

Report of the JRC-EC - CEI – ICGEB European Workshop “Smart Specializations Strategy in the Field of Biotechnologies in Europe: A Challenge for CEE Countries”

Introduction

JRC-EC – CEI – ICGEB European Workshop: “**Smart Specializations Strategy in the Field of Biotechnologies in Europe: A Challenge for CEE Countries**” (held in Hotel Tatra, Bratislava, from September 4th to September 6th 2017) was organized by Faculty of Natural Sciences of University of SS. Cyril and Methodius in Trnava in cooperation with Slovak Academy of Sciences and ICARST, Bratislava and under auspices of Ministry of Education, Science, Research and Sport of the Slovak Republic and Ministry of Foreign and European Affairs of the Slovak Republic with the financial and expertise support from the Joint Research Centre of European Commission (JRC-EC), the Central European Initiative (CEI) and the International Centre for Genetic Engineering and Biotechnology (ICGEB).

International advisory board included Prof. M. Giacca, (ICGEB, Trieste, Italy), Dr. G. Van Den Eede (JRC-EC, Petten, Netherlands), Dr. P. Canciani (CEI, Trieste, Italy), Prof. M. Kaltschmitt (Hamburg University of Technology, Germany), Prof. R. Boča (University of Ss. Cyril and Methodius in Trnava, Slovakia), Prof. G. Fassina (Xeptagen, Italy), Prof. J. Šajbidor (Slovak Technology University, Bratislava, Slovakia), Prof. M. Novák (Slovak Academy of Sciences, Bratislava, Slovakia), Prof. K. M. A. Gartland (Caledonian University of Glasgow, UK).

JRC-EC – CEI – ICGEB European Workshop was opened to researchers, technologists, industrial representatives and entrepreneurs, experts, and representatives from international organizations and NGO, governmental officers, involved in the field of Biotechnology from whole Europe. The Workshop was co-sponsored by JRC-EC, CEI and ICGEB. Key speakers and limited number of invited participants from CEE countries were supported covering their costs associated with travel, meals and accommodation.

Objectives

The Workshop was focused on the survey and evaluation of current state and prospects of development of R&I areas included within RIS3 strategy in many European countries with

particular focus on Biotechnology and on regional cooperation of CEE countries. The overall objective of the Workshop was to further promote Research and Innovation with the focus on CEE countries in the field of Biotechnology ranging from industrial biotechnology, biobased industries and bioeconomy, through environmental, agro-food biotechnology up to medicinal and pharma biotechnologies. The Workshop aimed at providing a forum for discussion between multi-sectorial stakeholders to share knowledge and experience and to formulate recommendations on national and regional level towards increasing smart specialization, competitiveness and impact on related biotech industries, strengthening the regional cooperation within European research programs and cooperation with international organizations such as JRC-EC, ICGEB, CEI.

Participants

At the JRC-EC – CEI – ICGEB European Workshop “Smart Specialization Strategy in the Field of Biotechnologies in Europe: A Challenge for CEE Countries”, more than 100 experts from 22 European countries participated (the list of participants is in Annex 1).

Workshop Program

The Workshop program began on September 4th 2017 at 9.00. During opening session, all participants were welcomed by Prof. S. Miertuš as the Workshop Chairman (University of SS. Cyril and Methodius in Trnava, Trnava and ICARST, Bratislava, Slovak Republic), prof. J. Lehotay, vice-rector (University of SS. Cyril and Methodius in Trnava, Trnava, Slovak Republic), Dr. G. Van Den Eede head of the Unit (Joint Research Centre, European Commission, Petten, Netherlands), Dr. P. Canciani, Project Coordinator (Central European Initiative, Trieste, Italy), Prof. M. Giacca, Director General (International Centre for Genetic Engineering and Biotechnology, Trieste, Italy), Prof. P. Samuely, vice-President (Slovak Academy of Sciences, Bratislava, Slovakia), Prof. J. Pastorek, vice-Chairman (Board of Government of Slovak Republic for Research and Innovation, Bratislava, Slovakia) and Dr. Z. Chudá, Director of the Department for International Economic Affairs (Ministry of Foreign and European Affairs of the Slovak Republic).

