



# Mapping of EU Member States' / regions' Research and Innovation plans & Strategies for Smart Specialisation (RIS3) on Bioeconomy

## Task 3

### Case Study Report Olomouc region, Czech Republic

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## 1. Short Regional Bioeconomy Profile

<b>Name of the case region/country</b>	Olomoucký kraj (Olomouc Region), NUTS 3
<b>Member State</b>	Czech Republic
<b>GDP – Euro per capita (2014)*</b>	12 200 for NUTS 2 Stredni Morava (Central Moravia)
<b>Total ESIF Research &amp; Innovation per capita per year*</b>	44.74 for NUTS 2 Stredni Morava (Central Moravia)
<b>Total H2020 per capita per year*</b>	1.26 for NUTS 2 Stredni Morava (Central Moravia)
<b>Value Chain Approach to the Bioeconomy**</b>	Biomass processing and conversion – foods and beverages, crop-based primary production; Bio-based products – bio-based chemicals, cosmetics and health; Bioeconomy R+I and Tech Support – biologically active materials and drugs, crop and cattle production support;
<b>Thematic Focus of the Bioeconomy Approach**</b>	Agro-Food – crop production, food processing Other bio-based Industries – biopharmaceuticals, biochemical products
<b>Research and Innovation Fields highlighted for the Bioeconomy**</b>	Biology, biotechnology, chemistry, life sciences, nano technologies, new materials Primary production with quality – agronomy and crop sciences, oenology, etc.,
<b>Bioeconomy Activity Level**</b>	Moderate innovator
<b>CASE STUDY SUMMARY</b>	
<b>Bioeconomy Approach</b>	Two major bioeconomy fields – first linked to crop and cattle production with R&I focused on productivity growth; second based on health/life sciences linked mostly to University research
<b>Bioeconomy Ecosystem</b>	Scattered and diverse; small number of high-quality R&I actors, usually linked to University centres of excellence; majority of bioeconomy companies in lower tiers of value chains or oriented at regional/national markets;
<b>Bioeconomy Policy Support</b>	No particular bioeconomy aimed support; cross-cutting and general innovation support available; bioeconomy competes with other domains
<b>Successful initiatives and Good Practices</b>	Centres of Excellence funded from ERDF concentrated research teams and provided basis and stimuli for further growth. National programme of Centres of Excellence.
<b>Main Needs, Gaps and Bottlenecks</b>	No particular bioeconomy strategy or schemes; bioeconomy competes regionally and nationally with other domains; lack of entrepreneurship and weak commercialisation (general for the Czech innovation ecosystem); scattered and small bioeconomy sector making it difficult to concentrate resources.

\* Source of the data: S3 – Regional Viewer: <http://s3platform.jrc.ec.europa.eu/synergies-tool>

\*\* Data collected by this Study project in Task 1.

## 2. Regional Bioeconomy Ecosystem

### 2.1 Origin of Interest of the region in the Bioeconomy

Bioeconomy in Olomouc region has a long tradition but has been changing significantly in the past decade. The region consists of two rather different natural sub-regions:

(i) Haná with fertile arable soils is important Czech agricultural area which gave rise to agricultural sector, related food industry and supporting services, such as breeding and cultivation services, and relevant research in this field. The importance of research and development services increases due to strengthening competition producers face at the European market and resulting push to productivity growth. Research services are provided by the University as well as by private companies.

(ii) Jeseníky Mountains and surrounding highlands have got a lot of forests and their industrial base includes companies specialised in wood production and processing. This sector is not that important for the regional economy and it is less developed, too. On the other hand there are about 25 construction companies of wooden houses which is more than the average of Czech regions and they are often located in a peripheral mountain areas providing jobs for local population.

Bioeconomy value chains in the two sub-regions, though different, are mostly business driven and based on local production factors. The companies are mostly suppliers (tier 1, tier 2) with few integrators producing goods for end customers. Out of about 400 companies (and number of microbusinesses) in the regional agro-food sector less than 20 firms invest in R&D regularly and the means are usually modest. Many other companies invest in various kind of innovation not officially declaring their R&D expenses.

