

Potential impact

In the CELIM project four important impacts have been declared:

1. Better integration in the European Research Area

At July 1st, 2013, the Center for interdisciplinary biosciences (CIB, <http://www.cib-center.org/en/home>) has been established at the Faculty of Science, P. J. Safarik University in Kosice, Slovakia, as a purpose-build institution for the CELIM project implementation. This step was very important from the point of view of the unambiguous identification/recognition of the CELIM consortium. Immediately after its creation, the CIB applied for a membership in the pan-European infrastructure network – Euro-BioImaging (EUBI, <http://www.eurobioimaging.eu/>), as the leader of a newly created Slovak bioimaging network (SkBIN, <http://www.skbs.fmph.uniba.sk/bioimaging/>) (Fig.1)

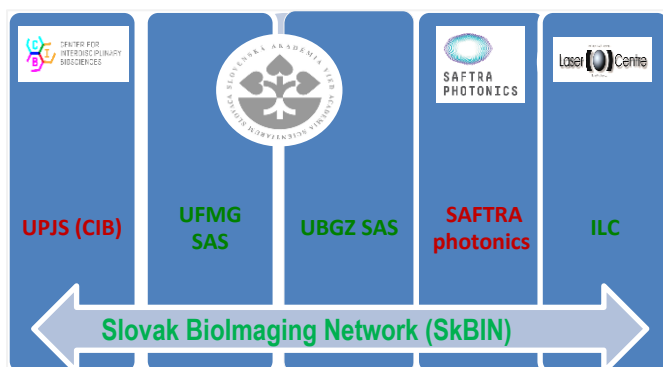


Fig. 1 Members of the Slovak Bioimaging Network

After the long-term (three years) complicated negotiation process, the SkBIN passed through the ratification process (November 2015) and has been accepted as a member of the EUBI.

In addition, the scientific collaboration between the consortium partners has led to a preparation of a common H2020 project dedicated to the development of nano-delivery system for a targeted anticancer drugs delivery. The project, sent to the FETOPEN call, passed all the thresholds, but was not supported, because the success rate of the call was only 1.6%. Recently, we are looking for other possibilities for the project re-submission.

Our collaboration and long-term partnership with the partners of the CELIM project resulted in the planning of the application for the education and training of our PhD students abroad. Recently, we are preparing H2020 project in the MCF funding scheme dedicated to double diploma programs. In this project we would like to profit from our experience in the organization of double diploma programs in collaboration with some of our project partners (UPMC Paris and IEM CSIC Madrid), as well as from our long term activity in the organization of summer schools in Biophotonics for PhD students at UPJS (<http://www.biophysics.sk/sk/event/25/s-k-o-l-a-b-i-o-f-o-t-o-n-i-k-y-2016>).

All the above mentioned activities assure the long-term perspective and sustainability of our participation on different research, teaching and organization activities in the ERA.

2. Upgrading the RTD capacity and capability (human potential: number of new researchers and training of research staff, improvement of scientific equipment) as well as the quality of research carried out by the selected research entities.

As it was proposed in the project description, the CELIM project has upgraded the RTD capabilities of the applicant team in human potential, equipment, and mutual transnational knowledge exchange between closely collaborating leading teams across Europe. Briefly:

The applicant team hired 6 skilled world-class experienced scientists in different Bio- and ICT fields. Five of them have obtained a work position at the UPJS, concretely, in the CIB institute. Thus our research, educational and organization activities can continue even beyond the EC financial support. Our CIB team has a perspective for an ambitious development with the aim to become really competitive in ERA in the field of biomedical research.

As it was mentioned in the periodic report and several deliverables (mainly connected to the WP4) four state-of-the-art laboratories have been constructed for the hired scientists. Together with the resources from the EU Structural funds, we have constructed a chain of modern laboratories in the CIB (Fig.2). Furthermore, with the help

of our partners in the project, we have implemented new research lines into the CIB research activities (mainly protein and medical-engineering).