The scientific lectures followed on key topics of the workshop were presented. There were organized in the following sections: Introduction to smart specialization strategy, Key lectures

on Biotechnology progress and prospects, Biorefinery concepts and perspectives, Novel breeding technologies and Future medicinal biotechnologies.

This was continued by presentations of International programs to support biotechnologies and biobased industries development relevant to RIS3 (EC Horizon 2020, ICGEB, JRC-EC, CEI, EBTNA).

Next sections were dedicated to Industrial and environmental biotechnologies, "Green" agro-food biotechnologies, Medicinal and pharma biotechnologies including Pharmacology, Gene therapy, diagnostics and Stem cells, tissue engineering, bioadditive manufacturing and regenerative medicine. These were followed by Development of national and regional cooperation in biotechnologies - role of biotechnology centers and clusters, Bioeconomy. Third day of the Workshop was focused on following sections: From research to innovation and to industry in biotechnology, public-private partnership, future biobased high tech industries, Country reports and regional cooperation (IBT, biobased industry, medicinal biotechnologies high tech industries - RIS3 - selected CEE countries), Regional cooperation in biotechnologies - potential role of international programs. The final part of the Workshop was dedicated to the discussion on possible follow-up actions and recommendations.

Detail workshop program is in Annex 2.

Results and Outputs

Key lectures provided mostly the overview of current state and progress in individual fields of biotechnology, having in mind that biotechnology plays a central role for several key sectors of Smart Specialization Strategy (see figures in Annex 3 and 4). Therefore, RIS specialization strategy in various countries in Europe including CEE countries could be developed within key sectors which could slightly vary from one country to another, however, the essential contribution of Biotechnology fields is always present.

Altogether 45 lectures were delivered and 19 posters were presented. All presented lectures are available on the Workshop web site (<http://www.ris3-eu-biotech-workshop-2017.eu/presentations/>). The abstracts of all contributions are also accessible in the form of Book of abstracts (distributed among participants as a hard copy) and also on the web-site of workshop (<http://www.ris3-eu-biotech-workshop-2017.eu/book-of-abstracts/>). Selected lectures will be further elaborated and published in the form full papers in the Special Issue of International Scientific journal (the journal is under negotiation).

Discussion after every session and final part of the Workshop dedicated to the discussion on possible follow-up actions lead to the series of proposals and recommendations which are summarized below.

Visibility and dissemination of results:

The Workshop has been announced, widely publicized and reported after the completion of the event on the following media:

- Official web site of the Workshop (<http://www.ris3-eu-biotech-workshop-2017.eu>),
- Official communication/media tools of FNS of the UCM – web (<http://fpv.ucm.sk>) and Facebook,
- Official communication/media tools of ICGEB – web (<http://www.icgeb.org>), Facebook, Instagram,
- Official web site of the CEI (<http://www.cei.int>),
- Official web site of the ICARST (<http://www.icarst.org>),
- Press release sent to TASR (The News Agency of the Slovak Republic)
- The survey of the current situation and prospects in Biotechnology in Central and Eastern European countries (which came out from the Workshop) will be also submitted for publishing to the international scientific journal (Current Opinion in Biotechnology).

Photodocumentation related to the Workshop can be also found at the official web site of the Workshop (<http://www.ris3-eu-biotech-workshop-2017.eu>).

Assessment of the WSP

The assessment of quality of organization of the Workshop has been performed using two questionnaires – one from ICGEB and second from CEI. Statistical evaluation of assessment is given in the Annex 5.

Concluding remarks and recommendations

Participant's contributions evaluated current trends in research, innovations and cooperation in the field of Biotechnologies as well as concept of Bioeconomy. Presented contributions and discussion referred to various problems in Biotechnology research, innovation, relevant

industrial development as well as various forms of regional and international cooperation, need of modern approaches in education (PhD programs, Masters, etc.).

It was underlined that there is still insufficient integration of research and innovation, especially in Central and Eastern European countries. Another problem is the weak interest and lack of mechanism for the entry of potential investors into biotechnology capital-intensive areas.

Therefore, it has been stressed necessity of setting up of national and regional sectorial networks including various stakeholders (academia, applied research institutions, SMEs and high-tech industries, governmental institutions, international organizations, etc.)

