APPROVED BY
Order No.
of the Minister of Education and Science
and the Minister of Economy of the
Republic of Lithuania
of 2014

ACTION PLAN OF THE PRIORITY "ADVANCED MEDICINAL ENGINEERING FOR EARLY DIAGNOSTICS AND TREATMENT" OF THE PRIORITY AREA OF RESEARCH AND EXPERIMENTAL (SOCIO-CULTURAL) DEVELOPMENT AND INNOVATION (SMART SPECIALIZATION) "HEALTH TECHNOLOGIES AND BIOTECHNOLOGIES"

CHAPTER I
GENERAL PROVISIONS

1. The action plan of the priority "Advanced Medicinal Engineering for Early Diagnostics and Treatment" of the priority area of research and experimental (socio-cultural) development and innovation (smart specialization) (hereinafter - the Priority RDI Area) "Health Technologies and Biotechnologies" (hereinafter - the Action Plan) was drawn up in the implementation of the Implementation Programme of Priority Areas of Research and Experimental (Socio-cultural) Development and Innovation (Smart Specialization) and their Priorities approved by Order No. 411 of the Government of the Republic of Lithuania of 30 April 2014 On the Approval of the Programme for the Implementation of Priority Areas of Research and Experimental (Socio-Cultural) Development and Innovation (Smart Specialization) and Their Priorities (hereinafter - the Programme).

2. The Action Plan was drawn up for establishing the provisions of the implementation of the Priority "Advanced Medicinal Engineering for Early Diagnostics and Treatment" (hereinafter - the Priority) of the Priority RDI Area "Health Technologies and Biotechnologies".

3. The Action Plan shall be implemented in 2015–2020.

4. Concepts used in the Action Plan include:

4.1. **Additive technologies** shall mean technologies for creating biomaterials (including compositional) and products with functional features set, based on smart 3D printing.

4.2. **Biomedicinal engineering** shall mean the implementation of engineering principles and methods solving medicinal and biological problems.

4.3. **Clinical decision support** shall mean the delivery of clinical recommendations and advices to a physician using the information stored in large databases and inventing the algorithms of its retraction.

4.4. **Mechatronics** shall mean an interdisciplinary area that joins mechanics, electronics, control and computer technologies.

4.5. **Medicinal materials or biomaterials** shall mean all materials, surfaces, or structures in contact with tissues or biological systems.

4.6. **Nanomedicine** shall mean the application of nanotechnologies for medicinal diagnostics and therapy.

5. Other concepts used in the Action Plan shall correspond to concepts used in the Programme.

CHAPTER II
DESCRIPTION OF THE CURRENT SITUATION

6. Lithuania has got a field of unique synergy opportunities for innovations. High power high speed laser technologies, widely developed in both, private production and public research sectors, are widely contemporary used in molecular, cellular and tissue imaging areas and applied in various diagnostic and therapeutic procedures.

7. Currently, the implementation of the Priority is relevant to 14 production companies operating in the country. As of the year 2012, five companies with the added value of EUR 159 million in production of various medicinal equipment, prosthesis, reagent and so on operated in the sector of manufacturing radiation, electromedicinal, and electrotherapy equipment.

8. According to the data of the Department of Statistics, corporate investments in research and experimental (social, cultural) development (hereinafter - R&D) made about EUR 7.4 million in 2007–2013.

9. In 2012, the export of electromedicinal equipment made about EUR 157 million. In the same year, the export of mechanotherapeutic equipment made about EUR 17 million.

10. Increasing export opportunities are conditioned by rapidly developing market for medicinal devices. It is forecasted that the market for wireless medicinal technologies will grow more than 37 percent annually and reach EUR 25 million by 2019; the market for orthopaedic and rehabilitation equipment will grow by 7 percent and exceed EUR 9 million by 2019.

11. Research and education institutions of Lithuania maintain close relationship with businesses participating in activities of Laser and Engineering Technology Cluster, Advanced Orthopaedics and Rehabilitation Means Cluster, and Odontology Innovations Cluster. Cooperation and synergy between scientific and education institution, developing medicinal technologies and natural sciences, is possible.

12. The potential of Lithuanian science and education institutions in the area of medicinal engineering is relatively high. Such institutions perform fundamental and contractual research, and, in cooperation with Lithuanian and foreign companies and science institutions, prepare highly qualified specialists. The volume of specialists prepared in this area increases every year.

