**INSTITUTE BIOLOGY AND IMMUNOLOGY OF REPRODUCTION „ACAD. K. BRATANOV“**

BULGARIAN ACADEMY OF SCIENCES

73, Tzarigradsko shose, Sofia 1113

*Director:* prof. Dimitrina Kacheva

# Project:
# REINFORCEMENT OF THE RESEARCH CAPACITY OF THE BULGARIAN INSTITUTE „BIOLOGY AND IMMUNOLOGY OF REPRODUCTION“

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BULGARIAN ACADEMY OF SCIENCES

INSTITUTE BIOLOGY AND IMMUNOLOGY OF REPRODUCTION „Acad. K. Bratanov“

SEVENTH FRAMEWORK PROGRAMME

# ReProForce

FP7-REGPOT-2009-1

## REINFORCEMENT OF THE RESEARCH CAPACITY OF THE BULGARIAN INSTITUTE „BIOLOGY AND IMMUNOLOGY OF REPRODUCTION“

7 partner institutions

Laboratory of Biomedical Embryology – Center for Stem Cell Research, University of Milan, ***Italy*** – *Prof. F. Gandolfi*

Department of Obstetrics at the Friedrich Schiller University, *Jena*, ***Germany*** – *Prof. U. Markert*

Private Hospital for Gynecology, Magdeburg, ***Germany*** – *Prof. H. Donat*

Department of Biological Sciences, University of Essex, *UK*, – *Prof. N. Fernandez*

Human and Animal Physiology Group, Department of Animal Sciences, Wageningen University, *Wageningen*, ***Netherlands*** – *Prof. K. Teerds*

Clinical Department of Reproduction and Animal Breeding, Biotechnology in reproductionq University of Veterinary Medicine, *Vienna*, ***Austria*** – *Dr. U. Besenfelder*

University Clinic for Reproductive Medicine and Gynecologic Endocrinology, *Magdeburg*, ***Germany*** – *Prof. J. Kleinstein*

## PROJECT IDEA

The ReProForce project provides an opportunity for IBIR – BAS to increase its human and technical recourses potential and to tighten its cooperation on both National and Europw-wide scale

## MAIN GOAL

Providing means for improving the research potential of IBIR and reestablishing its leadership position in Southeast Europe in the scientific area of the Biology and Immunology of Reproduction in animals and human

## SPECIFIC OBJECTIVES

- Reinforcement of the Research Capability of IBIR – BAS
- Upgrading the Technological Capacity of IBIR – BAS
- Promoting the National and Inernational recognition of IBIR – BAS within Bulgaria and Southeast Europe, and its integration in the European Research Area

| | |
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| **WP1** | Strengthning the Research capability of IBIR-BAS |
| **WP2** | Improving the technological capacity of IBIR-BAS for research, technical development and inactivity |
| **WP3** | Network building |
| **WP3.1** | Building IBIR-BAS's strategic partnerships |
| **WP3.2** | Organizing of Scientific Meetings and Dissemination of scientific results of IBIR-BAS's research |
| **WP4** | Transparency and recognition of the Project results |
| **WP5** | Management and Coordination of ReProForce |
| **WP6** | Expert Panel Review |


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# ReProForce

FP7-REGPOT-2009-1

REINFORCEMENT OF THE RESEARCH CAPACITY OF THE BULGARIAN INSTITUTE „BIOLOGY AND IMMUNOLOGY OF REPRODUCTION"

**Project start** – 12.2009, **Project duration** – 42 months

**Coordinator and solitary beneficent –**
Institute of „Biology and Immunology of Reproduction"

**Highly competitive project** – among more than **1300 projects** submitted under REGPOT – only **16 funded**

Funding from 7th Framework Program – **BGN 3 000 000**
Co-funding from MES – **BGN 324 030**

Mobility Actions implementied: **27**

Mobility from IBIR: **21**
Senior Researchers: **12**
Junior Researchers: **9**

Mobility to IBIR: **6**
Senior Researchers: **6**


НАРОДЕН ДОМ НА УЧЕНИТЕ
ИК ЖОЛИО-КЮРИ
INTERNATIONAL HOME OF SCIENTISTS
FREDERIC JOLIOT - CURIE


2nd Conference of the Balkan Network for the
Biotechnology in Animal Reproduction

## EVENTS HELD – 26

### ReProForce Partners meetings (3)

- ReProForce Project kick-off meeting: January,26 and 29, 2010
- 2nd ReProForce Partners meeting: February, 20-22, 2011
- 3rd ReProForce Partners Meeting: January, 29-30, 2012

### Organization of days of „Open doors" in IBIR (3)

- October, 27-28, 2010
- November, 29-30, 2011
- November 29-30, 2012

### Organization of scientific events (8)

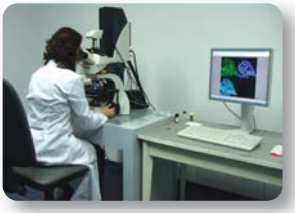
- Workshop „Mitochondria and Reproduction" – Joint Event of FP7 Project ReProForce and COST Actions FA0602. June, 2-3, 2010
- Scientific Seminar „Stem cells as a basis for development of regenerative medicin" – July, 21, 2010
- Training Course Biotechnology of Embryo Transfer in Farm Animals held by Institute of Biology and Immunology of Reproduction in collaboration with Institute of Mountain Agriculture and Stock-breeding, Troyan, Bulgaria. September, 25-28, 2010
- Theoretical seminar on the Problems of proteomics, October, 20, 2010
- 2nd Conference of Balkan Network for Animal Reproduction Biotechnology *„European Achievements in Biotechnology in Animal Reproduction"* and supporting Workshop, March 24-25, 2011
- Immunological problems of human reproduction. November, 5, 2011
- Round Table „Application of contemporary science knowledge in assisted reproduction techniques". March, 31, 2012
- 13th International Symposium for Immunology of Reproduction *„From the roots to the tops of reproductive immunology"* „Fr. Joliot-Curie", International house of scientists, Varna, Bulgaria. June, 22-24, 2012

## Organization of scientific and methodological seminars (10)

- Application of flow cytometry for analysis of cells, 2010
- Application of proteomic analysis methods, 2010
- Sample preparation and image analysis for Leica confocal microscope, 2010
- Application of the spectrophotometric analysis methods, 2011
- 4 Extensive Methodological Seminars represented the new generation of methods, 2011:
  - *Ilumina:* „Presentation of a new generation personal sequencing and microarray analysis with application in a wide range of research and diagnostic practice"
  - *Agilent:* „Contemporary Agilent technologies applied in the field of microarray analysis"
  - *Hitachi:* „A new model of TEM produced by Hitachi"
  - *BioRad:* „Proteomics workflow – discovery of protein world"
- Micromanipulation system and confocal microscope as powerful tools for the oocyte and embryo investigation, 2012
- A theoretical and practical course on „Flow Cytometry", 2012

## UP-GRADE AND ORGANISATION OF 4 IBIR LABORATORIES:

- Laboratory for proteome analysis.
- Laboratory for cell culture, physical and chemical analyses.
- Laboratory for in vitro fertilization and embryo transfer.
- Laboratory for confocal and light microscopy.






## 1. RTDI STRATEGY OF IBIR – BAS

The overall objective of the strategy is to help IBIR – BAS develop further its research potential and become a true player in the European Research Area. It builds on the EU's concept of centres of excellence in research.