A) Regarding part of industrial biotechnology and biomass utilization it was underlined that:

- Biomass is a limited resource used within the food market, the markets for raw materials as well as the energy markets. To supply all these markets based on relative smaller amounts of fertile land **political measures need to be urgently implemented to use biomass more efficiently. The biorefinery approach is a very promising option in this respect.**
- Biomass is a priori a decentralized source. **Thus innovative biorefinery approaches have to take care of this and should to be also technologically possible on the farm level.**
- Biogas plants can act as a sink for basically any kind of organic waste material (exception: wood). Thus **biogas plants can act as a core component of such innovative biorefinery approaches realized on the small scale.**
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B) It was also stated and underlined also by JRC-EC experts that:

- Biotechnology is a central part of the Bioeconomy and Biomedicine and smart specialization strategies should take account of its innovation potential in relation to the relatively high importance of primary production in the CEE region, as well as the development of a low-carbon, prosperous (regional) economy able to compensate the structural changes in the primary production sector.
- The workshop showcased the high level of biotechnology research in the region but also **the synergistic potential that would lie in interregional cooperation in this**

field. However, the view of local business and hence the discussion of how to convert the scientific excellence in the region into marketable products should be strengthened in follow-up actions.

- **The smart specialization process is there to support this and the JRC-EC (together with other international organizations) is available to support follow-up events to this workshop widening the range of participating stakeholders.**
- A relatively large part of the workshop was devoted to red biotechnology (note: it was also due to the focus of cooperating institutions, such as ICGEB). Obviously, white and also green Biotechnologies, probably in combination with ICT and new business models might create interesting opportunities in rural areas that are hit the hardest by the structural changes the agricultural sector is currently undergoing and therefore should be equally taken into consideration. To which extent the Smart Specialization Strategies of the region take these views into consideration should be further analyzed and evaluated.
- As individual regions might not have the critical mass for a given priority development, like biotech based bio-refineries, or clinical testing of new bio-medical products, **setting- up of collaborative inter-regional networks is encouraged. The S3-platforms can provide support in this context and help to link-up with other national and international partners.**

Several follow-up actions and initiatives have been recommended by participating institutions and experts to be taken in due consideration, namely:

- **It is recommended to the organizers in cooperation with selected expert representatives to prepare and publish a Survey of the situation in Biotechnology in CEE countries** and relevance to RIS3 strategy in recognized international Journal
- **Representative of Ministry of Foreign Affairs of SR** encouraged the organizers (UCM, ICARST, SAS) to continue in the tradition to organize every two years European Workshop on Biotechnology (including also Bioeconomy, Biomedicine and related topics) focusing on the increase of regional cooperation in CEE countries within the framework of EU countries, and to progress in implementation of RIS3 action plan. Such regular Workshops should be also platform for joint preparation cooperative projects including next EC Framework

Program 9 for the period 2021 – 2027 and setting-up of regional network for Biotechnology.

- **The JRC-EC**

- Expressed the availability to support follow-up events to this workshop widening the range of participating stakeholders. Biotechnology as part of the smart specialization process is there to support the key programs in the region.
- Setting- up of collaborative inter-regional networks is also encouraged by JRC-EC. The S3-platforms can provide support in this context and help to link-up with other national and international partners as well as multisectorial stakeholders

- **ICGEB** representatives recommended to take into due consideration the following:

- Continue and expand workshop program - **ICGEB is keen to continue support such kind of workshops, based on high level lectures, right formula** (bringing together a mix from the European and local scientific community) and in conjunction with other international organizations (JRC-EC and CEI in particular)
- Finance people development, not only infrastructure - ICGEB wishes to stress the relevance of building human resources for research and technology transfer. The ICGEB believes that in the countries of reference to this meeting there are many opportunities for growth in terms of infrastructure and instrumentation, however less opportunities for growth of young scientists and tech transfer professionals. Thus **the development of mobility fellowships, short-term PhD programs and joint research grant programs with the ICGEB labs would ensure increased impact of research carried out and suitability for industrial development and is highly recommended**
- Establish an ICGEB regional research centre in the CEE region - the ICGEB is involved in the establishment of Regional Research Centers in other areas of the world. A similar initiative is recommended in one of the CEE Countries which would permit establishment of research programs of regional interest in the field of Biotechnology.
- Expand cooperation with JRC and EC - the ICGEB wishes to extend its cooperation with JRC-EC involving its Member States, especially in CEE

countries, in order to acquire more competence in implementing projects and cooperation agreements with the EC

- Use digital learning for education - human capital development can be essentially contributed using digital learning platforms: such as the ICGEB podcast program, which already hosts over 480 events that can be downloaded or watched on line, and can represent a hub for the collection of educational material specific to a program to be carried out and further developed in the CEE countries.