Challenges and problems addressed by the implementation of the Priority had been relevant for a long time. Significant progress was reached supporting the research from the EU structural funds in 2007-2013. The progress was at a large extend influenced by National Research Programme “Chronic Non-infectious Diseases”, financed from the state budged of the Republic of Lithuania from 2010; the objective of the programme was to increase the scientific knowledge necessary to reduce the morbidity, mortality and disability from such diseases, to work out strategic principles of their prevention and develop improved their prevention and diagnostic methods. In formulating a combination of measures necessary for the implementation of the Priority, the progress achieved in the area of research of fundamental medicinal engineering was taken into account.

Such important to the well-being of the state and the society area as medicinal engineering is not planned to be abandoned in the future. From 2015, the implementation of new National Research Programme “Healthy ageing”, financed from the state budged of the Republic of Lithuania is planned. The programme will be aimed at the complex analysis of biomedicinal and socio-medicinal issues and problems of healthy ageing in Lithuania, deliver solutions based on research and technological development and the results of fundamental and applied research. It is likely that the programme implementation results will be useful for the implementation of the Priority.

In the implementation of the development programmes of Integrated Centres for Science, Studies and Business (Valleys), research centres containing R&D infrastructure used in activities relevant for the implementation of the Priority are created. The centres for science mentioned involve the Joint Innovative Medicine Centre developed by the State Research Institute on the infrastructure of the Centre for Innovative Medicine, Multifunctional Laser Facility “NAGLIS” that started its activities in Vilnius University Laser Research Centre in 2014, and other laser research facilities. Facilities significant for the implementation of the Priority currently are being developed in the Joint Life Sciences Centre, which will bring together the potential of biotechnological and biochemical sciences of Vilnius University, and the New Pharmaceutical and Health Technology Centre, which started it activities in Lithuanian University of Health Sciences in Kaunas in 2014.

The new EU Framework Programme for Research and Innovation Horizon 2020 provides for several public area tasks, in the solution whereof active involvement of Lithuanian researchers and other specialists is expected in the areas of health, demographic changes, and welfare. In addition, active participation in the implementation of the task in the area of Advanced Science (future and

developing technologies) and the task in the area of Industrial Leadership (leadership in the developing of high impact and industrial technologies) is planned.

13. Aiming to implement the Priority, it is worth while to sustain and concentrate R&D resources in such R&D subject areas as medicine and its branches (especially neurosciences, cardiology, oncology, gastroenterology, etc.), biophysics, technologies of lasers, sensors, ultrasound, medicinal information, electronics, bioinformation, knowledge engineering, imaging, and signalling. Aiming to improve skills of human resources in such areas, high quality specialists must be prepared in the scientific areas mentioned above, especially noting multidisciplinary, multi-directional, doctoral studies and post-doctoral practice. Also for Lithuania that aims to stimulate economic restructuring and competitiveness by its own resources, it is worth while to promote intensive cooperation of science and education institutions with the organisations and centres, performing experimental and clinical medicine research, and businesses, developing knowledge-intensive products; and strengthen business capacity to contribute to the development and implementation of technologies developed in such economic sectors as biomedicinal engineering, electronics and informatics, lasers, ultrasonic diagnostics, biomaterial engineering, textile, medicinal equipment, computerised monitoring, and health promotion.

14. Having high level scientific potential in such areas as biotechnologies and laser industry, Lithuania could obtain solid competitive advantage developing laser technologies and stimulating the invasion of this industry into medicinal applications. Synergies, that are worth while to use, exist at the juncture of clinical medicine, having long-term traditions, medicinal electronics, and biomedicinal engineering, where relevant medicinal issues are solved using innovative methods and devices of early diagnostics related to smart sensors, wireless non-invasive health monitoring systems, customised prediction, prevention, and artificial intelligence. Thus, small and medium businesses can solve the most of relevant health care issues and occupy new market niches, employing the outcome of electronics and biomedicinal engineering.

Technologies successfully developed and implemented while implementing the Action Plan would allow for the use of the broad spectrum of medicinal competencies and the information accumulated (from genetics to the monitoring of physiological processes) for holistic modelling of diseases (especially overlapping), search for new markers, improvement of reliability of diagnostic and therapeutic decisions, taking niches in the market of diagnostic and therapeutic means, products (smart wired and wireless sensors with embedded systems, new integrated diagnostic and therapeutic systems, etc.) and services, use of new technologies, hardware and software tool from such areas as photonics, photosensibilisation, ultrasonic characterisation of tissues, non-invasive and low-invasive technologies, and development of their application.