Today we still do not have a commonly agreed definition on what a centre of research excellence is. When the European Commission launched a more focused action in support of centres of excellence, the following working definition was proposed:

> *„A centre of excellence is a structure where RTD is performed of world standard, in terms of measurable scientific production (including training) and/or technological innovation".*

Based on this definition and looking at the performance of some European leading centres of excellence some key characteristics of the centres of excellence can be derived:

- High-level, high-standing researchers;
- Having its own research agenda;
- Conducting globally competitive research;
- Multidisciplinarity of research and complementarity of skills;
- High international visibility;
- Strong networking and connectivity with the scientific and industrial communities;
- Dynamic exchange of qualified researchers;
- Stability of funding and diversified financial resources.

The quality of the research of such centres can be measured based on a number of criteria, some of which are:

- scientific publications;
- patents filed;
- post-doc positions offered;
- number of research personnel and visiting scientists;
- number and volume of commercial contracts;
- number of spin-off companies;
- participation in trans-European educational schemes, etc.

## 1.1. Mission of IBIR – BAS

- IBIR – BAS performs fundamental and applied scientific investigations as well as educational activity in the domain of biology and immunology of animal and human reproduction.
- The investigation domain of IBIR – BAS is unique at national level and is dedicated at resolving of social problems like reproductive health, sustainable usage and restoration of natural resources and improvement of quality of life.

## 1.2. Vision of IBIR – BAS for the year of 2025

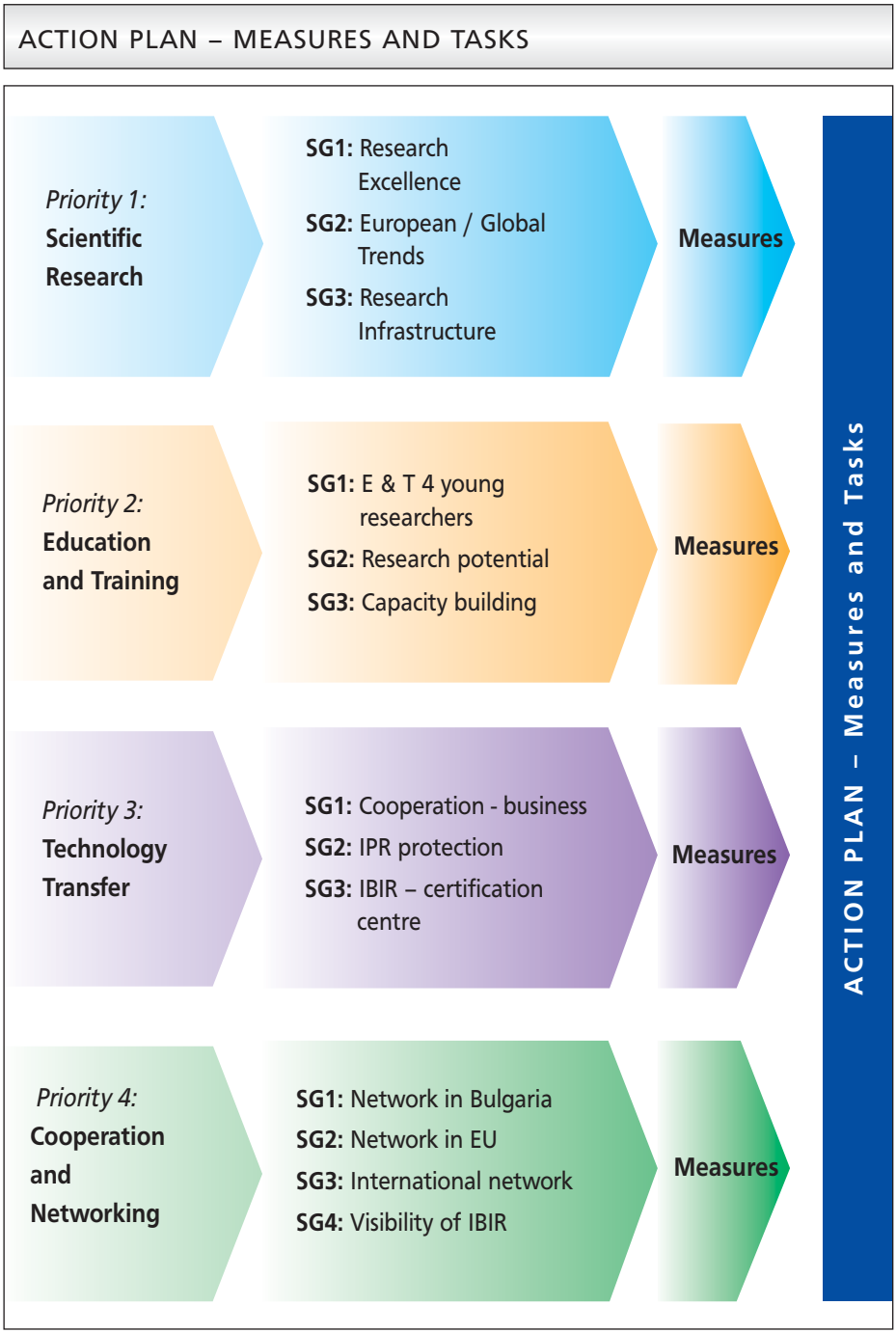
- IBIR – BAS is a well established and recognised European centre of excellence carrying out outstanding research with the ultimate goal to improve reproductive health, and as well is an equally standing partner in scientific research on biology and immunology of reproduction in humans and animals in the European Research Area.

## 1.3. Guiding principles and values

The researchers of IBIR – BAS follow the principles and values spelled out in the European Charter for Researchers, namely research freedom, research ethics and scientific integrity, professional responsibility, professional attitude, contractual and legal obligations (incl. IPR regulations), accountability, good practice in research, dissemination and exploitation of results, public engagement, relation with supervisors of the junior researchers, supervision and managerial duties of the senior researchers, and continuing professional development. The following principles that guide the research work of IBIR – BAS' staff are complementary to the ones presented in the European Charter for Researchers:

- Engagement to social problems related to the reproductive health and food quality and safety in Bulgaria and Europe.
- High quality, interdisciplinary and innovative scientific production
- Dissemination and exploitation of scientific results
- Networking with national, European and international partners.

## 1.4. Organigramme of the RTDI Strategy of IBIR – BAS



## 1.5. Development priorities

*Priority 1:* **SCIENTIFIC RESEARCH**

**Research agenda of IBIR – BAS**

The research activities in IBIR-BAS contribute to different levels of the reproductive cycle of animals and humans *(Figure 1)*. They are concentrated on contemporary issues of high importance to the society and the economy, which require innovative approaches for studying and solving them. The research domain of IBIR corresponds to the National Research Strategy of Bulgaria until 2020 (Priority 2. Health and quality of life, biotechnologies and ecological food) and „Horizon 2020" – the EU Framework Programme for Research and Innovation for the period 2014 – 2020 (Priorities: Health, demographic changes, welfare and Safety food, sustainable agriculture and bio-economy).