The third bioeconomy domain, perhaps not yet important for regional economy, is based on and driven by the Palacky University in Olomouc. This domain is generally life-sciences, mostly focused on pharmacology, medicinal chemistry, biologically active materials as potential substances for drugs and on clinical research related to these fields. This domain is concentrated in the regional capital Olomouc but has got extensive national and international links rather than regional ones. It has been strengthening since early 90s but a substantial growth has been enabled by the support from the Centres of Excellence priority of the OP Research and Development for Innovation (2007–2013).

Another industry in the region which can be considered as bioeconomy is textile, formerly traditional industry but having suffered few declines since 90s. Currently it is represented by a few companies in clothing industry which are reviving on grounds of previous larger firms and its importance both, in regional economy and in R&I is limited.

## 2.2 Bioeconomy Stakeholders

**Palacký University Olomouc (UPOL)** has got 8 faculties of which Faculty of Science and Faculty of Medicine are relevant for bioeconomy. There are 3 main research centres at the University of which “**Centre of Hana Region for Biotechnology and Agriculture Research (CRH)**” and “**Institute of Molecular and Translation Medicine (IMTM, Biomedreg)**” are most relevant for bioeconomy. “**Regional Centre of Advanced Technologies and Materials (RCATM)**” is the third centre at the University with only partial concern with bioeconomy, namely with environmental topics such as use of nanotechnologies and materials for cleansing water, soils or environment inside buildings.

Palacký University is leading actor in the regional bioeconomy ecosystem and plays an active role in Medchembio cluster (see below). The Palacký University is active and has got application potentials related to bioeconomy as described below:

Key R&D topics	Main technology area	Industries and sectors using the technology
Organic chemistry and biochemistry, Cell and molecular biology, Translation and experimental medicine,	Active pharmaceutical components, Drugs (natural and synthesized) Plant biotechnology	Pharmaceutical Industry Cosmetics Chemical industry Food industry Agriculture for food industry and for chemical industry
Nanotechnology	Cleansing technologies	Eco-technology Energy

**Science and Technology Park**, part of the Palacký University is the location for innovative companies, providing business and research services, laboratories and access to University research infrastructure and University know-how. Among 41 companies located currently in the park 14 can be considered as bioeconomy ones, some of them being spin-offs from the University or start-ups originating at the University.

**University Hospital Olomouc** cooperates closely with the University research teams and runs numerous clinical research studies, particularly in therapy of cancer diseases based on University research (but not limited to it).

**Medchembio, z.s.p.o.** is a **cluster** in medicinal chemistry and chemical biology which aims at promoting research and development in these fields with particular focus on biologically active ingredients, drugs and diagnostics. It consists of 26 members nationwide including local branches of international companies. Not all of them can be considered as bioeconomy actors as they are rather service providers<sup>1</sup>. Nevertheless its members include some of the best Czech R&D organisations such

<sup>1</sup> Event organising companies, translators, SW producers, etc...

as Institute of Organic Chemistry and Biochemistry or University of Chemistry and Technology in Prague. The cluster provides laboratories with 5 experienced staff offering analytical services mainly for pharmaceutical companies.

**Agritec, Research, Breeding and Services, Ltd.** It is a private institute focused on plant research of genetic resources of legumes, flax and hemp, the genetic and breeding research of fibre and technical crops and legumes and the research of growing technologies of technological crops and legumes. The company also cultivates and sells seeds.

**Institute of Cattle Breeding, Ltd.** (Výzkumný ústav pro chov skotu, s.r.o.) with its subsidiaries VÚCHS, Ltd. and Agrovýzkum Rapotín Ltd. provide research services in the field of cattle breeding and related fields (like quality of feed).