CHAPTER III
ALIGNMENT OF THE ACTION PLAN TO THE PROGRAMME AND OTHER STRATEGIC DOCUMENTS

15. The Action Plan contributes to the implementation of the strategic goal and goals provided for in subparagraphs 19.1 and 19.2 of the Programme as well as of the task established in subparagraph 20.2 – to promote R&D and innovation activities, which would allow for the reduction of expenses for the health care and acquisition of medicines, treatment, and nursing in elderly patients, occurring due to the increasing lifetime of humans; increase healthy lifetime; reduction of the pandemic risk and the geographical dispersion of infections; seeking for the reduction of systemic toxic pollution of the environment; growing influence of high quality medicinal specialists due to the globalisation and growing competition.

16. Actions of the Action Plan:

16.1. Create and introduce to the market new technologies, products, processes and methods.

16.2. Encourage the creation of knowledge-intensive business and development of companies having large potential.

16.3. Encourage clusterization, integration into international value creation networks and investments into RDI.

16.4. Promote science and business cooperation, transfer of knowledge and technologies in order to commercialize RDI results.

16.5. Enhance the potential of science and education institutions and their abilities to create and commercialize knowledge and to prepare science and innovation management specialists.

17. In the implementation of the Action Plan the intention is to contribute to changes, which are expected in the implementation of the National Progress Strategy Lithuania 2030 approved by Resolution No. XI-2015 of the Seimas of the Republic of Lithuania On the Approval of the National Progress Strategy Lithuania 2030 of 15 May 2012. Results achieved during the implementation of the Priority will form an integral part of good public health situation ensuring active participation in public life, thus the Priority will mostly contribute to the implementation of the vision of the creation of smart and healthy society.

CHAPTER IV
PRIORITY IMPLEMENTATION STAGES

18. Measures used for the implementation of the Priority have been selected in accordance with the Innovation Development Programme of Lithuania approved by Resolution No. 1281 of the Government of the Republic of Lithuania of 18 December 2013, the National Programme for the Development of Studies, Research and Experimental (Socio-Cultural) Development for 2013–2020 approved by Resolution No. 1494 of the Government of the Republic of Lithuania of 5 December 2012 and its implementing legislation.

19. A set of education and RDI policy measures necessary for the implementation of the Priority has been determined in light of the report presented by international working group of independent experts of 21 February 2014 Priority Implementation Signposts. Pursuant to this report, the following Priority implementation stages can be distinguished:

19.1. The stage of generation of scientific potential critical mass includes activities related to the creation of appropriate environment for the search for new ideas and solutions, development of technologies and prototypes and the readiness to carry out these activities.

19.2. The search for new ideas and solutions include fundamental scientific research of general and targeted nature necessary for the implementation of the Priority.

19.3. The stage of the creation of technologies and their prototypes includes industrial scientific research and experimental development activities necessary for the implementation of the Priority

19.4. The stage of introduction into the market includes activities related to introducing new products in the market.

19.5. The stage of generating critical mass of business potential includes activities related to the transmission and dissemination of knowledge and innovation, and the use thereof at large.

20. Actions established in subparagraphs 16.1-16.5 are implemented by executing the measures set forth in Annex 1 to the Action Plan.

21. Annex 2 to the Action Plan provides for a set of education and RDI policy measures relevant in each Priority implementation stage.

22. Annex 1 to the Action Plan establishes actions and measures implemented given the set of education and RDI policy measures presented in Annex 2.

CHAPTER V
THEMATIC SPECIFICS OF THE PRIORITY

23. The implementation of the action plan is aimed at consolidation of medicinal, natural science, and technological competencies and relevant resources for the development of new holistic diagnostic and therapeutic methods and their implementation in a form of health care products and services:

23.1. Develop technologies for disease modelling, medicinal informatics, and knowledge engineering.

23.2. Develop methods, technologies, and software tools for the processing of medicinal images and signals registered (secondary processing), i.e. counting of quantitative parameters of images and signals related to the structure and functions of tissues and organs, and identifying early pathological changes.

23.3. Examine and develop knowledge engineering technologies for identifying the information, knowledge, internal patterns and obtaining diagnostic markers out of large general databases, cloud computing technologies.