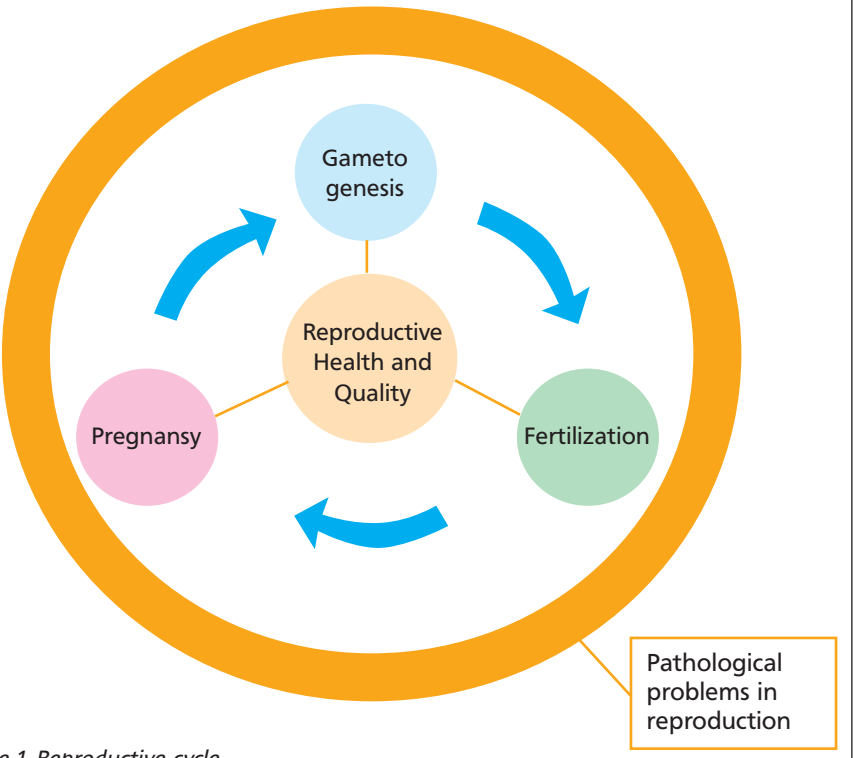



*Figure 1. Reproductive cycle*

## Scientific research priorities of IBIR – BAS

During the last decades the research conducted by IBIR – BAS has reached a new level, namely research in all aspects of reproduction in human and animals at the molecular level. This provides an opportunity for IBIR to contribute to the European research activities under different programmes, on topics related to reproductive health, environmental effects on reproduction and cryopreservation of the reproductive cells and tissues. The enhancement of molecular research results both into deepening of fundamental research, as well as into the development of innovative products with applications in the human and animal medicine and animal husbandry. The research agenda of IBIR in the field of human and animal reproduction corresponds to the Strategic Research Agenda of FABRE-TP and to the European and global scientific priorities related to overcoming the infertility and thus can achieve significant impact on the society as a whole.

The current research agenda of IBIR is as follows:

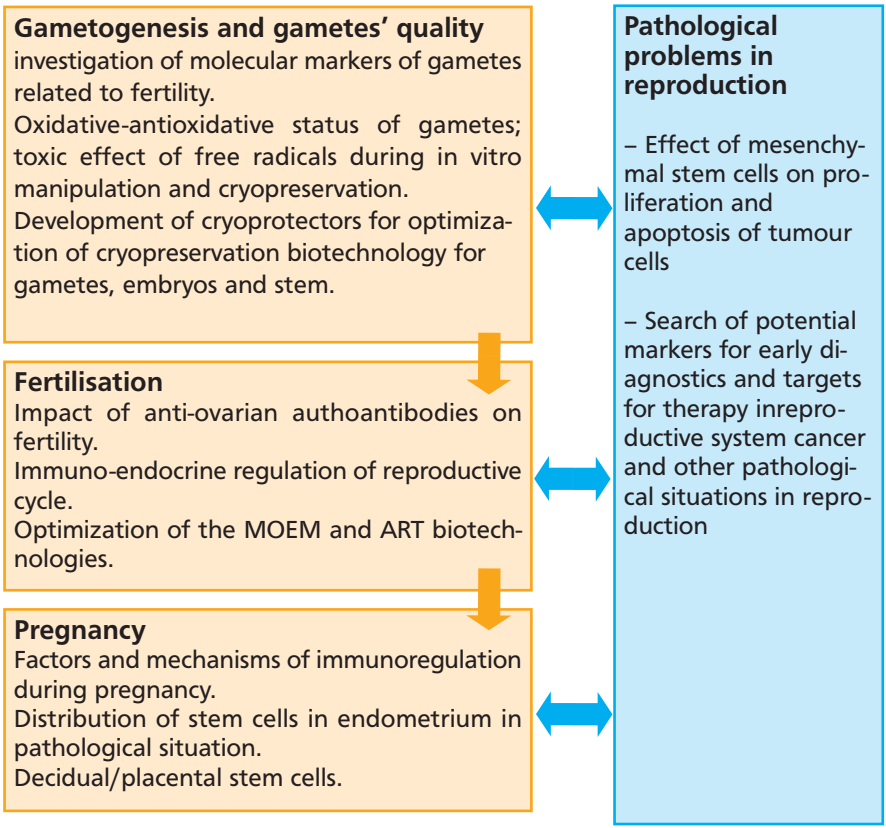



*Figure 2: Organigramme of IBIR's research priorities*

The strategic goals and the measures for their attainment are derived from the overall analysis of the research activities of IBIR, and take into account the findings from the questionnaire-based surveys and workshops (Jan – Feb 2013).

| Strategic Goals | Performance Indicators |
|---|---|
| *Strategic Goal 1:* **Excellence in fundamental and applied research.**<br><br>*The definition commonly agreed by the IBIR's research staff is*<br><br>***„Research excellence means competitive research in human and animal reproduction at the European and the international levels".***<br><br>This goal will be achieved through a variety of concrete measures:<br>• **M1** – Development of national, European and national research projects, as well as participating in such projects as a partner; setting up an in-house structural unit to monitor the calls for proposals and the programmes of relevance to the research agenda of the institute;<br>• **M2** – Contracts with businesses/ associations and IVF clinics for the implementation of joint research projects;<br>• **M3** – Publication of articles in IF journals;<br>• **M4** – Mobility of researchers. This measure will target both outward and inward mobility of researchers for exchange of highly qualified staff with European and international high-standing research organizations;<br>• **M5** – Recruitment of post-docs. | **M1**<br>Number of project applications/ Number of signed grant agreements<br>Financial value of the contracted projects/Implementation of the budgets<br>Number of master students with diploma projects defended on the research topics of the projects<br>Number of PhD fellows working on the projects and number of PhD fellows with successfully defended research theses<br>Setting up a new in-house structural unit and members of staff of this unit<br><br>**M2**<br>Number of contracts and financial value of the contracts<br><br>**M3**<br>Number of publications in IF journals<br><br>**M4**<br>Number and duration of staff exchanges of highly qualified researchers<br><br>**M5**<br>Number of new post-docs on an employment contract |

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|---|---|
| *Strategic Goal 2:* **Correspondence of the research areas of IBIR – BAS with (i) the European and global trends in the area of human and animal reproduction as well as with (ii) the societal needs of the national and European economy.**<br><br>The attainment of this goal will be achieved through different types of measures, which will allow for monitoring the European and global developments in human and animal reproduction:<br><br>• **M6** – Participation in scientific events – congresses, conferences and workshops with the aim to present the outcomes of ongoing research as well as to learn about the research achievements of similar research organisations both from Europe and outside Europe;<br><br>• **M7**– Membership in different networks and scientific societies; participation in EU programmes focused on the regional development and regional cooperation in order to monitor the needs of regional and European stakeholders;<br><br>• **M8** – Surveys of national stakeholders with the aim to monitor the changing demand for scientific advice and research collaboration with IBIR – BAS, as well as surveys of prospective European partners in order to keep up-to-date the research agenda of the institute. | **M6**<br>Number of events in which the research staff have participated<br>Number of presented research reports and posters<br><br>**M7**<br>Number of memberships of the institute<br>Number of staff who are members in different scientific organisations<br>Number of projects under the EU programmes for regional development<br><br>**M8**<br>Number of surveys and number of respondents per survey<br>Analysis of the findings and recommendations in the surveys. These will serve as an input for updating the development strategy and the research agenda of the institute.<br>Recommendations from the surveys which have been implemented<br>Update of the research agenda and strategy, and the corresponding action plan |
| *Strategic Goal 3:* **Modern research infrastructure.**<br><br>According to the EU definition, „the term 'research infrastructures' refers to facilities, resources, systems and related services that are used by research communities to conduct toplevel research in their respective fields. This definition covers: major scientific equipment or set | **M9**<br>Number of applications for research infrastructure projects<br>Number of items of new research equipment |

of instruments; knowledge-based resources such as collections, archives or structured scientific information; ICT-based e-Infrastructures (networks, computing resources, software and data repositories) for research and education; any other entity of a unique nature essential to achieve or enable excellence in research. Research infrastructures may be 'single-sited' or 'distributed' (a network of resources).”

