, author of 25 articles in peer reviewed journals

## Project

Project is based on Dr. Nagele's research. Test-system for Alzheimer's disease completed and tested. It is planned to complete the development of several more test-systems, start their marketing in Russia and out-license for marketing in the world.

## Potential advantages

- Test-systems are based on new technological platform

## Project stage

- Test-system for Alzheimer's diseases is developed and tested. In 2011, respective press note released
- Development of test-systems for Parkinson's and other diseases continues

## Financing

- \$1m grant is expected to complete 2 more test-systems
- Additional financing needs are \$2m for 3 years to complete the development of systems, start marketing in Russia and out-license for the world marketing
- Rostock Group to be a co-investor

# EARLY CANCER DIAGNOSTICS

New Project, stage  
of clinical trials



Robert Nagele, Prof. of Cell Biology  
of Medicine and Dentistry of New  
Jersey, author of 25 articles in peer  
reviewed journals

## Project

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Project is based on Dr. Nagele's research. Early cancer diagnostics are based on data that depending on a type of cancer certain types of proteins are produced. It is planned to complete the development of several test-systems, start their marketing in Russia and out-license for marketing in the world.

## Potential advantages

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- Test-systems are based on new technological platform

## Project stage

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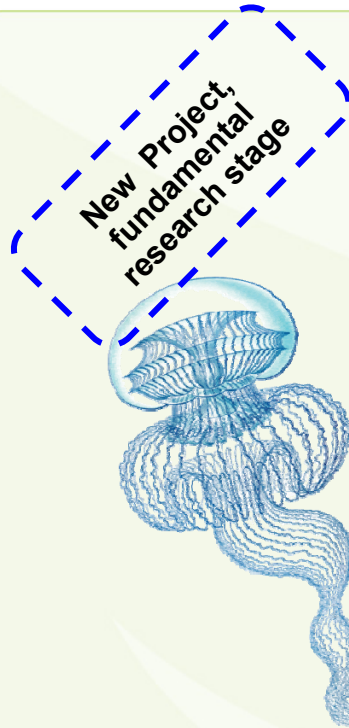
- Breast cancer test-system developed
- Test-systems for other cancers continues

## Financing

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- Additional financing needs are \$2m for 3 years to complete the development of systems, start marketing in Russia and out-license for the world marketing
- Rostock Group to be a co-investor

# PAINKILLERS



Head scientist - Dr. Eugene Rogaeu,  
Prof. of University of Massachusetts  
and Institute of General Genetics  
(Moscow, Russia)

## Project

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To develop a new synthetic painkilling pharma product to treat, for example, chronic neuropathic pain, the team is using complex genomic methods to identify natural toxins of Kindar and Conus species having potential painkilling properties in the human body. 10-50 species of animals to be collected for screening for neurotropic poisons, identification of leads and their chemical synthesis.

## Potential advantages

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- High specificity to pain receptors and afferent neural ends without impact on CNS
- Low toxicity
- Simple synthesis (low-weight peptides)

## Project stage

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- Preliminary research of marine animals done

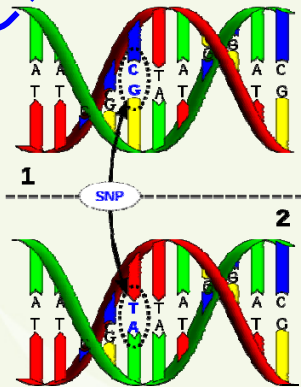
## Financing

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- Financing needs are \$1m for 2 years to create the library of leads
- Rostock Group to be a co-investor

# LONGEVITY GENES REVEALING

New Project,  
fundamental  
research stage



Head scientist - Dr. Eugene Rogaev,  
Prof. of University of Massachusetts  
and Institute of General Genetics  
(Moscow, Russia)

## Project

Comparative deep sequencing of genomes of 100 centenarians and 100 healthy people with average lifespan to reveal longevity genes. These genes can become targets for development of respective drugs and test-systems.