23.4. Develop software for modelling and forecasting diseases, supporting clinical decisions (recommendation on diagnostics and therapy), computerised navigation methods and means for minimally invasive surgery.

23.5. Examine and develop biomedicinal engineering, electronic, mechatronic, and biochemical technologies.

23.6. Search for new technological solutions in regards to the early stages of diseases that require especially sensitive diagnostic principles and methods; look for the methods of the interaction between the radiation with non-linear effect and biological environment, ultrasound sonography markers for the identification of neurodegenerative alterations, new complex mechanisms with therapeutic effect on cells and tissues; examine optoacoustic non-linear synergistic mechanisms.

23.7. Search for and examine innovative solutions for non-stationary monitoring complexively using multi-modal signal flows.

23.8. Examine sensor controlled data interfaces and fusion, intra and inter personal physiological multi-modal signal interfaces and directional synchronisations; look for new diagnostic and monitoring solutions using the principles of complex dynamic system analysis.

23.9. Examine and develop laser and ultrasound diagnostic and therapeutic technologies.

23.10. Examine and develop methods and devises for early non-invasive diagnostics for such areas as neurology, oncology, differential diagnostics of tissues.

23.11. Develop therapeutic equipment: means for sonoporation, photosensibilisation, targeted and controlled administration of medicines and tissue engineering, nanomedicine and biooptics, infusion equipment, non-invasive and minimally invasive therapeutic instruments.

23.12. Examine and develop new technologies of ultrasonic transcranial non-innasive sonoghraphy and monitoring for early diagnostics of neurodegenerative diseases, evaluation of intracranial pressure; search for the engineering solutions and develop software for the increased prescription of sonography, 3D segmentation and imaging, methodologies of laser applications in diagnostics and therapy, gene and tissue engineering; develop devices that will register new diagnostic markers based on optoelectric, laser, and ultrasonic methods.

23.13. Examine and develop medicinal materials (biomaterials), rehabilitation, and nanomedicinal technologies.

23.14. Examine and develop customised biomaterials and orthopaedic products based on 3D imaging and produced in a way of 3D printing, biocompatible and nanomaterial- based covers, prototypes of smart functional and antimicrobial textile materials, prothesys, biomechatronic means for disabled people; implement new additive production technologies (protocols) prepared, aimed at manufacturing of such products.

23.15. Manufacture pilot batches of new generation rehabilitation and compensation equipment distinguishing by adaptivity, human and computer interface, and mechatronic technologies.

23.16. Examine and develop biocompatible materials, formed on basis of additive production technologies, bioceramics, polymer composites that replace metals in production of medicinal implants, functional materials used for the implants, endo and exo prosthesis, smart textile, nanomaterials, orthopaedic, smart rehabilitation, compensation biomechatronic means for disabled people.

24. Successful implementation of activities mentioned in subparagraphs 23.1-23.16 of the Action Plan is inseparable from R&D activities carried out by public and private institutions.

25. Important role in the implementation of the Priority is played by Joint initiatives for educational, research and experimental (socio-cultural) development and innovation initiatives (hereinafter - joint initiatives), on the basis whereof problems relevant to sectors of economy are planned to be solved conducting R&D activities on topics relevant to the sectors of economy and hoping for the inclusion of private sector entities in the realization of R&D activity results. While implementing Joint initiatives, activities, mentioned in subparagraphs 23.1-23.16, should allow:

25.1. Introduce to the market and provide health care institutions with new biocompatible biomaterials and smart functional materials, technologies, compensation and rehabilitation equipment.

25.2. Introduce to the market and provide health care institutions with new specific diagnostic and therapeutic equipment.

25.3. Introduce to the market and provide health care institutions with new customised health promotion and physiological monitoring equipment.

25.4. Introduce to the market and provide health care institutions with software and knowledge engineering equipment to physicians.

26. Subparagraphs 23.1-23.16 of the Action Plan may be amended by excluding or including activities as suggested by Research and experimental (socio-cultural) development and innovation priority implementation coordination group formed by the Order of the Minister of Economy and the Minister of Education and Science No. V-576/4-409 of June 20, 2014 (hereinafter - Coordination group), taking into account data collected during the monitoring and evaluation of the implementation of the Programme and the Action Plan and other substantiate data and suggestions.