The **measures** foreseen for the attainment of this goal fall into two groups:

***Group 1.*** *Measures for optimising and further expanding the existing research infrastructure of IBIR – BAS:*

- **M9** – preparation of projects to the relevant RTDI and Structural Funds programmes for the upgrade and expansion of the currently existing research infrastructure;
- **M10** – inviting companies – producers and importers of research equipment – to make presentations on the contemporary research laboratory equipment;
- **M11** – access to online resources and subscription to relevant scientific journals.

***Group 2.*** *Measures for accessing European-level research infrastructures of larger scale which are deemed necessary for the conduct of scientific research:*

- **M12** – Review of the roadmap on European research infrastructures and launching actions for getting access to those research infrastructures, which are relevant for the purposes of the research work of the Institute.

**M10**
Number of presentations by leading companies – producers and importers of research equipment

**M11**
Number of subscriptions to scientific journals
Subscription and access to online resources

**M12**
Access to European research infrastructures – projects and contracts

*Priority 2:* **EDUCATION AND TRAINING IN THE AREA OF BIOLOGY AND IMMUNOLOGY OF REPRODUCTION EMPLOYING THE LIFE-LONG LEARNING APPROACH**

The measures foreseen under this priority will be jointly implemented with national and European/international research partners, and will be focused on supporting the career development of young researchers with high research potential on the one hand, mobility of senior researchers, as well as on enhancing the qualifications of the staff for their research and practical activities. Before working out the education and training programme for each calendar year, the management of IBIR – BAS will conduct a training needs assessment in November of the preceding year. The measures will address both young and experienced researchers, as well as encompass specialised trainings for developing of generic skills like research and innovation management and presentations skills. The strategic goals and the measures proposed for their attainment build on the questionnaire-based survey of the research staff and the follow-up discussion in February 2013.

| **Strategic Goals** | **Performance Indicators** *(on an annual basis)* |
|---|---|
| *Strategic Goal 1:* **Education and training to support the career development of young researchers – focus on MSc students and PhD fellows**<br><br>The **measures** will aim to attract and retain young people to science and the profession of the researcher. The following measures are in the focus of IBIR-BAS:<br>• **M13** – Development and implementation of joint interdisciplinary programmes for masters' students as well as PhD programmes. Of special interest here are the 'Marie Curie' actions within Horizon 2020 (Action 1), as well as the opportunities of 'Erasmus for All' for the international level activities. At the national level the opportunities of the National Science Fund for launching such programmes will be explored;<br>• **M14** – Opening new research positions for young scientists – PhD fellows. This will be of crucial | **M13**<br>Number of interdisciplinary programmes and projects<br>Volume of funding<br><br>**M14**<br>Number of enrolled PhD fellows<br>Number of PhD fellows successfully completed their PhD thesis<br>Number of employment contracts for PhDs<br>Number of enrolled masters'<br>Number of successfully graduated masters<br>Number of jobs for graduated masters<br><br>**M15**<br>Number of specialised trainings and summer schools<br><br>**M16**<br>Number of internal trainings for young researchers |

importance for the future of the institute. Such positions can be opened on a temporary basis in the beginning, under research projects, and then be transformed into positions on an employment contract;

- **M15** – Organisation of specialised training seminars and summer schools jointly with European and Bulgarian partners;
- **M16** – Work with the young researchers – organisation of internal trainings, with lecturers from the senior research staff of IBIR – BAS and the national partners (universities and other research institutes).

*Strategic Goal 2:* **Enhancing the research potential of the scientists of IBIR – BAS on an ongoing basis**

The measures foreseen under this strategic goal are the following:

- **M17** – Participation in projects under Action 2 of Marie Curie Actions/ Horizon 2020 (Support for Experienced Researchers Undertaking Mobility) as well as in the relevant mobility schemes of the National Science Fund;
- **M18** – Networking/twinning with leading research entities in Europe and signing of cooperation research agreements;
- **M19** – Recruitment of experienced researchers in the research area of IBIR-BAS;
- **M20** – Training on new research methodologies. Participation in events organised by other research organisations and universities in Bulgaria and abroad.
- **M21** – Events – open days, conferences/congresses and work-shops – organised by IBIR – BAS

**M17**
Number of Marie Curie projects
Number of Erasmus for All projects
Number of projects supported by the National Science Fund
Volume of funding

**M18**
Number of cooperation agreements

**M19**
Number of recruited experienced researchers

**M20**
Number of trainings on new research methods/methodologies
Number of lectures by in-house professors and ass. professors
Number of invited lecturers
Number of participants in the events

**M21**
Number of scientific events organised by IBIR – BAS
Number of participants in the events
Programmes of the events

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| *Strategic Goal 3:* **Capacity building on research and innovation management**<br><br>The measures for the attainment of this goal aim to strengthen the capacity of IBIR towards effective management of its research and innovation activities. Technology and knowledge transfer to practical applications is a highly-skilled area requiring diverse and multifaceted expertise. The lack of such capacities might limit the practical applications of research achievements and hence, the societal benefits. The following measures, foreseen under this goal, encompass both trainings organised for the institute and trainings of other organisations, where the research staff can participate, as well as national-level trainings:<br>• **M22** – Participation in programme-focused trainings on the EU programmes in the period 2014-2020;<br>• **M23** – Participation in project and financial management trainings;<br>• **M24** – Participation in trainings on how to build research partnerships;<br>• **M25** – Participation in trainings on technology transfer and IPR protection | **M22**<br>Number of trainings<br>Number of participants from IBIR<br>Effects from the trainings in terms of project applications and projects approved for funding<br><br>**M23**<br>Number of trainings<br>Number of participants from IBIR<br><br>**M24**<br>Number of trainings<br>Number of participants from IBIR<br><br>**M25**<br>Number of trainings<br>Number of participants from IBIR |

*Priority 3.* **TECHNOLOGY TRANSFER**

Given the societal importance of the research carried out by IBIR – BAS for both the human and veterinary medicine, the transfer of the research achievements into practical applications will be of high priority in IBIR's future activities. Technologies and new methods are developed in collaboration with business partners. These development processes can be rather expensive. This is why the transfer of knowledge and technologies into practical applications is the natural end of each scientific research. But it also demands a really proactive approach by committed people, since it engages the researchers and the business partners at the same time. Technology transfer activities will be highly beneficial to IBIR, since they will increase the visibility of the institute and increase the credibility of its scientific research.