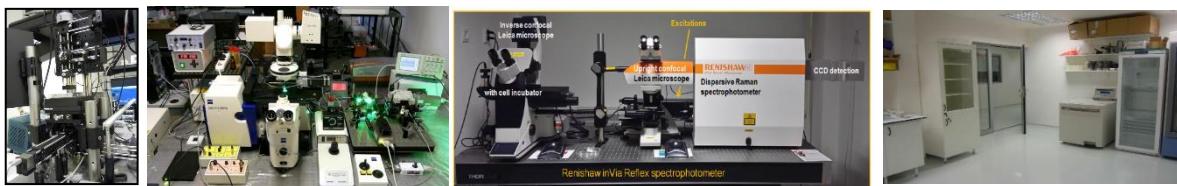


Fig.2 Part of the CIB laboratories constructed in the frame of the CELIM project.

In addition, our collaboration with XFEL help us to prepare a competent “X-ray imaging” oriented team for a future XFEL activities.

Taken together, highly experienced and skilful personnel in a combination with modern up-to-date equipment, boosted with meetings with the excellent Western partners for training, know-how exchange and joint collaborative work, already helped us to achieve top-ranking scientific performance within ERA and beyond.

3. Improved research capacity for increased contribution to regional economic and social development.

Regional economic and social development was in the center of our activities for whole period of the project implementation. Besides of our usual and historically well-organized study in biophysics and biochemistry, which continuously **has prepared** very competent PhD students (we have a long term tradition in double diploma doctoral studies with our partners from the west European countries), as well as a regular organization of the School in Biophotonics (<http://www.biophysics.sk/en/event/25/s-c-h-o-o-l-o-f-b-i-o-p-h-o-t-o-n-i-c-s-2016>), which is recently recognized by reputable international science organizations (EBSA - <http://ebsa.org/portal/> and EUBI - <http://www.eurobioimaging.eu/>), we have concentrated our activities also **to create a real collaboration** with high-tech industry and to prepare conditions for technology transfer of our results obtained in basic research to a practice **via creation of our start-up company**.

I. **Collaboration with a high-tech industry:** We have implemented a common project with Shimadzu Austria Ltd. company in the frame of the European structural funds.

- Project title: Fundamental study of immunomodulation activity of cytokines in different stadiums of psoriasis development (IfNG)
- Budget: č,136 M€

Results:

- ✓ Construction of common laboratories in Bratislava (Slovakia)



- Lab of microbiology
- Lab of mass spectroscopy
- Lab of biotechnology



- ✓ Preparation of the second phase of the common project for next 5 years (recently in the evaluation process)

II. **Creation of start-up company SAFTRA photonics Ltd.:** SAFTRA photonics Ltd (<http://www.saftra-photonics.org/en/home>) has been created in 2014 with the aim to transfer our results obtained in the basic research to an application phase:

Results:

- H2020 SME instrument project entitled “Disruptive portable device for pre-screening of Persistent Organic Pollutants –POPs- in food products and water” – Phase I, has been attained and supported. Recently the Phase II of the project has been submitted for the evaluation
- If supported, the project could create up to 22 new job position 5 years after its commercialization and revenue is expected to be about 5 M€.