- **EBTNA** representatives expressed the interest to cooperate and recommended to take into consideration the following:

- Cooperate in organization of Courses and Workshops in CEE region in collaboration with other national and international institutions participating in present Workshop, possibly also as joint (satellite) meetings with European Biotechnology Congress series
- Promote joint Eurobiotech Schools in Master Degree or related forms within EC framework programs in cooperation with also with CEE countries
- Open distance learning platform could be further promoted and used effectively together with other learning programs (e.g. ICGEB)
- The Eurobiotech Journal (edited by EBTNA) is ready to cooperate at the publication of follow-up papers coming from the present Workshop

- **CEI** representatives expressed the following:

- Appreciation to local organizers of the present Workshop, as well as the encouragement to organize a follow-up Workshop for CEE countries
- Support of knowledge transfer in biotechnology focusing on Biofuels, Biobased products, industrial and green biotechnology and especially Bioeconomy)
- Support of regional cooperative programs (Danube Initiative, Interreg, bilateral programs in CEE countries)
- Support of the projects focused on innovative start-ups and SMEs – transfer of know-how in CEE region.

- **Working group of pre-accession countries (SRB, BiH, MNE, ALB, UKR, MLD)**
underlined the following:

- appreciated the focus of the Workshop and particularly involvement of these countries helping to facilitate knowledge building and regional cooperation
- proposed to build up joint teams for better links in research and education between pre-accession countries and EU in biotechnology and bioeconomy and for preparation of concerted proposals in Mobility of students and researchers: Erasmus+, KA1 and KA2, CEEPUS, Bilateral programmes of cooperation, COST, H2020 MSC , etc. as well as in Research programmes e.g. H2020, Berlin process – Foundation for WBs, COST, Bilateral projects (Moldavia/Ukraine/Romania, soft, hard projects), EUSDR instruments, Interreg, Trieste system, etc.
- supported the development of the scheme for cooperative use of research infrastructure especially ESFRI/ERIC (CERIC ERIC), to expand the open access to already established ones
- suggested to create joint teams of the pre-accession countries for Cooperation at the preparation of RIS3 action plan and its implementation (Serbia, Moldova, Ukraine, Montenegro, etc.)

- **In the final plenary session of the Workshop it was recommended:**

- **That CEE countries should focus on improvement of regional cooperation under umbrella “Biotechnology and Bioeconomy” which will** support the transition process: „Traditional agriculture to life sciences“ and it should cover a comprehensive value added chains (primary production, conversion (biotechnology, bioengineering), market (consumer), etc. Bioeconomy should facilitate the involvement of different levels and stakeholders (politicians, economy, companies, scientific institutions, society,
- **To set-up regional network on** biotechnology integrating the educational process (MSc., PhD,) together with innovation, technology transfer, entrepreneurship and market in existing EC educational and research programmes
- To set-up of teams for the preparation of joint proposals related to the field of Biotechnology, Bioeconomy and Biomedicine for European funding

organizations including Horizon 2020, Interreg, Danube Initiative, and joint preparation of cooperation project proposals for funding period 2021 - 2027.

- To foster regional research structures utilizing concerted approach
- **To create regional permanent platform** from the large companies in the Biotech space with the individuals which are or would become entrepreneurs. This activity should be driven from outside of academia
- **To set-up cluster organization for smart specialization areas (such as Biotechnology)** on regional or even pan-regional level, which will interconnect universities & industries and will create a critical mass for projects & infrastructure investment bringing together scientists, industrial partners and consumers on specific areas of biotechnology (long term Public-Private-Partnership)
- To organize in 2019 (or 2020) the **Follow-up Workshop (in cooperation with JRC-EC, ICGEB, CEI, EBTNA) on Challenges in Biotechnologies under RIS3 Strategy in EU with the focus on CEE countries.** Workshop should be organized in Slovakia (or other CEE country) and will evaluate progress in implementation of above recommendations, as well as will serve as a discussion platform to design concerted actions for the next period.