| **Strategic Goals** | **Performance Indicators** *(on an annual basis)* |
|---|---|
| *Strategic Goal 1:* **Strengthening the cooperation with the businesses**<br><br>The attainment of this goal will be achieved through the following measures:<br>• **M26** – Monitoring of the business needs. This will be achieved through periodical inquires through online survey as well as through regular meetings with business representatives;<br>• **M27** – Awareness among the business community on the research topics of IBIR – BAS and the research results with high potential for practical applications. The tools to raise awareness are: days of open doors, scientific exhibitions, round table discussion, information days to alert the business community of the scientific achievements of IBIR;<br>• **M28** – Contracts with businesses/ associations and IVF clinics for the provision of scientific services – on demand by the businesses.<br>• **M29** – Establishing an Advisory Board of stakeholder representatives incl. foreign renowned researchers. All | **M26**<br>Number of meetings with business representatives<br>Number of surveys of the needs of the businesses in animal reproduction and health reproduction<br>Feedback and update of the strategy and the corresponding action plan<br><br>**M27**<br>Number of information days<br>Number of open doors days<br>Number of round table discussions<br>Number of exhibitions<br><br>**M28**<br>Number of signed contracts<br>Number of staff of IBIR working on the contracts<br>Value of the contracts<br>Number of methods/methodologies transferred to practical applications<br><br>**M29**<br>Mandate of the advisory body<br>Members of the advisory board<br>Meetings and recommendations |

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| members the board will be external experts.<br>• **M30** – Including 2 business representatives in the Research Council of IBIR – one from animal reproduction and one from human reproduction. These representatives will work on 2-year mandates, according to the action plans for the implementation of the strategy. | **M30**<br>Mandate of the business representatives in the Research Council of IBIR<br>Members – names and short bios plus justification on their selection |
| *Strategic Goal 2:* **IPR protection**<br><br>• **M31** – Inventory of the research achievements of IBIR from the last 5 years (2008-2012) and assessment of their potential for practical applications. For the purpose a team of experts from research and industry will have to be established with the mandate to assess the practical applicability of the research results before proceeding to patent applications.<br>• **M32** – Patent applications. | **M31**<br>Team of experts to assess the practical applicability of IBIR's research achievements<br>Inventory of research results with application potential<br><br>**M32**<br>Number of patent applications |
| *Strategic Goal 3:* **IBIR – BAS to become a centre with certification functions for export and import of genetic material (semen, oocytes and embryos) in Bulgaria.**<br><br>• **M33** – Coordination of laboratory certification with governmental bodies<br>• **M34** – Certification of Laboratory for the quality assessment of gametes and embryos | **M33**<br>Agreement signing<br><br>**M34**<br>Number of contracted analyses for certification<br>Financial value of contracts |

*Priority 4.* **ENHANCING THE RESEARCH AND INNOVATION COOPERATION AND NETWORKING IN THE COUNTRY AND ABROAD**

IBIR will carry out its research activities in close collaboration with academic and business partners from the country and abroad. This encompasses conducting joint research, joint research projects under national and European programmes, joint organisation and joint participation in seminars and conferences. This priority and its measures are also meant to improve the dialogue between researchers, policy makers and business partners. The measures are of horizontal nature, i.e. they are designed to support the attainment of the strategic goals of the preceding 3 priorities.

| **Strategic Goals** | **Performance Indicators** *(on an annual basis)* |
|---|---|
| *Strategic Goal 1:* **Expanding the partnership network in Bulgaria and strengthening the social-oriented research**<br><br>Measures:<br>• **M35** – Active cooperation with the research and innovation partners in Bulgaria through trainings organised by the staff of IBIR<br>• **M36** – Expanding the research cooperation with new research topics and attracting new research partners<br>• **M37** – Development of joint working plans and regular meetings to update the joint working plans | **M35**<br>Number of partners<br>Number of trainings organised for the national-level partners<br>Number of participants<br><br>**M36**<br>New research topics based on the demand of the national partners<br>New research partners<br><br>**M37**<br>Number of meetings per annum<br>Number of participants<br>Joint working plans and their implementation |
| *Strategic Goal 2:* **Expanding the partnership network in EU**<br><br>Measures:<br>• **M38** – Expanding the research cooperation with new research topics and attracting new research partners in EU<br>• **M39** – Bilateral research agreements<br>• **M40** – Membership in international research networks | **M38**<br>New research topics based on the demand of the EU partners<br>New research partners<br><br>**M39**<br>Signed bilateral research agreements<br><br>**M40**<br>List of memberships |

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| • **M41** – Establishing cooperation with the European Food Safety Agency for the development of research projects related to the assessment of food quality effect on the reproductive health | **M41**<br>Number of successful projects |
| *Strategic Goal 3:* **Building a network of international organisations**<br><br>Measures:<br>• **M42** – Development of research collaboration with non-EU research organizations and universities | **M42**<br>Number of joint project proposals<br>Number of signed contracts<br>Volume of funding |
| *Strategic Goal 4:* **Visibility of IBIR – BAS through promotion and advertising**<br><br>Measures:<br>• **M43** – Reconstruction, re-design and ongoing maintenance of the web-site of IBIR in Bulgaria and in English<br>• **M44** – Visibility of IBIR in the social media: FaceBook, Twitter, LinkedIn<br>• **M45** – Annual promotional plan as an integral part of the Action Plans for the implementation of the RTDI strategy | **M43**<br>New/upgraded web-site<br><br>**M44**<br>Presentations of IBIR in FaceBook, Twitter, LinkedIn. Maintenance of the institutional profile<br><br>**M45**<br>Annual promotional plans with concrete tasks and time-frame |

## 1.6. Implementation of the strategy

The strategy covers the period June 2013 – December 2020. The strategy will be implemented through bi-annual action plans as follows:

*First Action Plan* – June 2013 – December 2014
*Second Action Plan* – January 2015 – December 2016
*Third Action Plan* – January 2017 – December 2018
*Forth Action Plan* – January 2019 – December 2020

Each action plan has the following main elements: the measures to be implemented during the period of the action plan, the staff in charge of organising the implementation of each measure and the resources for the implementation of the action plan. The action plans are concrete and they present a coherent and logical programme of action. Each action plan can cover in full or encompass the implementation of a sub-set of the measures from the RTDI strategy. This is the management team of IBIR – BAS who is in charge of working out the annual reports on the implementation, as well as the action plans for each bi-annual period. The strategy itself will be reviewed in the end of each calendar year as well, and if necessary – updated based on identified emerging issues and needs of stakeholders, partners and staff.

## 1.7. Financial resources for the implementation of the strategy

By the time of working out the strategy the major funding comes from the annual budget subsidies for the regular salaries of the research and administrative staff and the maintenance of the building. Taking into account that the RTDI strategy is highly ambitious, the common understanding of IBIR's staff and management is that the implementation of the strategy and the action plans should rely on funding on a competitive basis through participation in national, European and international programmes. Given that the time of developing the strategy and its first action plan is in a period (first half of 2013) when most of the EU programmes have closed all calls for proposals, and the programmes of the new funding period 2014-2020 are just before opening, this part of the strategy will be worked out in detail in January 2014, when it is expected that all working programmes will be published and there will be information available on their funding priorities and instruments.

**Impact**

Considering the social importance of research conducted by IBIR – BAS, as well as the high relevance of it to both human and veterinary medicine, the transfer of knowledge and research results into the practice will be the top priority for IBIR – BAS in the coming years. New technologies and methods developed in partnership with business and research partners will be crucial for IBIR's development, since they will bring not only additional expertise to the institute but will increase as well its visibility and credibility among business and society at the large.

Through diversifying its research agenda and developing also its innovation potential IBIR – BAS strives to become by the year of 2020 an important and renowned research centre in the field of human and animal reproduction in the European Research Area.

Following the priorities of its RTDI strategy IBIR – BAS will manage to concentrate its efforts on enhancing its research activities and improving the overall performance of the educational activities as well.

The implementation of the strategy will allow for strengthening the research capacity of the institute through interdisciplinary PhD programmes and the recruitment of qualified young researchers. The strong competition at both the national and European levels demands from scientists to be at the same time good researchers and good research managers. This is why the strategy has such a priority, which is focused on developing the complementary skills of the research staff, like research and innovation management, knowledge on IPR, technology transfer.