CHAPTER VI
IMPLEMENTATION OF THE ACTION PLAN

27. Possible sources of the implementation of the Action Plan:

27.1. state budget funds of the Republic of Lithuania:

27.1.1. Funds for measures of the 1st priority “Promoting Research, Experimental Development and Innovation” of the European Union structural fund action programme 2014-2020 (hereinafter - the Action Programme), 3rd priority of the Action Programme “Promoting Competitiveness of Small and Medium Enterprises” and 9th priority of the Action Programme “Public Education and Increase of Human Resource Potential”.

27.1.2. Lithuanian state budget funds (excluding the European Union structural funds);

27.2. Funds of scientific and education institutions.

27.3. Funds of private legal persons.

27.4. Funds of the European Union Research and Innovation Programme Horizon 2020 and other international programmes.

28. A part of funds for measures of priority 1 and priority 9 of the Action Programme are intended for direct support of activities necessary for the implementation of the Priority, thus table presented in Annex 1 provides for preliminary amount, which is planned to be used for the implementation of the Priority depending on need.

29. A part of funds for measures of priority 1 of the Action Programme unattributed to any specific priorities of priority areas of research and experimental (socio-cultural) development and innovation (smart specialization) (hereinafter - RDI priorities), the results of the implementation thereof can contribute to the implementation of all or the majority of RDI priorities. These measures are marked in the table presented in Annex 1 to the Action Plan with an asterisk.

30. A part of priority 9 measures implemented using the Lithuanian state budget funds are relevant to the entire education and RDI system, and are not attributed to any specific RDI priorities, however, their implementation results will also may contribute to the implementation of the Priority. These measures are marked in the table presented in Annex 1 to the Action Plan with two asterisks.

31. The measures under Priority 3 of the Operational Programme, although relevant to the entire business climate improvement and business support system, will contribute indirectly to the

implementation of the Action Plan, mainly by facilitating the market uptake of new products from the private sector entities and by generating the critical mass of business potential.

In the course of implementing the measures under priority 3, the activities, which are relevant to the Priority implementation, like product and/or product design development, the deployment of key enabling technologies in traditional industries, the production presentation in international exhibitions and fairs, the certification of products and services, which are planned to be exported, new production and service capacity building, the development of infrastructure of business incubators, membership in international networks (platforms), awareness raising with regard to new products and services and consultations for business start-ups, are planned to be supported.'

32. The plan is to have funds of science and education institutions attracted by supporting activities related to the creation and renewal of education and RDI infrastructure necessary for the implementation of the Priority (by implementing infrastructure projects, co-funding of science and education institutions is expected). These funds are included in the graph "State budget funds and other funds" in the table presented in Annex 1 to the Action Plan.

33. The plan is to have funds of private legal entities attracted by implementing measures, projects executed on the basis whereof are planned to be co-funded by the state - business companies will have to cover a part of the project value using their own funds. These funds are included in the graph "Private sector funds" in the table presented in Annex 1 to the Action Plan.

34. The Priority may be partially implemented by participating in the European Union Research and Innovation Programme Horizon 2020 and other international programmes. Funds attracted participating in international programmes are not indicated in the table presented in Annex 1 to the Action Plan.

35. The implementation of the Action Plan seeks for quantitative and qualitative results in line with the evaluation criteria set in Annex 1.

36. Deadlines for publishing calls for applications for measures implementing the actions of the Action Plan or for concluding project lists will be planned for in accordance with the plans for publishing calls for applications and concluding project lists prepared by ministries, as provided for in administration rules of 2014-2020 EU fund investment action programmes approved by Resolution No. 1090 of the Government of the Republic of Lithuania of 3 October 2014 On the Approval of Administration Rules of 2014-2020 EU Fund Investment Action Programmes.

37. Development of the priority areas of research and experimental (socio-cultural) development and innovation (smart specialization) and the implementation of priorities thereof are coordinated by the Coordination group.

38. The Programme and the Action Plans of the RDI Priorities are implemented to promote and support interaction and cooperation between business entities and science and education institutions. The promotion of cooperation between business entities and science and education institutions, in accordance with the procedure established by the Ministry of Education and Science and the Ministry of Economy, is implemented by the Agency for Science, Innovation and Technology. The implementation process of the Programme is continuously monitored by analysing and assessing the implementation of the Action Plans of RDI Priorities. Monitoring and assessment of the Programme implementation, in accordance with the procedure established by the Ministry of Education and Science and the Ministry of Economy, is carried out by the Science and Studies Monitoring and Analysis Center (MOSTA).