It was concluded at the end that the implementation of above mentioned proposals and recommendations will be monitored by the panel consisting of selected organizing committee members and invited experts/representatives who participated in the Workshop. The implementation of proposed follow-up actions will be taken in due consideration at the preparation of the next European Workshop.

Annex 1: List of participants.

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Annex 2: Workshop program.

3rd September 2017 (Sunday)	
18:00-21:00	Early registration of participants at the Registration Desk
19:00-21:00	Dinner
20:00-21:00	Walk in the Historical City Centre of Bratislava – optional
4th September 2017 (Monday)	
8:00-8:45	Registration of participants at the Registration Desk
9:00-9:20	Opening session: welcome and greetings Prof. S. Miertuš (University of SS. Cyril and Methodius in Trnava & ICARST) Prof. J. Lehotay, vice-rector of UCM JRC-EC (Dr. G. Van Den Eede), CEI (Dr. P. Canciani), ICGEB (Prof. M. Giacca) Slovak Academy of Sciences (Prof. P. Samuely, vice-president SAS) Ministry of Education, Science and Sport of the Slovak Republic (representative of minister) Ministry of Foreign and European Affairs (Dr. Z. Chudá, MFEA, Slovakia) Board of Government of Slovak Republic for Research and Innovation (Prof. J. Pastorek, vice-Chairman)
Introduction to smart specialization strategy (Chair: Prof. S. Miertuš)	
9:20	Smart specialization strategy in Europe, JRC-EC current programs and prospects (Dr. J. Gómez Prieto, JRC-EC, Spain)
9:50	RIS3 strategy in Slovakia - current state and relevance to Biotechnology (Prof. J. Pastorek, vice-Chairman of the Board of Government of Slovak Republic for Research and Innovation)
10:10-10:30	Coffee break
Key lectures (Chairs: Dr. P. Canciani and Prof. B. Kamm)	
10:30	Opportunities in Biotechnology (Prof. K. Gartland, Glasgow Caledonian University, UK)
11:00	Biogas plants – A core component for small scale biorefinery concepts (Prof. M. Kaltschmitt, Hamburg University of Technology, Germany)
11:30	Novel breeding technologies (Dr. G. Van Den Eede, JRC-EC, Belgium)
12:00	Future medicinal biotechnologies (Prof. M. Giacca, ICGEB, Italy)
12:30	Discussion
13:00-14:00	Lunch
International programs to support biotechnologies and biobased industries development relevant to RIS3 (EC Horizon 2020, ICGEB, JRC-EC, CEI)	
14:00	The smart specialization thematic platforms, promoting interregional cooperation towards joint businesses (Dr. J. Gómez Prieto, JRC-EC, Spain)
14:30	Biotechnology programme at ICGEB (Prof. M. Giacca, ICGEB, Italy)
15:00	CEI regional programs on bioeconomy, advanced biofuels and biotechnology (Dr. P. Canciani, CEI, Italy)
Industrial and environmental biotechnologies: R&D and biobased industries (Chairs: Prof. M. Kaltschmitt and Prof. K. Gartland)	
15:20	Biomass value chain (availability, logistic, transformation technologies, applications) (P. von Bothmer, FNR, Germany)
15:40	Biocatalysis: an efficient tool of industrial biotechnology (Prof. R. Kourist, TU Graz, Austria)
16:10-16:30	Coffee break
16:30	Producing biobased chemicals using industrial biotechnology (Prof. B. Kamm, Wood-Kplus, Austria)
17:00	Case studies for biotechnological polyhydroxyalkanoate (PHA) biopolyester production from (agro) industrial surplus materials (Dr. M. Koller, University of Graz, Austria)
17:30	Case study of algae production integration to waste water treatment: introduction of the Climate-KIC MAB2.0 project (Dr. M. Gyalai-Korpos, PANNON Pro Innovations Ltd., Hungary)
17:50	Remediation and environmental biotechnologies (Dr. P. Kaszycki, University of Agriculture in Krakow, Poland)
18:10-19:00	Discussion
19:00	Dinner - Welcome party accompanied by folklore music and dancing
5th September 2017 (Tuesday)	
"Green" agro-food biotechnologies (Chairs: Dr. G. Van Den Eede and Prof. P. Kaszycki)	
8:30	The plant microbiome and next generation agriculture (Prof. V. Venturi, ICGEB, Italy)
9:00	Food biotechnology and biotechnological foods (Prof. A. Slavica, University of Zagreb, Croatia)
9:30	The role of biotechnology in Slovak animal production (Prof. J. Rafay, UCM, Slovakia)
Medicinal and pharma biotechnologies	
Pharmacology, gene therapy, diagnostics (Chairs: Prof. E. Sykova and Dr. I. Lacík)	
9:50	Proprotein convertase 1/3 inhibited macrophages: A novel therapeutic based on Drone macrophages (Prof. F. Rodet, University of Lille, France)