**OK4Innovations** is an association of several local actors (e.g. Regional Government, City of Olomouc, Universities, MechChemBio cluster) established in 2011 in order to implement Olomouc regional innovation strategy. It organises numerous events and actions, mostly networking or education and training activities.

### 2.3 Bioeconomy plans and projects

There is no specific strategy for bioeconomy, biotechnology or related topics in the region, bioeconomy topics are implicit part of other strategies. The strategy of the Palacky University is focused on biomedicine and biotechnology research, especially of cancerous/malignant and infectious diseases and their therapy. Part of the strategy were two major infrastructure projects (IMTM and CRH, full names see in section 2.2.) with corresponding research projects (see below in part 4). IMTM is the national node for EATRIS (European Advance Translational Medicine Infrastructure).

Apart from the University the strategic or programme support oriented directly or explicitly at bioeconomy is weak. There are two bioeconomy specialisation domains in regional RIS3 strategy: “**Biomedicine and Life Sciences**” and “**High-quality agriculture**”. No bioeconomy specific objectives or measures have been planned yet and no bioeconomy specific interventions or funding have been included in the RIS3 action plan until now.

Regional innovation strategy (document preceding RIS3 and partly different from it) includes “**Priority C. Services and support to innovative companies in key regional value chains**” which implicitly includes bioeconomy, not mentioning it. No information on the budget frame is available in RIS for bioeconomy specific interventions.

**H2020 projects.** There are 2 projects at the Palacky University one of them in bioeconomy field, **Solar Energy to Biomass (SE2B)** financed from MSCA-ITN programme, in which UPOL partner to coordinator J. W. Goethe University Frankfurt Am Main, Germany and 10 other partners.

**FP7 projects.** 17 projects were funded from FP7 in Olomouc region of which 5 can be regarded for bioeconomy field: **INFLA-CARE, SRPAS, LEGATO, NANOREM, QBOL.**

### 3. Bioeconomy Policy Support

#### 3.1 General support framework

Innovation support in Czechia is generally provided from the national level and it is mostly funded from the ESIF<sup>2</sup> and a few national programmes. The programmes (incl. ESIF OPs) and their strategies shall be consistent with the “National priorities of the oriented research, experimental development and innovations”. The “National priorities...”, support programmes and funding schemes or measures are not oriented at specific industry or sector or specialisation domain. Their focus is either cross-cutting, such as “support to commercialization of R&D results stemming from cooperation between academia and private sector” or “technology transfer” notwithstanding the industry, or rather broadly aimed such as “energy resources and environmental improvement” or “progressive technologies, materials and systems”. Specific focus, which will also govern the interventions of the OPs, is provided in the National Strategy of Smart Specialisation (National RIS3) describing specialisation domains for the Czech Republic. Regional annexes of this strategy (Regional RIS3s) elaborate some of the national domains in more detail or provide additional domains specific for a region.

Main actors at the national level are either ministries/managing authorities which manage relevant operational programmes or Technological Agency of the Czech Republic (TACR) which manages several programmes/schemes including support to oriented research, experimental development or collaboration between research organisations and private sector. Agriculture and environment related to rural development are dealt with by the Ministry of Agriculture, MA of the Rural Development Programme and of the EMFF OP. Both of the programmes include bioeconomy issues by definition yet they are mainly sectoral and not so R&I orientated.

At the regional level, which means NUTS 3 in the Czech case, the tools for supporting innovations are described either in previous regional innovation strategies or regional RIS3 annexes, which are specific strategic documents complementing the National RIS3, and in RIS or RIS3 action plans. Key actors at regional level are Regional Governments which in principle manage the innovation/specialisation strategies but the projects, schemes or support tools are

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<sup>2</sup> There are two ESIF operational programmes aimed at R&D&T support: OP Research, Development and Education mostly funding R&D in public sector, with the MA Ministry of Education, Youth and Sports and OP Entrepise and Innovation for Competitiveness funding innovation in private sector, with the MA Ministry of Industry and Trade. None of their strategie is sectorally focused.

usually organised by specific agency which overall purpose is either regional development or specific innovation support. Although the National RIS3 and their regional annexes specify specialization domains there are no functioning schemes yet aimed at supporting either a specific sector or a particular domain<sup>3</sup>. Sectoral or domain specific funding schemes are being prepared at the national level in the relevant OPs, though they will be aimed on all RIS3 domains with no specific focus on any particular domain<sup>4</sup>.