The implementation of the strategy will also help IBIR – BAS to considerably expand its partnership networks not only in Bulgaria, but in the European Union and internationally as well.

The attainment of the strategic goals will help IBIR – BAS to become a centre of excellence in its scientific domain with:

- ImpactContemporary research agenda.
- Multidisciplinarity of research and complementarity of skills.
- High-level and high-standing researchers.
- Conducting competitive research.
- High international visibility.
- Strong networking and connectivity with the scientific and business communities.
- Dynamic exchange of qualified researchers.
- Stability of funding and diversified financial resources.

INSTITUTE OF BIOLOGY AND IMMUNOLOGY OF REPRODUCTION „CAD. KIRIL BRATANOV"

**RTDI STRATEGY 2020**

**FIRST ACTION PLAN 2013-2014**

| Tasks | Activities | Responsible | Timeline |
|---|---|---|---|
| *Priority 1:* **Scientific research** | | | |
| *Strategic Goal 1:* **Excellence in fundamental and applied research** | | | |
| **Measure 1**<br>**Task 1.** *Organisation of research investigations on the following topics / directions:*<br><br>GAMETOGENESIS AND GAMETES' QUALITY<br>Morphological characteristic of sperm and spermatozoid-specific proteins and enzymes, related to fertilizing ability.<br><br>Oxidative-antioxidative status of sperm from different species; toxic effect of free radicals in cryopreserved sperm.<br><br>Role of seminal plasma proteins in adaptation capabilities of spermatozoa stored at low temperatures.<br><br>Biomarkers for selecting oocytes in program for in vitro fertilisation. | • Coordinators and Principal investigators of each problem are to be appointed among the scientists from IBIR;<br><br>• Teams on each problem /direction/topicto be appointed;<br><br>• To define the leading investigators working under the corresponding topic on the base of publications;<br><br>• To prepare thematic projects for submission to different programs at national, regional and European level in accordance to announced calls. | Scientific Secretary<br>Chairperson of the Scientific Council<br><br>Heads of departments<br><br>Senior scientists | Until the end of 2014<br><br>In the first semester of 2014, after opening the first calls for proposals under „Horizon 2020" program |

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| Effect of biological active food supplements on ovary activity and on gametes' quality in females and males.<br>FERTILISATION<br>Impact of anti-ovarian antibodies on fertility.<br>Immuno-endocrine regulation of luteinisation and apoptosis in preovulatory folicle.<br>PREGNANCY<br>– Factors and mechanisms of immunoregulation during pregnancy;<br>– Distribution of stem cells in endometrium in pathological situation;<br>– Decidual/placental stem cells.<br>PATHOLOGICAL PROBLEMS IN REPRODUCTION<br>– Effect of mesenchymal stem cells on proliferation and apoptosis of tumour cells;<br>– The role of metalloproteinases in pathogenesis of breast cancer and their significance as prognostic markers for early diagnosis of disease; | | | |

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| – Gene regulatory networks based on siRNA, transcription factors and fusion oncoproteins in prostate cancerogenesis.<br>Studies on cytotoxicity of porfirin compounds on PC3 cell line.<br>To intensify the studies related to the influence of the environment in accordance to the last European initiative „Farming, safety of foods and climate changes". | | | |
| **Measure 3**<br>**Task 2.** *Strengthening of the expert activity of the scientists from IBIR* | Participation in editorial boards of scientific journals in the country and abroad.<br>Active participation in activities related to referee of scientific papers.<br>Active participation in experts committees to different governmental institutions and organs. | Senior scientists | During the whole period |
| *Strategic Goal 2:* **Correspondence of the research areas of IBIR – BAS with (i) the European and global trends in the area of human and animal reproduction as well as with (ii) the societal needs of the national and European economy** | | | |
| **Measure 6**<br>**Task 3.** *Participation in national and* | Participation in the following national scientific meetings:<br>– Veterinary Faculty of LTU; | Authors of oral reports and posters | November 2013<br>November 2014<br>March 2014 |

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| *international scientific meetings* | – Congresses of BASRH;<br>– National Conference of immunology.<br>Participation in international meetings:<br>– Annual conference of ESDAR;<br>– International symposium on the problems of animal breeding in Belgrade, Serbia. | | September 2013<br>October 2013 |
| **Measure 7**<br>**Task 4.** *Membership in national and international scientific communities in the field of reproduction* | Membership of IBIR should be continued in the major European scientific communities in the field of reproduction of humans and animals such as ESDAR, AETE, ESRAD and the financial supports for these activities should be provided. This will give possibilities for our scientists to attend the scientific meetings organized by these organizations at reduced rates of participations fees.<br>ESDAR – not less than 5 researchers;<br>AETE – not less than 5 researchers;<br>ESRADI – not less than 25 researchers.<br>To continue the active membership in the Technological Platform FABRE-TP. | Scientific secretary<br>Chief accountant | Until the middle of each year |
| **Measure 8**<br>**Task 5.** *Continuous monitoring of the interests of the scientific communities and introduction of the research results of IBIR* | Preparation of questionnaires and distribution among the research partners.<br>Organization of Days of Open Doors with the aim to present the research projects and results in IBIR. | Board of Directors<br>Board of Directors | The end of 2014 4<br>November 2014 |

| *Strategic Goal 3:* **Modern research infrastructure** | | | |
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| **Measure 9**<br>**Task 6.** *Enlargement and updating of the technological basis for research of IBIR* | Presentations of representatives of leading firms in the field about new classes and newly developed equipment;<br>Development and participation in projects for updating of the equipment available in IBIR. | Board of Directors | 2014<br>2013 – Operational programme „Competitiveness"<br>2014 – OP „Education and Science" |
| **Measure 9**<br>**Task 7.** *Participation of IBIR in the National Roadmap for scientific infrastructure and guarantee for the access of scientists from IBIR to European Scientific Infrastructure* | To establish connections with representatives of the Ministry of Education, Youth and Science and the leaders of the Bulgarian Consortium „Infrastructure for genomic, proteomic and metabolomics studies and computer simulation and design of drug candidates".<br>Assessment of the options for access to the European high technology scientific infrastructures. | Scientific Secretary<br>Chairperson of the Scientific Council<br>Senior scientists | Until the end of 2013 |
| **Measure 9**<br>**Task 8.** *Experimental animal facility* | Registration of an animal house.<br>To get a formal permit to carry out experiments with laboratory animals.<br>Providing suitable condition for daily functioning of the animal house.<br>Permanent contacts with BAH and the Ethical Commission with the view to update the documents. | Person in charge of the animal house<br>Board of Directors | Until the end of 2013<br>During the whole period |

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| **Measure 11**<br>**Task 9.** *Digital library facilities* | To preserve and enlarge the access to online resources such as SCOPUS, SCIENCE DIRECT, SPRINGER LINK, SWET WISE, THOMSON REUTERS WEB OF KNOWLEDGE, ESSENTIAL SCIENCE INDICATORS, HIGH WIRE PRESS, DOAJ – DIRECTORY OF OPEN ACCESS JOURNALS, RESEARCH GATE, SCIENTIFIC JOURNALS INTERNATIONAL, INCITES®<br>To start the digitalization of the scientific production of IBIR and to provide access to it via the institute network | Librarian | During 2013-2014 |
| *Priority 2:* **Education and training in the area of biology and immunology of reproduction employing the life-long learning approach** | | | |
| *Strategic Goal 1:* **Education and training to support the career development of highly qualified researchers focus on MSc students and PhD fellows** | | | |
| **Measure 13**<br>**Task 10.** *Interdisciplinary and international PhD programs* | Development of interdisciplinary PhD programs for the following disciplines:<br>– Immunology;<br>– Physiology of animals and humans;<br>– Biology and biotechnology of reproduction in farm animals.<br>Announcement of positions in the PhD programs.<br>Organization of continuous training of the PhD students to use the equipment available in IBIR. | Scientific Secretary<br>Scientific guardians of PhD students | Until the end of 2013<br>The end of 2013 for school year 2014–5 positions<br>Until the end of 2014 for school year 2015–?<br>During the whole period |