39. Implementation of the Action Plan is coordinated, facilitated, and analysed as well as evaluated, according to evaluation criteria set in Annex 1 and other aspects on ongoing basis, pursuant to the mechanism of the facilitation, ongoing analysis and evaluation of the implementation of priority areas of research and experimental (socio-cultural) development and innovation (smart specialization) as well as their priorities, approved by the Ministry of Education and Science and the Ministry of Economy.

40. Infrastructure created and equipment purchased during projects planned to be funded from EU funds or other sources and executed on the basis of education and RDI policy measures set in Annex 1 of the Action Plan shall not duplicate equipment currently possessed by science and

education institutions or other public sector entities, except for cases when the capacity of the existing equipment is not enough for ensuring the implementation of the Priority.

41. A list of measures presented in Annex 1 to the Action Plan may be amended in light of the results of the planned interim evaluation of the Priority implementation in 2018, also having assessed the needs of potential executors of the measures.

Annex No 1
to the Action Plan of the Priority
“Advanced Medicinal Engineering for Early Diagnostics and Treatment”
of the priority area of research and experimental (socio-cultural) development
“Health Technologies and Biotechnologies”

Actions, measures, preliminary need for funds for the implementation thereof and evaluation criteria

Actions and measures	Preliminary funds, thousand EUR			Institution in charge	Evaluation criteria of actions and measures	Criteria values	
	European Union structural funds	State budget and other funds	Private sector funds			2018	2023
Action 1. Create and introduce to the market new technologies, products, processes and methods.					**Created prototypes (concepts) of products, services or processes within 3 years after the implementation of the project (pcs.)**	**6**	**14**
Measure 1.1. Joint science and business projects contributing to the implementation of smart specialization	1 620	-	-	Ministry of Education and Science	Number of projects performed jointly by business and education institutions (pcs.)	2	4
	506	-	458	Ministry of Economy	Number of certified products (pcs.)	0	1
Measure 1.2. Support for the creation or development of the company’s RDI infrastructure and implementation of RDI activities (“Intelektas”)	3 639	-	3 316				
Measure 1.3. Support for company RDI providing innovation vouchers (“Inovaciniai čekiai”)							
Measure 1.4. Support for patenting inventions and design (“InoPatent LT”)							
Measure 1.5. Support for precertification of new products and technologies and for conducting tests in laboratories under actual conditions (“Inosertifikavimas”)							
Action 2. Encourage the creation of knowledge-intensive business and development of companies having large potential.	1 303	-	145		**New companies having received investments within 3 years after the implementation of the project (pcs.)**	**1**	**2**
Measure 2.1. Support for the provision of innovation consulting services (“Inogeb LT”)					Number of companies receiving financial support in some other form than a subsidy (pcs.)	1	3
Measure 2.2. Support to companies engaged in RDI by financial tools (“Technostartas LT”, “Koinvest LT”)							

Action 3. Encourage clusterization, integration into international value creation networks and investments into RDI.					**Attracted foreign investments into RDI area according to the areas of smart specialization within 3 years after the implementation of the project (thousand EUR)**	**42 353***	**95 295***
Measure 3.1. Support for cluster operation ("InoKlaster LT")	3 716		370		Number of legally binding agreements with international partners (pcs.)	4	10
Measure 3.2. Support for participating in international RDI initiatives ("InoConect LT")							
Measure 3.3. Support for cluster operation ("InoKlaster LT+")							
Measure 3.4. Support to the R&D infrastructure of common use ("Infrastructure of technological centres")							
Measure 3.5. Support for the investment in industrial territory (SmartPark LT)							
Measure 3.6. Support for raising the direct foreign investments in RDI area ("SmartInvest LT")	5 792*	-	-				
Measure 3.7. Support for direct foreign investments in RDI area ("SmartInvest LT+")	28 962*	-	32 011*				
Action 4. Promote science and business cooperation, transfer of knowledge and technologies in order to commercialize R&D results.				Ministry of Education and Science	**Business R&D orders executed by science and education institutions (thousand EUR)**	**62**	**80.8**
					Revenues of science and education institutions from intellectual activity results (thousand EUR)	**4.6**	**6**
Measure 4.1. Creation of the material base intended for the implementation of joint science and business projects and the development thereof in science and education institutions (creation and development of infrastructure of centres of excellence)	8 690*	-	-		Patent applications (pcs.) Doctoral studies conducted together with business entities (number of doctoral students)	2 1	5 2
Measure 4.2. Support for the implementation of RDI activities executed by centres of excellence	11 580*	-	-				
Measure 4.3. Implementation of market-oriented science and business projects through cross-border network	268	-	-				
Measure 4.4. Encouragement of commercialization of R&D activity results in science and education institutions	41	504**	-				
Action 5. Enhance the potential of science and education institutions and their abilities to create and commercialize knowledge and to prepare specialists.					**External users from foreign science and education institutions, Lithuanian and foreign business companies having used the renewed open access research infrastructure (funds received from these users (thousand EUR)**	**14.4**	**18.7**