### 3.2 Bioeconomy Policy Support

There are no specific interventions aimed at bioeconomy neither at regional level nor at national level. Actors in the bioeconomy field participate in general R&I programmes and schemes at the national level and compete for funding with other applicants. For many factors and mechanisms of the innovation system are weak or underdeveloped in Czechia the national programmes aim at cross-cutting, overall innovation issues and are open for innovation actors from most industries or value chains.

The Science and Technology Park (STP) at Palacky University provides general innovation, technology transfer and business development services to companies and research teams notwithstanding their specialisation. However, as the bioeconomy related topics are rather important in the University research and education and two if the three centres of excellence are related to bioeconomy (and the centre undertakes some activities in this field, too) the programmes and projects of the STP are implicitly focused on bioeconomy actors and topics.

### 3.3 ESIF and H2020 resources for the Bioeconomy

Thematic objective 1 is supported by 2 OPs (OP Research, Development and Education, OP Enterprise and Innovation for Competitiveness) with the total amount of funds EUR 3948 million. There are no specific allocations either for a particular sector or domain in the OPs. Specific calls for proposals aimed at particular domains are being prepared by the MAs of the relevant OPs yet they will be national calls in which projects will compete from the whole country and among all domains specified in the National RIS3.

The regional R&I allocation from ESIF according to JRC calculation amounts EUR 382.7 million for the whole Central Moravia NUTS 2 region. The Central Moravia

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<sup>3</sup> The exception is the Regional Innovation Strategy and respective RIS3 annex to National RIS3 in Southern Moravia region which is explicitly focused on several domains including Life Sciences among others.

<sup>4</sup> Eg. Calls for Proposals: Excellence in research in generic knowledge domains identified in National RIS3 or Long-term intersectoral Cooperation or Research in pre-applied stage



allocation in 2014 – October 2016 for H2020 amounted EUR 4.2 million Total EC contribution to the Olomouc region from the FP 7 amounted 1.8 million EUR of which about 1 million EUR can be assigned to broadly understood bioeconomy field (incl. energy efficiency in housing). There are two H2020 projects in Olomouc region currently which amount EUR 2 million of which one bioeconomy project represents 116,000 EUR.

There have been several projects following the initial ERDF ones which established the research centres at Palacky University, some funded from ESF and the follow up research supporting project from ERDF 2014–2020. The Centres have also gained some other resources for research projects (see below in chapter 4).

The regional actors also participated in national schemes aimed at R&I support in general. Main resources were funds for applied research (Technology Agency of the CR) and for basic research (Grant Agency of the Czech Republic).

## 4. Successful Initiatives and Good Practices

### 4.1 Centre of Hana Region for Biotechnology and Agriculture Research (CRH).

The Hana Centre for Biotechnology and Agriculture Research (CRH) was established by Palacky University with two partners: Olomouc branches of Crop Research Institute and Institute of Experimental Botany (Czech Academy of Science). It was funded from ERDF by OP Research and Development for Innovations (national OP 2007–13) within its priority Centres of Excellence. The project started in 2010 by construction of the new premises and acquisition of the new equipment. From the beginning the Centre carried out specific research programmes, first in the facilities of project partners and since 2013 in the new premises. Part of the operational costs as well as funds for updating and new technologies are provided by the new OP Research, Development and Education within the project “Sustainability of Research Development at the Centre of the Region Haná”. Apart from the sustainability project operational costs are funded by more than 50 research grants which amounted about EUR 3 million in 2015 and from contractual research.