- 10:10 Gene therapy for heart diseases (Dr. S. Zacchigna, ICGEB, Italy)
- 10:30-10:50 Coffee break
- 10:50 Biomarkers development for early detection of cancer: reducing the burden of cancer in the ageing society (Prof. G. Fassina, Xeptagen, Italy)
- 11:20 Diagnostic potential of biosensors in medicinal biotechnology and biomedicine (Dr. J. Tkáč, SAS, Slovakia)
- 11:40 Health aspects and molecular mechanisms of action of Vitamin D (Prof. A. Moulas, Technological Education Institute, Greece)
- 12:00 **Discussion**
- 13:00-14:00 Lunch
- Stem cells, tissue engineering, bioadditive manufacturing and regenerative medicine** (Chairs: Prof. Venturi and Prof. S. Pastoreková)
- 14:00 Stem cells and biomaterials for treatment of neurodegenerative diseases (Prof. E. Sykova, The Institute of Experimental Medicine, Czech Republic)
- 14:30 Biotechnologically reconstructed human tissue models in toxicity testing of chemicals, pharmaceuticals and cosmetics (Dr. H. Kandarova, MatTek Corp., Slovakia)
- 14:50 Multi-scale polymeric constructs scaffolds for tissue engineering (Prof. F. Chiellini, University of Pisa, Italy)
- 15:20 Additive manufacturing in regenerative medicine (Prof. R. Hudák, Technical University of Košice, Slovakia)
- 15:40 Encapsulated pancreatic islets: the next generation diabetes treatment (Dr. I. Lacík, SAS, Slovakia)
- 16:00 Opportunities for biosimilar drugs (Dr. M. Baralle, ICGEB, Italy)
- 16:20-16:40 Coffee break
- Development of national and regional cooperation in biotechnologies - role of biotechnology centers and clusters, bioeconomy** (Chairs: Prof. M. Dündar and Dr. J. Gómez Prieto)
- 16:40 Key programs and international cooperation of Biomedical center of SAS (Prof. S. Pastoreková, SAS, Slovakia)
- 17:00 The Austrian Centre of Industrial Biotechnology – towards regional research networks for the bioeconomy (Prof. R. Kourist, TU Graz, Austria)
- 17:20 BIOEAST: Central and Eastern European Initiative for knowledge-based agriculture, aquaculture and forestry in bioeconomy (Dr. V. Vasary, Research Institute of Agricultural Economics, Hungary)
- 17:40 Bioeconomy: the key issues in Europe (Dr. J. Kreysa, JRC-EC, Belgium)
- 18:10-19:00 **Discussion**
- 19:00 Dinner
- 20:00-22:00 **Poster session - Discussion at posters and Laser show**
- 6th September 2017 (Wednesday)**
- From research to innovation and to industry in biotechnology, public-private partnership, future biobased high tech industries** (Chairs: Prof. G. Fassina and Prof. R. Kourist)
- 8:30 Overcoming barriers to biotechnology SME creation within the CEE region (Dr. M. Dettenhofer, CEITEC, Czech Republic)
- 8:50 A concrete offer by ICGEB for transferring know-how to industry (Dr. N. Skoko, ICGEB, Italy)
- 9:10 Biotechnology: from the lab to the industrial scale and market (B. Vanlerberghe, Bio Based Europe Pilot Plant, Belgium)
- 9:30 From research and innovation to high tech in diagnostics: The experience of MAGI in combating rare genetic diseases (Dr. M. Bertelli, MAGI, Italy)
- Country reports and regional cooperation (IBT, biobased industry, medicinal biotechnologies high tech industries - RIS3 - selected CEE countries)** (Chairs: Prof. V. Nedović, Dr. M. Dettenhofer and Prof. H. Dürrstein)
- 9:50 Biotechnology in Slovakia – current situation (Prof. J. Turňa/Prof. S. Stuchlík, University of Comenius, Slovakia)
- 10:10 Current state of biotechnology and prospects in Serbia (Dr. J. Begovic, Institute of Molecular Genetics and Genetic Engineering, Serbia)
- 10:30-10:50 Coffee break
- 10:50 Current state of biotechnology and prospects in Ukraine in the view of Smart strategy (Prof. Y. Blume, Ukraine)
- 11:10 Knowledge on biodiversity as a platform for competitive biotechnology development in Bosnia and Herzegovina (Prof. L. Pojskic, INGEb, Bosnia and Herzegovina)
- 11:30 Current state of biotechnology and prospects in Croatia (Prof. Z. Kurtanjek, University of Zagreb, Croatia)
- Regional cooperation in biotechnologies - potential role of international programs** (Chairs: Dr. M. Bertelli and Dr. M. Gyalai-Korpos)
- 11:50 Initiatives for promoting bioeconomy– national experiences and recommendations for the Danube Region (Prof. H. Dürrstein, BOKU, Austria)
- 12:05 Applications of biotechnology and EBTNA (Prof. M. Dündar, EBTNA, Turkey)
- 12:20 Central European Initiative – CEI: Towards a Danube Bioeconomy RTI strategy (Dr. P. Canciani, CEI, Italy)
- 12:35 ICGEB activities in Central and Eastern Europe (Prof. V. Venturi, ICGEB, Italy)
- 12:50-13:00 **Discussion**