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| | Multidisciplinary seminars for PhD students (theoretical and methodological).<br>Application for participation in European and international PhD programs and this will suggest education of Bulgaria students in laboratories abroad and acceptance of foreign PhD students in M Currie program.<br>Introduction of the principles for „Innovative doctoral training". | PhD students, Scientific guardians of PhD students | Once in 3 months<br>After the announcement of the position<br>2014 |
| **Measure 13**<br>**Task 11.** *Interdisciplinary and international MSc programs in collaboration with universities* | Recruitment of MSc students for biological, veterinary and medical faculties in Bulgaria and from abroad by dissemination of information on the activities in IBIR, by organising meetings and by dissemination of information by the web page of IBIR.<br>Organization of specialized courses, seminars – Erasmus for all. | Heads of departments Senior Scientists PhD students | 3 positions for 2013–2014<br>October 2013<br>Regularly 2013–2014 |
| *Strategic Goal 2:* **Enhancing the research potential of the scientists of IBIR – BAS on an ongoing basis** | | | |
| **Measure 17**<br>**Task 12.** *Exchange of researchers using European and international programs (COST, Erasmus, M Currie etc)* | Preparation of projects and applications for mobility programs.<br>Participation in international seminars, schools, summer schools. | Scientific Secretary<br>Scientists from IBIR | 2 projects for 2013–2014<br>When such events are organized during international scientific meetings |

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| **Measure 19**<br>**Task 13.** *Recruitment of highly qualified scientists* | Advertising the conditions for research in IBIR by the mass media, scientific contacts and internet information.<br>Providing suitable working conditions for research.<br>Preparation of a project ERA chair pilot project for FP7. | Director of IBIR | 2 positions for 2013–2014<br>Until May 30th 2014<br>Until May 30th 2014 |
| **Measure 20**<br>**Task 14.** *Introduction of new methods for research* | Organization of methodological courses (including commercial firms) for training and introduction of new methods in the research activities. | Board of Directors | Once in a year |
| **Measure 21**<br>**Task 15.** *Organisation and participation of regular seminars to report personal results, lectures from leading scientists (from IBIR or invited lecturers)* | Organization of scientific seminars in the departments.<br>Organization of scientific seminars for the institute for presentation of current personal results.<br>Invitations of lecturers from the country and from abroad. | Heads of departments<br>Scientific secretary<br>Board of Directors | Every two weeks<br>Monthly events<br>2 times per year |
| *Strategic Goal 3:* **Capacity building on research and innovation management** | | | |
| **Measure 22**<br>**Task 16.** *Training in scientific management* | Organization of education for development, implementation and reports of projects by invited specialists.<br>Education about existing scientific programs for financing at national, regional and European | Board of Directors<br>Heads of Departments | Once a year<br>Actual scientific |

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| | level: COST and Horizon 2020 projects, The national Programme for the Development of the Rural Areas, The EU-level structural programme HEALTH, South-East Europe Programme, Interred IV C Programme.<br>– Assignment of persons responsible for collecting current information about the call fo different programs – 3 persons (with good knowledge of English and computer skills);<br>– Presentation of the information collected to the staff of the institute;<br>– Participation in organized information days by different institutions in the country. | | programs to be discussed once in a year<br>Until the end of 2013<br>monthly<br>according to the schedule of the announced days |
| **Measure 25**<br>**Task 17.** *Training in patenting, IPR, transfer of technologies* | Organization of lectures devoted to protection of the intellectual property.<br>Implementation of practice oriented exercises on cases of successful transfer of scientific results in practice.<br>Intensive contacts with JTI-BAS. | Board of Directors<br>Heads of departments | Once in a year<br>3 times per year<br>During the whole period |
| *Priority 3.* **Technology transfer** | | | |
| *Strategic Goal 1:* **Strengthening the cooperation with the businesses** | | | |
| **Measure 26** | Organizing periodical meetings with business representatives, working in the field of reproduction. | Board of Directors | Once in a year |

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| **Task 18.** *Continuous monitoring of the needs of the business and dissemination of the research projects and results of IBIR* | Periodical questionnaire-based surveys of business needs for research collaboration and scientific advice.<br>Participation in other events with the business. | Scientific Council | Once in 2 years<br><br>Ongoing |
| **Measure 27**<br>**Task 19.** *Informing the businesses in Bulgaria about the research results of IBIR with potential for practical applications* | Invitations of the representatives of the business to meetings, expositions, open doors days, round table discussions with the aim to present the research projects and results of IBIR. | Board of Directors<br>Scientific Council | According to schedule of the events but not less than 2 times per year |
| **Measure 29**<br>**Task 20.** *To organize nomination and co-nomination procedures for the selection of the members of the First Advisory Board. To work out the mandate of the Advisory Board* | To set up as Advisory Board consisting of representative of governmental and international experts for annual consultations about the research achievement and annual planning of research and other activities. To develop a detailed description of the mandates of the board, and the length of work of each board. | Board of Directors<br>Scientific Council | The first semester of 2014 |
| **Measure 30**<br>**Task 21.** *To expand the membership of the Scientific Council with representatives from the national business community* | To include representatives of the business in the Scientific Council of IBIR – one person for each direction (reproduction in animals and in humans). | Board of Directors<br>Scientific Council | Until the end of 2013 |
| *Strategic Goal 2:* **IPR protection** | | | |
| **Measure 31**<br>**Task 22.** *Compilation of an inventory of* | IBIR will set up a team for the implementation of this task. The task itself will be composed of two sub-tasks: the first one will be the compilation of | Board of Directors | On an ongoing basis during the whole period |

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| *the research achievements of IBIR and assessment of their potential for practical application* | an inventory of all research achievements of the institute in the last 5 full calendar years, namely since January 2008. The second sub-task will have to involve external to IBIR experts so that the potential for practical applications of these results can be evaluated. Business representatives will be engaged in assessing the applicability potential of the research achievements. | Authors of the new products<br>Authors of the research and invited experts from the Center of Technology Transfer, BAS | |
| *Strategic goal 3:* **IBIR – BAS to become a center with certification functions for export and import of genetic material (semen, oocytes and embryos) in Bulgaria** | | | |
| **Measure 33**<br>**Task 23.** *Feasibility study (evaluation and analysis of the potential) on the acreditation of laboratory for analysis of the quality of spermatozoa, oocytes and embryos* | To start the organization of a certified laboratory for analysis of the quality of spermatozoa, oocytes and embryos (discussions with the Ministry of Agriculture and food, Executive agency for selection and reproduction in farm breeding and the rest institutions licensed for such activities. | Board of Directors | 2013–2014 |
| *Priority 4.* **Enhancing the research and innovation cooperation and networking in the country and abroad** | | | |
| *Strategic Goal 1:* **Expanding the partnership network in Bulgaria and strengthening the social-oriented research** | | | |
| **Measure 36**<br>**Task 24.** *Identifying new national research partners* | Expanding the collaboration with partners in the country. | Board of Directors<br>Heads of departments | On an ongoing basis during the whole period |
| **Measure 36** | Extension of the scientific collaboration with institutions working in the field of reproduction | Board of Directors | On an ongoing basis during the whole |