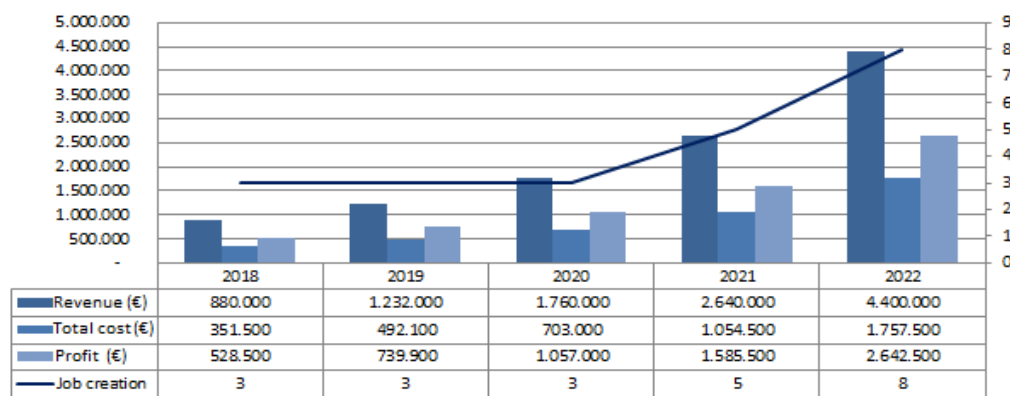


Fig. 3 – Expected impact in SAFTRA photonics Ltd

The real potential for the technology transfer *via* the SAFTRA photonics company is manifested by the number of signed memorandum of understanding and NDA with different high-tech societies over the world:

- ✓ 4 NDA signed with 2 companies from Japan, 1 from Germany and 1 from the Czech Republic
- ✓ 2 investment agreement signed with investors from the Slovak Republic

Taken together, we can expect that our activities in basic research performed in the Center for interdisciplinary biosciences as well as in the applied research end technology transfer which are associated with the Shimadzu Austria and our start-up company, have a real chance to support economic as well as social development of the Eastern Slovakia region and maybe also could have important impact also on the national level.

4. Improvement of participation of the Applicant entity in FP7 projects.

Our activities in this field are demonstrated in the table:

Project title	Call	PI	Submission	Result
DARPin-LDL complexes as innovative drug delivery vehicles in targeted photodynamic therapy	FP7 – MCF PEOPLE-2013-CIG	Erik Sedlák	2013	not awarded
Proton pumping by ferryl intermediates of heme-copper oxidases	FP7 – ERC	Mariáj Fabián	2014	not awarded
INNOVATIVE DARPINS-LDL DRUG DELIVERY VEHICLES FOR TARGETED CANCER THERAPY	Quatar national research fund	Peter Kasák	2014	not awarded
Towards highly selective and personalized cancer treatment: DARPin – endogenous LIPoprotein complexes as a new generation of targeted drug delivery vehicles (DARLIP)	H2020-FETOPEN-2014-2015-RIA	Andreas Plückthun	2015	not awarded (passed all thresholds)
Disruptive portable device for pre-screening of Persistent Organic Pollutants –POPs- in food products and water	H2020-SMEINST-1-2015	Pavol Miškovský	2015	Awarded (Phase I)

Thus, at the present time, the Applicant team has been awarded only with one EU H2020 project. On the other hand, with the project DARLIP sent to the FETOPEN, we have passed all thresholds. We have not been awarded because of a very competitive call with just 1.6% of the success rate. Recently, we are preparing the re-submission of the DARLIP project.

5. Dissemination activities and exploitation of results

The main objective of dissemination activities was to provide the means either for full public dissemination, or for a targeted information exchange with potential commercial partners or customers.

The dissemination activities and methods were selected in such way that they were able to address various target groups:

- scientific community,
- commercial partners and investors,
- management of the academic institutions and grant agencies,
- local and regional management,
- media and the general public.

The following table summarizes and quantifies main dissemination outputs:

Activity name	Target groups	Number of activity instance
Web page	General public	1
Videos/Video channels	General public	7/1
General meetings	Scientific community, academic management, media, commercial partners, investors	2
Scientific workshop/conferences	Scientific community	5/1
Meeting of Advisory Board	Commercial partners, local and regional government, university management, management of grant agencies	2
Scientific publications	Scientific community	46
Invited lectures, talks at conferences, workshops, doctoral schools, seminars, posters	Scientific community	25+
Interviews/articles in public media	General public, commercial partners	5/10+
Award	Management of the university, grant agencies, scientific community, general public	1
Promo materials	Scientific community, general public	N/A

Our main dissemination channel has been the webpage of the project. The Webpage of the project CELIM is operating from the middle of June 2013 at the following URL: <http://celim.science.upjs.sk>. The part of the webpage is depicted at Fig. 4.