					Number of publications in frequently cited periodicals (pcs.)	**14**	**19**
Measure 5.1. Renewal of RDI and education infrastructure in the areas of smart specialization	52 132*	-	-		Number of researchers working in improved research infrastructure base (full-time equivalents)	28	37
Measure 5.2. Creation and development of European research infrastructures as well as integration of Lithuania into the European research infrastructures pursuant to the Lithuanian research infrastructure signpost and ESFRI**	26 066*	1008**	-		Number of spin-offs created in science and education institutions (units)	0	1
Measure 5.3. Renewal of equipment used in open-access centres by areas of smart specialization	1 332	-	-				
Measure 5.4. R&D activities conducted by Lithuanian science and education institutions	990	-	-				
Measure 5.5. Subscription of databases necessary for RDI activities	28 960*	-	-				
Measure 5.6. Creation of infrastructure of centres of excellence and parallel laboratories	26 645*	504**					
Measure 5.7. Development of information infrastructure for science and education (LITNET)	4 340*	-	-				
Measure 5.8. Support to activities of parallel laboratories	1 448*	-	-				
Measure 5.9. Attraction of foreign scientists and R&D activities	14 481*	-	-				
Measure 5.10. Promoting activities of innovation and technology transmission centres of science and education institutions	14 480*	-	-				
Measure 5.11. Ensurance of the doctoral study process; doctoral studies, trips, scholarship, R&D, transfer, funds for visits (including foreign doctoral students)	1 287	62 154**	-				
Measure 5.12. Employment of scientists and other researchers in knowledge-intensive enterprises	2 896*	-	-				
Measure 5.13. Attracting and reintegrating scholars	5 792*	-	-				
Measure 5.14. Student R&D activities	2 317*	-	-				
Measure 5.15. Promotion of internships after doctoral studies	7 240*	-	-				
Measure 5.16. Preparation of specialists in smart specialization priority-related study programmes	93	-	-				
Measure 5.17. Development of science popularization system	12 000**						
Measure 5.18. Funding of undergraduate, graduate, integrated and non-degree studies	-	220 032**	-				
Measure 5.19. Support for mobility of Lithuanian and foreign students and teachers	-	3 438**	-				

Measure 5.20. Practical trainings for scientists and other researchers, participation of scientists and other researchers in targeted events of international programmes, participation of Lithuanian researchers in targeted meetings for the preparation of project applications, participation of representatives from Lithuania in the European Union and other international working groups, committees, commissions, related to research and experimental (socio-cultural) development. / Encouragement of participation in H2020	4 503**	258**	-				
Measure 5.21. Ensure funding for R&D activities relevant for the solution of top-level problems strategically important to the public and the state as well as economic development	-	94 314**	-				
Measure 5.22. Support cross-sectoral cooperation in R&D area	-	2 364**	-				
Measure 5.23. Allow researchers to use digital scientific data resources	-	450**	-				

* Funds unattributed to specific priority area of research and experimental (socio-cultural) development and innovation (smart specialization), their implementation results can contribute to the implementation of all or the majority of RDI priorities.

** Funds for measures relevant to the entire RDI system and are unattributed to specific RDI priorities, their implementation results will also contribute to the implementation of the Priority.