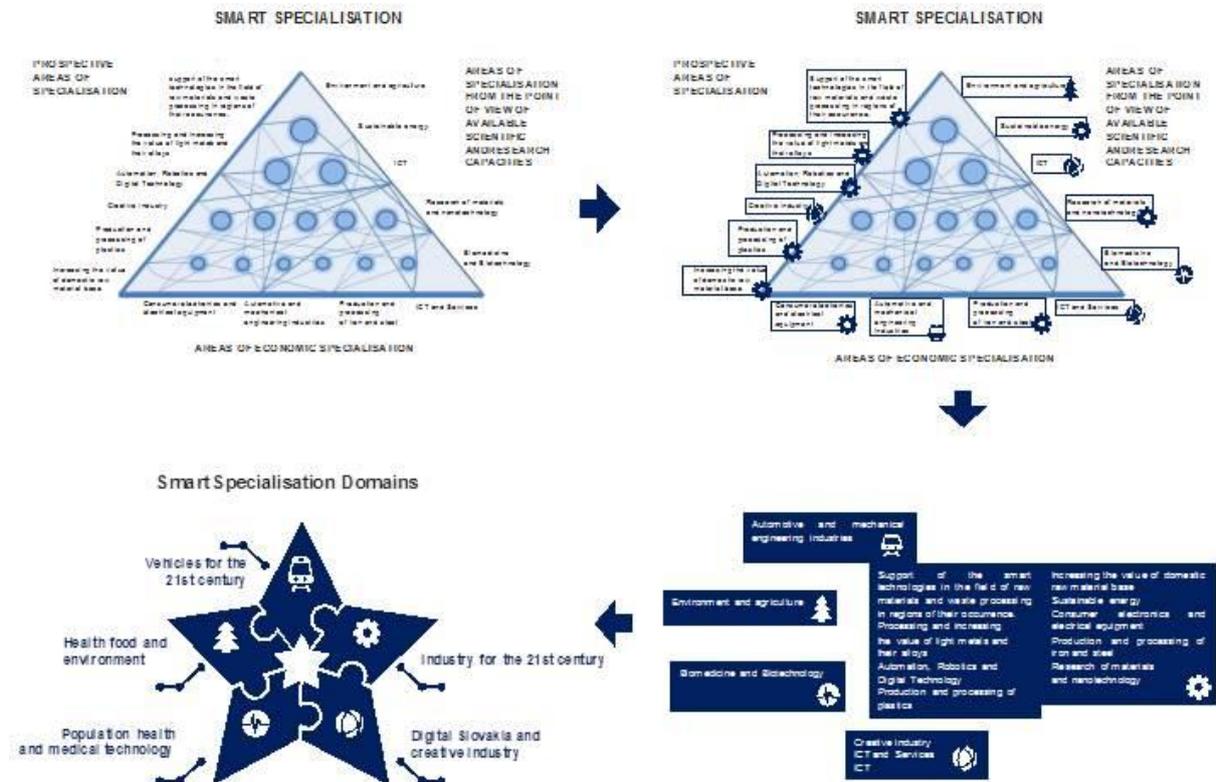
13:00-14:00 Lunch

14:00 **Working groups (WGs) discussion on regional cooperation in biotechnologies focusing on smart specialization**

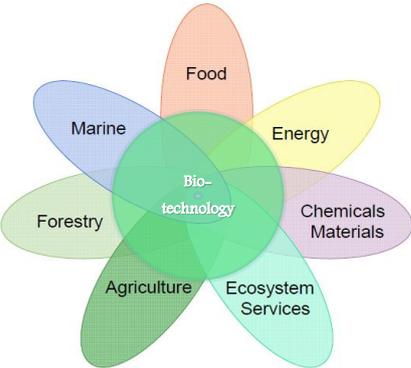
15:00 **Preparation of proposals on regional cooperation by individual WGs under coordination of each WG leader - rapporteur**

15:30-16:00 **Presentation of WG proposals by WG leaders (rapporteurs), plenary panel discussion, recommendation and conclusions**

Annex 3: Smart Specialisation – the concept strategy in Slovakia (figure taken from the presentation of Prof. Pastorek).



Annex 4: Central role of Biotechnology (figure taken from the presentation of Dr. Kreysa).



Annex 5: The statistical evaluation of organization quality assessment of the Workshop according to two questionnaires – one from ICGEB and second from CEI

The CEI questionnaires were submitted by 43 participants. They answered the following questions (questionnaire categories were very good, good, acceptable, insufficient, poor):

How do you evaluate:

- The overall organisation – 40 from 43 participants mark organization of the Workshop as very good and only 3 marks organization as good
- The documentation provided – 34 from 43 participants mark documentation provided as very good, 8 mark as good and one as acceptable
- The participation – 23 from 43 participants mark participation as very good, 19 mark as good and one refrained from answering
