A summary description of the project context and objectives

WP1 Recruitment

The main objective of WP1 was to identify, attract and reintegrate skillful and renowned Slovak researchers working abroad, specialists in identified areas of research needed for the future development of the CELIM consortium. The fulfillment of this objective should significantly improve quality of a research in interdisciplinary life sciences at P.J. Šafárik University in Košice (UPJŠ), and by this way a substantially increase involvement of established and highly experienced international partners (academic and commercial) to sign official research applications with us and/or to invest their own resources and personnel to mutual collaborative projects. As it has been shown in D.1.7 – *"Final report on the research activities and results of the hired researchers"*, this main objective of WP1 has been fulfilled. We can state that the hired personnel of the project CELIM form a core of the bio-science research at UPJŠ and the fact, that five of six scientists will continue in their scientific effort at UPJŠ also after the CELIM project, is a good sign of a successful story of this project.

In accordance with the description of WP1- Recruitment, the hired personnel were formally divided into two groups: experts in biology-physics (BIO+PHYS) field and scientists hired for computation-simulation (COMP-SIMUL) disciplines. The experienced researchers hired for BIO+PHYS were Dr. Erik Sedlák (protein engineering), Dr. Veronika Huntošová (time-resolved optical spectroscopy) and Dr. Marián Fabián (bioenergetics) and for COMP+SIMUL field Dr. Tibor Kožár (computational modeling, visualization and interactive manipulation of massive volumetric data of biological nature), Dr. Denis Horváth (computational modeling of coherent X-ray diffraction imaging) and Dr. Oxana Musatovová (cellular and molecular biology).

A) New collaborations:

The expansion of the CELIM team by hiring of six experienced scientists has led to the creation of new collaborations:

- University of Zurich (Switzerland)
- Nagoya University (Japan)
- East China University (China)

and strengthening of the already existing international collaborations:

- EPFL Lausanne (Switzerland)
- Stockholm University (Sweden)
- XFEL, Hamburg (Germany)

B) New national/international projects:

The hired scientist actively participated in the preparation of 10 scientific projects during the last three years. Four of these projects are financed (national grant agencies: www.apvv.sk, https://www.minedu.sk/vedecka-grantova-agentura-msvvas-sr-a-sav-vega/) and in two of them a hired scientist (Dr. Sedlák) is a principal investigator.

In the frame of these collaborations (mostly with University of Zurich and EPFL Lausanne), a grant proposal with a title "*Towards highly selective and personalized cancer treatment: DARPin-endogenous lipoprotein complexes as a new generation of targeted drug delivery vehicles (DARLIP)*" within FET (Future and Emerging Technologies) open Horizon 2020: Call FETOPEN-2015-2015-RIA, proposal No. 712917) has been submitted. This project has passed all thresholds, but the final score was not enough for a financial support (final score 12). It has to be mentioned that the success rate of the call was just 1.6%. A new submission of the project is envisaged in for new H2020 calls.

C) New laboratories construction:

The new hired scientists have founded four new laboratories at UPJŠ (see the Center for interdisciplinary biosciences webpage: http://www.cib-center.org/en/home). The laboratories are localized in the Center for Interdisciplinary Biosciences, Safarik University in Kosice – see description of the WP4 for details.

D) Publication activity:

The publication activity of the CELIM team has been clearly intensified by the presence of the hired personnel. Altogether, these scientists contributed to 23 publications (18 already published, 1 accepted, 4 submitted) during the CELIM project. Moreover, the averaged impact factor of the journals, where CELIM team publish scientific works, has increased from IF=2.7 in 2013 to IF=3.3 for works published in 2014-16 years.