**Key objectives** of the project were to establish an internationally recognised research centre which would focus on transfer of research results to applications thus making bridge between academia and companies in agriculture, food sector or pharmaceutical firms. The Centre focuses on collaboration with Czech companies of which many are located in the Olomouc region though there are some foreign companies among them, too. Research teams in the centre also cooperate with other academic institutions in Europe, USA or Japan. The centre’s academic staff

guarantee some study topics at the Faculty of Science at Palacky University. The Centre is the Regional Branch Office of the European Biotechnology Federation (EFB) for the Czech Republic.

The Centre carries out research, provides services and expertise in the following research fields: protein biochemistry and proteomics, plant bioenergetics, chemical biology, plant biotechnology, cell and developmental plant biology, plant genetics and genomics, metabolomics, genetic resources of vegetables and special crops.

**Key research results.** The Centre research results are mostly publications in various journals or books. In 2015 the Centre researchers published or participated as co-authors of 144 papers and 3 scientific book chapters which is about 30% growth in comparison with 2014. Majority of papers were published in impacted journals with average impact factor 4,402.

**Key application results.** The University has gained through the Centre research teams 37 patents, utility models or prototypes since 2011, most of them shared with other companies or academia institutions. Out of these 16 patents are listed abroad (USA, Canada) or at the EU level. Although one of the Centre's objectives is cooperation with regional companies, it collaborates with companies from the whole Czech Republic (21 Czech firms) and with a few companies abroad (7 firms).

In 2015 the first project of its kind was completed at the Centre, which was 'New technologies in chemistry and biology' supported by previous ERDF OP for Research and Development for Innovations. The project was implemented in co-operation with the third Centre of Excellence at the Palacky University, the Regional Centre of Advanced Technologies and Materials. The project enabled to develop 3 technologies with commercial potential into technical feasibility stage with commercial potential assessed and intellectual property rights protected. These technologies are being offered to companies.

The Centre is strongly research oriented, applied research being still smaller part of the research activities. Its technology and application oriented activities are based on a long-term cooperation with companies and a few applied research firms in Moravia in the past. The growth of the application oriented research and commercial collaboration has been built on this past experience. The Centre brought to one institution researchers from various scientific fields. By providing top-level equipment and facilities the Centre attracted excellent researchers, improved conditions for international cooperation both, academic and commercial, and particularly provided stimulating environment to students at all levels thus offering them the faster growth in their scientific career.

The Centre has carried following international projects apart from numerous research projects funded by national grant agencies, namely Technological Agency of the CR and Grant Agency of the CR (for basic research grants).

- H2020, Marie Curie Actions (Innovative Training Network), SE2B – Solar Energy to Biomass – optimization of light energy conversion in plants and microalgae
- FP7-PEOPLE-2012-CIG, Structural response of photosynthetic apparatus to stress
- AKTION – Scientific and Technological Co-operation Programme Austria – Czech Republic,
  - 7AMB15AT011 Qualitative and quantitative analysis of the performance of pseudotrypsin towards protein substrates as a contribution to proteomics
  - 7AMB15AT004 Effects of strigolactone analogues on subcellular distribution of dynamic PIN proteins in Arabidopsis
  - 71p6 Honey bee colony losses in Austria and Czech Republic and relation to the bee immune system

Thus the centre's activities represent not only a successful bioeconomy specialisation but also are an example of combination of funds and strengthening of the applied research activities enabled by the initial ERDF investment in the centre of excellence.

#### 4.2 Science and Technology Park of the Palacky University.

The Science and Technology Park (STP) has been established in 2007 in cooperation between the Palacky University, Regional Government and City of Olomouc. Formally the Park is an independent unit within the Palacky University. In order to strengthen regional competitiveness through innovation the STP promotes R&D results of the University research teams, facilitates access to research infrastructure and research teams of the university for business actors, supports technology transfer for the University and provides services to businesses in the field of innovation. The mission of the STP is to create bridge between research and businesses thus to support innovation in private sector and to facilitate commercialisation of university research outcomes.