## Potential advantages

- Revealing the basic cause of aging with the opportunity to develop test-systems and design modifying molecules
- Possibility to influence the lifespan
- Direct prognosis of individual's possible lifespan

## Project stage

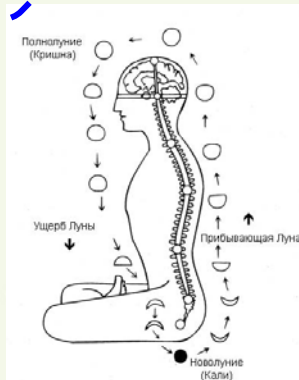
- Most powerful sequencer Illumina HiSeq 2000 acquired
- Library of DNA samples of 100 centenarians collected

## Financing

- Financing needs are \$1.5m for 1.5 years to reveal longevity genes
- Rostock Group to be a co-investor

# LUNASENSOR PROJECT

New Project,  
fundamental  
research stage



Dr. A. Olovnikov, leading scientist of Institute of Biochemistry Physics of RAN. Foreseen the existence of telomeres in 1971

## Project

Identify structural and functional regularities of longer-term cycles in CNS – endocrine system to identify potential targets for modification of ‘internal clocks’ of the human body with the ultimate purpose to prevent age-related diseases. The Project objective is to develop a test-system.

## Potential advantages

- New platform for developing new longevity drugs as well as respective test-systems

## Project stage

- Electronic microscopy research
- Cyclic changes in inclusions in the cells of the pineal gland revealed. A respective article prepared for publishing

## Financing

- Financing needs are \$ 0.5m for 2 years for electronic microscopy and endocrinology research
- Results expected are: targets to develop test-systems and drugs
- Rostock Group to be a co-investor

Projects that can result in  
fundamental breakthroughs

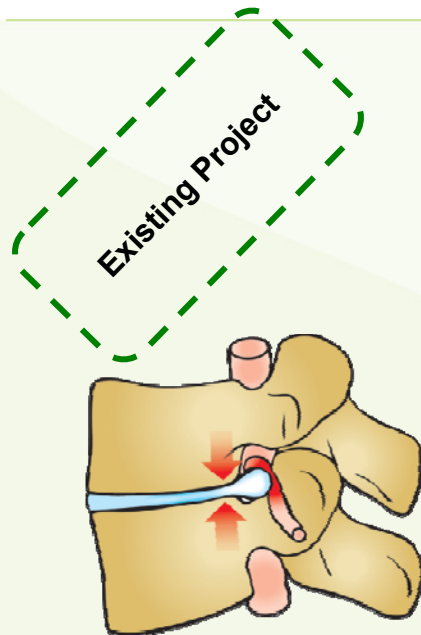
Projects that can lead to new drugs and diagnostics

**Other projects**



# PROGRAM "LIFE WITHOUT RADICULITIS"

## Radical solution to the problem of radiculitis



Head scientist – Dr. A. Nekrasov, winner of national prize "Golden Belt", the founder of the "Healthy Back" Fund

### Project

Revolution in physical education, treatment of disc herniation, rehabilitation, office furniture and so on. Implementation of the method of "protective motor stereotype" developed and tested in clinical practice – individual system for the prevention, diagnosis and treatment of back pain. The method allows to treat and prevent the occurrence, including recurrences of hernial protrusion of intervertebral discs.

### Potential advantages

- High therapeutic and prophylactic efficacy
- Safety
- Simplicity

### Project stage

- The method is fully developed and tested in clinical practice in patients with back pain
- Treatment and methodical center opened
- 8 new athletic programs developed
- Patents received: utility model of new office desk, car and airplane chair, bike and exercise bike
- A monograph, popular science book, is planned for 2012

### Financing

- Financing needs are \$1m for 2 years for awareness and popularization programs

# GENOMICS CENTER, COMMERCIAL GENOME DECODING

New Project



Head scientist - Dr. Eugene Rogaeu,  
Prof. of University of Massachusetts  
and Institute of General Genetics  
(Moscow, Russia)

## Project

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On the basis of the laboratory of Institute of General Genetics, to organize deep sequencing of DNA for research groups and laboratories as well as for individual customers.

## Potential advantages

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- The use of most powerful sequencer will allow to quickly receive reliable results
- Professional team of geneticists

## Project stage

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- Most powerful sequencer Illumina HiSeq 2000 acquired
- Professional team of geneticists
- Genomics Center is organized on the basis of Institute of General Genetics of Russian Academy of Sciences



### **Contact information**

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