- The quality of presentations – 22 from 43 participants mark quality of the presentations as very good, 20 mark as good and only one as acceptable
- The opportunity for networking – 27 from 43 participants mark opportunity for networking as very good, 15 mark good and one refrained from answering
- The planned follow-up – 27 from 43 participants mark planned follow-up as very good, 5 as good, one as insufficient and 5 participants refrained from answering
- The CEI visibility – 31 from 43 participants mark CEI visibility as very good, 9 mark as good, 2 as acceptable and one refrained from answering

The ICGEB questionnaires submitted by 65 participants. They answered the following questions:

How did you learn about this meeting?

- 22 from 65 participants learn about this meeting from friends and colleagues
- 24 from 65 participants learn about this meeting from e-mail communication with main organizer or ICGEB
- 12 from 65 participants learn about this meeting from web-site of main organizer
- 7 from 65 participants learn about this meeting from previous meeting (CEI or ICGEB)

How do you evaluate the individual aspects of the Workshop (ranking from 5 = excellent to 1 = poor/unsatisfactory):

- Overall assessment – average rating 4.82
- Program – 4.75
- Scientific talks – 4.75
- Oral presentation – 4.63
- Poster session – 4.63
- Practical session – 4.55
- Time for discussion – 4.16
- Time for interaction – 4.55

- Venue/location – 4.91
- Accommodation – 4.92
- Scientific – 4.93
- Administrative – 4.98