Although the focus of the Park is on innovation in general, its activities are strong in bioeconomy because the University has got strong research in this field and two centres of excellence provide opportunities for commercialisation in bioeconomy. About third of the companies located in the Park are specialised in bioeconomy, as well as part of the laboratories in the Park's **Centre of Applied research**. The biotech companies therefore represent the largest sector in the Park and are frequent part of the Park's programmes.

The STP in Olomouc was also supported by the two projects from the OP Enterprise for Innovation 2007–13 (ERDF). Its programme **Prosperity** which provided grants to developing of business and innovation infrastructure funded two development

projects of the Park. Currently, new development of the Park premises is being prepared. The operational costs of the Park are funded by the lease of the premises, by providing services to external actors and partly by the annual grant from the University.

The Park offers several programmes for businesses and administers an **Innovation Vouchers scheme** on behalf of Regional Government, funded from ERDF (ROP Central Moravia) in the past. The STP programmes include: UP Business Club (training, networking and exchange of experience programme), UP Business Consulting (aimed mainly at business start-ups), UP Business Centre (renting offices, laboratories, co-working space, premises for pilot production), UP Business Catapult (special programme combining mentoring, consulting and rental of premises and facilities for subsidised price aimed at particularly promising projects).

The STP technology transfer services were listed in the upper third among the members of the Czech CTT organisation Transfera.cz according to financial means of collaborative research and revenue from licenses in 2014–15.

The STP provides **Proof-of-Concept** services within the project funded by the programme GAMA of the Technology Agency of the Czech Republic, **Intellectual Property Rights** services as part of the Innovation–Patent project funded by the ERDF supported programme Innovation (from the OP Enterprise and Innovation for Competitiveness 2014–2020).

Bioeconomy companies located in the Park cover wide array of specialisation fields, such as PlanetCare – **production of the EcoTwin Bags** (dual trash bags) for economic and ecological sorting of household waste, Hopsinki – production of **human and animal nutrition supplements**, **biotechnology companies** BioApex – discovery, development and commercialization of novel, mechanism-targeted drugs to treat serious cell cycle related disorders or BioPatterns – identification and characterisation of new low-molecular organic substances with potential therapeutic use, and many others. Most but not all of these bioeconomy specialised companies are start-ups or spin-offs from the Palacky University.

The case represents an example of synergies of various sources of funding arising from the institutional arrangements at the Palacky University as well as synergies between activities of multiple actors active in the field of bioeconomy and outside of this particular specialisation in general R&I support. The research facilities were strengthened by using ERDF funding in 2007–13 and funding is continued in the 2014–2020 period (centres of excellence), the capacities of the research teams (applied and fundamental research) have been supported by ERDF, FP7 and H2020 as well as national programmes while the commercialisation, transfer of technology and business support (start-ups, spinoffs, incubation of companies outside the

university) have been supported by the combination of ERDF and national funding schemes within the Science and Technology Park. Although there is no explicit bioeconomy strategy of the region or the University, the bioeconomy support is implicit in this financial and organisational arrangement due to strong bioeconomy research at the University.

## 5. *Needs, Gaps and Bottlenecks to Deploy the Bioeconomy*

The needs, gaps and bottlenecks to strengthen bioeconomy and its R&I are similar to those of innovation ecosystem in Czechia in general. First, there is lack of programmes aimed at specific domains due to underdeveloped innovation ecosystem and generally weak knowledge economy. Therefore the Czech interventions in the innovation field are mostly of the “horizontal” nature, not targeted to a specific domain, sector, industry or research field/topic. Second, there is a long-term mismatch between research carried out at public research organisations and needs of companies. The companies mostly require low-end research activities such as tests, measurement which the research organisations are not usually interested in. Third there is a lack of strong, market or technologically leading companies or companies which are close to the top-level in their particular field and many companies are tier 1+ suppliers which inhibits their innovation/research demand. The specific gaps and bottlenecks in bioeconomy in Olomouc region are as follows:

**Insufficient specialisation of the regional economy** in general which leads to a small bioeconomy sector; it leads, among others, to difficulties in identification potential actors for clusters in this field and generates low regional demand for research from research organisations, such as University centres/institutes.