The webpage contains:

- general information concerning the project, involved person and partners
- regularly updated information including:
 - ✓ dissemination in various media
 - ✓ recently installed equipment and developed methods
 - ✓ list of the organized project workshops
 - ✓ list of the published scientific papers.

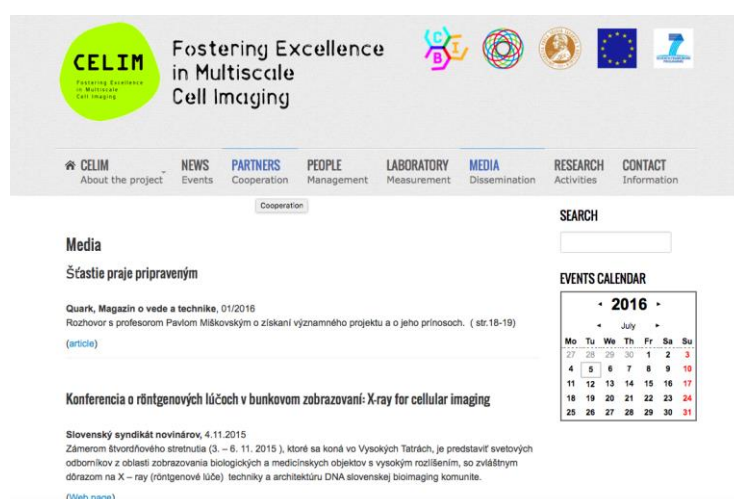


Fig. 5. The webpage of the CELIM project

Remark: All dissemination materials (videos, articles, propagation materials...) are available on the project webpage.

During the project implementation we have realized various meetings and negotiations with our present and potential collaborators and representatives of the town and regional government, grant agencies and investors. Some of the discussions with them resulted to NDO signing. The most important partners are:

- Shimadzu Europe, Ltd., Austria, Slovakia,
- New Vision Biomedical Ltd, Slovakia,
- METAWATER, Japan (signed NDA),
- INSPIRALIA Spain (signed NDA),
- RECETOX, Czech Republic,
- SURFACE nanometrology GmbH, Germany
- Slovak Business Agency, Slovakia.

The visibility of the project was supported also by stationary propagation materials distributed to the partners (for details see D5.3).

All the promotional materials and presentations are designed in a common presentation style as it is shown for the Final meeting announcement (**Fig.6**).



Fig.6: Final Meeting poster

Other dissemination channels and activities during the project duration were :

- press releases
- special YouTube channel for CELIM project
<http://www.youtube.com/channel/UCb63g0Vq4O0q8xAlKtQWfjw>
- related articles in public media
- interviews in mass media
- award of Prof. Miškovský (scientist of the 2014 year of the Slovak Republic) – covered by more 10 public medias and webpages

- promo of scientific results
- talks and posters at scientific conferences, workshops and business meetings.

We have organised two meetings of the Advisory Board of the project. The following members of the Advisory Board were presented:

- Renáta Lenártová, vice-major of Košice city
- Peter Ťapák, representative of Košice self-governing region
- Pavol Dubinský, a member of the Board of Directors and head of the Radio-oncology division, East Slovak Institute for Oncology
- Miroslav Karaffa, chairman of regional chamber of Slovak Chamber of Commerce and Industry
- Roman Oros, representative of Shimadzu Ltd.
- Pavol Jarčuška, vice-rector of P.J. Šafárik University

Even if the AB was not really helpful for the whole project duration, the decision making personalities in the AB have been informed about our activities. For them mainly our possible activities in the field of the technology transfer were interesting and they expressed their intention to help us with the implementation of our most promising results. However, only the future will show if this is realistic.