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| **Task 25.** *Identifying new research topics of common interest* | of humans and animals | Heads of departments | period |
| **Measure 37**<br>**Task 26.** *Development of collaborative redearch plan* | Organizing working meetings for developing or updating the research plans. This action will be focused on strengthening the research collaboration with the current research partners, for the current action plan. | Board of Directors<br>Heads of departments | Once per annum. For the current action plan such meetings will be organised in the second semester of 2014 |
| *Strategic Goal 2:* **Expanding the partnership network in EU** | | | |
| **Measure 38**<br>**Task 27.** *Expanding collaboration with partners from the EU* | Expanding the collaboration with partner institutions in the European Union. | Board of Directors<br>Scientific Council<br>Members of the Executive Committee of the Action | During the whole period<br>COST Action FA1201 2013–2016/<br>Until the end of 2013 in COST Action FA1205 to be included<br>After announcement of calls |
| **Measure 39**<br>**Task 28.** *Developing bilateral agreements* | Strengthening the bilateral collaboration between IBIR and institute of the Czech Academy of Sciences. | Board of Directors<br>Scientific Council<br>Principal investi-gators of projects | During the whole period<br>2 projects for the ЕБР 2013-2014 |
| **Measure 41**<br>**Task 29.** *Development of research projects focused on assessment of the effects of food quality on the* | European Association for safety of food / EFSA – Research projects to be developed. | Principal investigators of projects | One Until the end of 2013<br>One project in 2014 |

| *Strategic Goal 3:* **Building a network of international organizations** | | | |
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| *reproductive health*<br>**Measure 42**<br>**Task 30.** *Mapping of relevant research organisations and establishing contacts in China, Egypt, Russia, Korea and Japan* | Reestablishing the scientific collaboration with China, Russia, Korea, and Japan through submission of joint projects. | Scientific secretary<br>Principal investigator of the project | After announcement of calls for collaboration |
| *Strategic Goal 4:* **Visibility of IBIR – BAS through promotion and advertising** | | | |
| **Measure 43**<br>**Task 33.** *Maintenance of the web-site* | Reconstruction, re-design and ongoing maintenance of the web-site of IBIR in Bulgarian and in English. | Librarian | Ongoing during the whole period |
| **Measure 44**<br>**Task 34.** *Profile of IBIR in the social media* | Visibility of IBIR in social media: FaceBook, Twitter, LinkedIn. | Scientific secretary | Ongoing during the whole period |
| **Measure 45**<br>**Task 35.** *Annual promotional plan* | Annual promotional plan as an integral part of the Action Plan for the implementation of the RTDI strategy. | Board of Directors<br>Scientific Council | At the end of each calendar year |

**REPUBLIC OF BULGARIA**

Ministry of Education and Science

**TO:**

**THE INSTITUTE OF BIOLOGY AND IMMUNOLOGY OF REPRODUCTION**

**BULGARIAN ACADEMY OF SCIENCES**

**73 TZARIGRADSKO SHOSE**

**1113 SOFIA**

**BULGARIA**

**Letter support for RTDI strategy of IBIR-BAS**

The Bulgarian Ministry of Education and Science welcomes and furthermore supports the Research and Innovation strategy of the Institute of Biology and Immunology of Reproduction (IBIR), developed in the framework of implementation of an FP7 Research Potential project, **ReProForce**, with the additional expertise of three European experts. The Strategy develops a clear and ambitious action plan for IBIR 2014-2020 to achieve the main mission of the Institute, which is performing the fundamental and applied scientific investigations in the biology and immunology of animal and human reproduction dedicated at resolving of social problems like reproductive health, sustainable usage and restoration of natural resources and integrate fully its vision to become a reliable research partner within the European Research Area.

The Ministry acknowledges that, considering the societal impact of science conducted at IBIR in both human and veterinary medicine, the transfer of knowledge and science into the practice will be a key priority for IBIR in the coming years. New technologies and methods developed in partnership with business and research partners will be crucial for IBIR since they will bring not only additional expertise to the Institute but increase its visibility among business and society at the large, as well as the trust to IBIR's research outputs by its end-users.

Indeed, MES strongly support the new strategy of IBIR, which it hopes will sustain the establishment of IBIR as an important research center in its unique field of human and animal reproduction.

Regards,

**LORA PAVLOVA**

*Director of the Science Directorate*

## THE INSTITUTE BIOLOGY AND IMMUNOLOGY OF REPRODUCTION „ACAD. K. BRATANOV"

BULGARIAN ACADEMY OF SCIENCES

The Institute of Biology and Immunology of Reproduction „Acad. K.Bratanov" (IBIR) is the successor of the Institute for Artificial Insemination and Breeding Diseases which was founded in 1938. Since 1943 the research activities of the Institute were closely associated with the name of Professor Kiril Bratanov, a full member of the Bulgarian Academy of Sciences, who had been the Director of the Institute until his death in 1986. He is the author of the paper „On the production of sperm antibodies in the organisms of farm animals" (1949) recognised as the fundamental paper of the **new scientific field – Reproductive Immunology.** Thanks to his work Bulgaria is recognised as the motherland of the new biomedical field in the global science and clinical parctice – Immunology of Reproduction. Under the patronage of Acad. K. Bratanov the **International Coordination Committee of Immunology of Reproduction (ICCIR) was** registered in Paris and Sofia, with its residence at the IBIR (1967) and International **Society of Immunology of Reproduction (ISIR, 1975) was** founded. The scientific Symposia of this Society are regular and organized by IBIR in Varna each three years.

Under guidance of prof. Bratanov for the first time in our country the transfer of both fresh and/or frozen-thawed embryos in farm animals was implemented and lead to the birth of healthy progeny. For the first time in Europe

and second in the world a team of IBIR successfully transferred embryo in buffalos to obtain buffalo-calves.

Since the 1990s the institute started conducting research on stem cells, which also was a pioneering activity in the country.

Since the 1990s the institute started conducting research on stem cells, which was a pioneering activity in the country. The following innovative products have been developed:

- Protocols for the isolation, characterisation and differentiation of mesenchyme stem cells from different tissues and organs of adult organisms.
- Protocols for the obtaining and characterization of iPSC.
- Methods for obtaining and cryoconservation of hemopoetic stem cells from umbilical cord.

Since the beginning of this century the staff started research on autoimmune mechanisms in diseases of reproductive system like endometriosis; investigations on tumour specific antigens and neo-angiogenesis in prostate cancer and mammalian gland cancer. On the basis of these research activities the clinical application of panel from 9 immunohistochemical markers was developed for prostate carcinoma as well as the new target molecules for diagnosis and therapy on the base of micro RNA.

Nowadays the focus of scientific research of IBIR-BAS is on the biological, immunological, endocrinological, cryobiological and biotechnological aspects of the process of reproduction in all its stages: gametogenesis, fertilisation, implantation, pregnancy and ontogenesis. The research work thus encompasses investigations on cellular and molecular mechanisms of biological recognition in reproduction; factors and mechanisms that participate in the gametogenesis, fertilisation, implantation and pregnancy; elucidation of processes of auto-reactivity and autoimmune response in reproduction; revealing the role of bio-molecules and metabolic processes for cryopreservation and storage of reproductive tissues and cells; development of biotechnology approaches for artificial fertilisation, micromanipulation and embryo-transfer in farm animals. The research activities have resulted in the development of diversified approaches for reproduction regulation and infertility prevention. Altogether, these issues are closely linked to the public welfare, namely environmental resources development, reproductive health and quality of live.