Despite specialisation in agro-food **the number of private actors engaged in innovation activities is small and their production specialisation within agro-food sector is scattered**. This makes it difficult for the university/applied research to cooperate with regional actors and it leads to generally weaker links between the research and the business sector.

There is lack of innovation demand among companies. Most actors in bioeconomy are locked-in in the lower levels of value chains or are small (in national or international context) with limited resources for research and innovation and, particularly, with **limited potential for innovation other than technology one focused on cutting production costs**. The needs of companies are different from the focus (and often high-quality) of research at the University.

**Small number of bioeconomy companies close to final markets** (end consumers), with these final markets usually small, regional or national ones. This causes fewer opportunities for product innovation and thus for growth.

**Difficulties in combining the resources** from various OP or administrative obstacles in seeking synergies of ERDF and other R&I programmes, national or international ones.

Despite a few spin-off and start-ups in bioeconomy **the interest of the academic sector in commercialisation or of the students/post-docs in independent business career is weak.**

**Lack of programmes or schemes explicitly aimed at bioeconomy** support, both regionally and rather weak nationally despite the smart specialisation strategy.

## 6. Information Sources

### Literature and Documents:

Czech National Research and Innovation Strategy for Smart Specialisation (National RIS3, Národní výzkumná a inovační strategie pro inteligentní specializaci), Office of the Czech Government, 2016, Prague

National Priorities of Oriented Research, Experimental Development and Innovation (Národní priority orientovaného výzkumu, experimentálního vývoje a inovací), Government of the Czech Republic, 2012

Regional Appendix of National RIS3 for Olomouc Region (Regional RIS3, Regionální příloha RIS3 Olomouckého kraje), Olomouc Regional Government, 2014, Olomouc

Proposal of Instruments to Implementing RIS3 for Olomouc Region (Návrh nástrojů RIS3 Olomoucký kraj), 2014, Olomouc

Regional Innovation Strategy for Olomouc Region (RIS), Olomouc Regional Government, 2014, Olomouc

Annual Reports of the Centre of Hana Region for Biotechnology and Agriculture Research, 2014, 2015.

RIS 3 Implementation strategy, Office of the Czech Government, 2016

Overview of Technology Transfer Centres in the Czech Republic (Přehled pracovišť transferu technologií v České republice), Transfera.cz, 2016.

### Relevant websites:

<http://www.cr-hana.eu/en/>

<http://www.veda.upol.cz/en/>  
<http://www.umtm.cz/about-us>  
<http://www.medchembio.org/>  
<http://www.vtpup.cz/en.html>  
<http://www.ok4inovace.cz/>  
<https://www.fnol.cz/>  
<https://www.vuchs.cz/vyzkumny-ustav-pro-chov-skotu/index.php>  
<http://www.agritec.cz/en>  
<https://www.elixir-czech.cz/>  
<http://s3platform.jrc.ec.europa.eu/synergies-tool>  
<https://ec.europa.eu/research/regions/index.cfm?pg=soe>  
<https://ec.europa.eu/research/pdf/publications/ki-01-16-339-en-n.pdf>  
<http://s3platform.jrc.ec.europa.eu/country-region-information>  
<http://s3platform.jrc.ec.europa.eu/synergies-examples>

#### Interviews and Contact details:

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Veronika Czesana	R&D specialist for RIS3 in dept. of Concepts and elaboration of Calls for Proposals of the OP RDE	Ministry of Education, Youth and Sport, MA of the OP Research, Development and Education (OP RDE).	+420 773 85 0 715	veronika.czesana@msmt.cz	1.12.2016
Jiří Herinek	Director of the S&T Park	Science and Technology Park at the Palacky University, Olomouc			9.12.2016