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Annex No. 2
to the Action Plan of the Priority
"Advanced Medicinal Engineering for Early Diagnostics and Treatment"
of the priority area of research and experimental (socio-cultural) development
"Health Technologies and Biotechnologies"

SET OF EDUCATION AND RDI POLICY MEASURES

<table>
<tr><th>Generation of science potential critical mass</th><th>Search for new ideas and their solutions</th><th>Creation of technologies and their prototypes</th><th>Introduction into the market</th><th>Generation of business potential critical mass</th></tr>
<tr><td>Measure 5.1. Renewal of RDI and education infrastructure in the areas of smart specialization</td><td colspan="3">Measure 1.1. Joint science and business projects contributing to the implementation of smart specialization</td><td>Measure 3.1. Support for cluster operation ("InoKlaster LT")</td></tr>
<tr><td>Measure 5.2. Creation and development of the European research infrastructures and Lithuania's integration into the European research infrastructures pursuant to Lithuanian research infrastructure signpost and ESFRI</td><td colspan="2">Measure 1.2. Support for the creation or development of the company's RDI infrastructure and implementation of RDI activities ("Intellect LT")</td><td></td><td>Measure 3.2. Support for participating in international RDI initiatives ("InoConnect LT")</td></tr>
<tr><td>Measure 5.3. Renewal of equipment used in open-access centres by areas of smart specialization</td><td>Measure 5.4. R&D activities conducted by Lithuanian science and education institutions</td><td colspan="2">1.5. Support for precertification of new products and technologies and for conducting tests in laboratories under actual conditions ("Inocertification")</td><td>Measure 5.12. Employment of scientists and other researchers in knowledge-intensive enterprises</td></tr>
<tr><td>Measure 5.5. Subscription of databases necessary for RDI activities</td><td colspan="4">Measure 2.1. Support for the provision of innovation consulting services ("Inogeb LT")</td></tr>
<tr><td>Measure 5.6. Creation of infrastructure of centres of excellence and parallel laboratories</td><td colspan="4">Measure 2.2. Support to companies engaged in RDI by financial tools ("Technostart LT", "CoInvest LT")</td></tr>
<tr><td>Measure 5.7. Development of information infrastructure for science and education (LITNET)</td><td colspan="4">Measure 3.3. Support for raising the direct foreign investments in RDI area ("Smartinvest LT")</td></tr>
<tr><td>Measure 5.8. Support to activities of parallel laboratories</td><td colspan="4">Measure 3.4. Support for direct foreign investments in RDI area ("SmartInvest LT+")</td></tr>
<tr><td>Measure 5.10. Promoting activities of innovation and technology transmission centres of science and education institutions</td><td colspan="4">Measure 4.4. Encouragement of commercialization of R&D activity results in science and education institutions</td></tr>
<tr><td>Measure 5.11. Ensurance of the doctoral study process; doctoral studies, trips, scholarship, R&D,</td><td>Measure 5.21. To ensure funding for R&D activities relevant for</td><td>Measure 1.3. Support for company RDI providing</td><td>-</td><td>-</td></tr>
</table>

transfer, funds for visits (including foreign doctoral students)	the solution of top-level problems strategically important to the public and the state as well as economic development	innovation vouchers (“Innovation Vouchers”), cross-boarder network		
Measure 5.13. Attracting and reintegrating scholars	Measure 3.2. Support for participating in international RDI initiatives (“InoConnect LT”)			
Measure 5.15. Promotion of internships after doctoral studies	Measure 5.14. Student R&D activities			
Measure 5.9. Attraction of foreign scientists and R&D activities		Measure 1.4. Support for patenting inventions and design (“InoPatent LT”)		
Measure 5.16. Preparation of specialists in smart specialization priority-related study programmes	-	Measure 4.3. Implementation of market-oriented science and business projects through cross-border network		
Measure 5.17. Development of science popularization system		-		
Measure 5.18. Funding of undergraduate, graduate, integrated and non-degree studies				
Measure 5.19. Support for mobility of Lithuanian and foreign students and teachers				
Measure 5.20. Practical trainings for scientists and other researchers, participation of scientists and other researchers in targeted events of international programmes, participation of Lithuanian researchers in targeted meetings for the preparation of project applications, participation of representatives from Lithuania in the European Union and other international working groups, committees, commissions, related to research and experimental (socio-cultural) development. / Encouragement of participation in H2020				
Measure 5.22. Support cross-sectoral cooperation in R&D area				
Measure 5.23. Allow researchers to use digital scientific data resources				
Measure 4.1. Creation of the material base intended for the implementation of joint science and business projects and the development thereof in science and education institutions (creation and development of infrastructure of centres of excellence)				
Measure 4.2. Support for the implementation of RDI activities executed by centres of excellence				