E) Collaboration with industry:

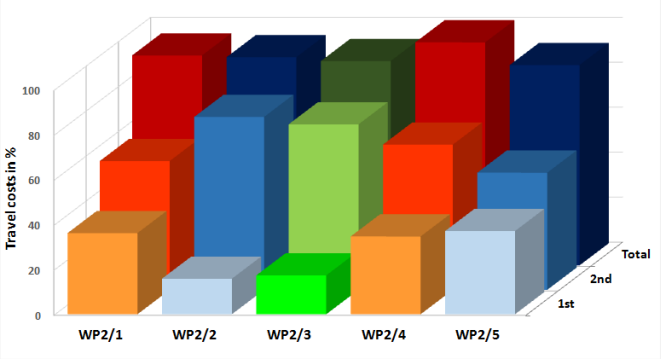
In the field of collaboration with an industrial partner, the CELIM team (with the main contribution of the hired researchers, mainly dr. Sedlák) has prepared a collaborative project with the worldwide known company Shimadzu Ltd. The project entitled: "*Fundamental study of immunomodulation activity of cytokines in different stages of development of psoriasis*" (budget 4.218.108 EURO) is devoted to create interdisciplinary and international center of excellence oriented to sophisticated biomedical research. The research goal is to define and experimental test of modification of recombinant human protein hrIFN-g in a process of design of new bio-drug/biomedicine. In the frame of this project, a new common laboratory with the Shimadzu society has been established in Bratislava (Ďumbierská 3, Bratislava). The Shimadzu society invested in the laboratories reconstruction and the CELIM team invested in the purchasing of a new equipment (a total infrastructure investment of 2.320 k€).

F) Conclusion:

In the context of the project proposal, we can conclude that the outputs of the activities within WP1 significantly contribute to the accomplishment of the main goal of the project, to enhance capacity of the CELIM team to successfully participate in biomedical research at the EU level and to create a team capable of sustained funding from public and/or private resources.

WP2 – Know-How

The main objective of the WP2 was to strengthen and expand the collaborations between CELIM coordinating organization (UPJS) and top class scientists from partnering organizations to ensure high quality research and increase the participation of CELIM in biomedical research within ERA



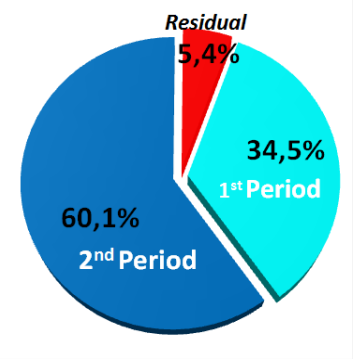


Fig. 1. Statistics of the budget for travel costs

The main goal of WP2-Know-How has been fulfilled. ***94,6 %*** of the total WP2 budget has been spent during the project duration. For more detail see the statistics on **Fig. 1**. The prepared and by EC approved detailed plans for incoming and outgoing secondments have been followed and realized successfully. We have performed in total ***185 travels*** (*52 incoming*, *133 outgoing*) between Projects partners, which represents ***78,3 PM*** in total – *63,5 outgoing* and *14,8 incoming* PM. For a more detail see the statistics on **Fig. 2**. All the changes in the performed secondments have been approved by the EC (project manager) and did not influence the approved project budget.

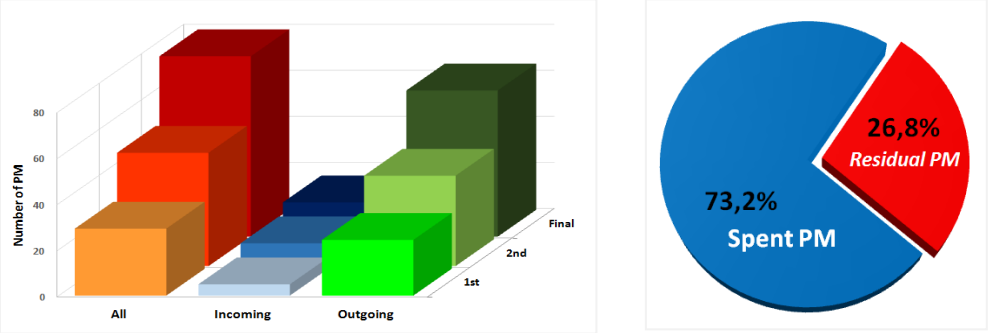


Fig. 2 Statistics of the accomplished secondments – PM

WP3 – Meetings &Training

The main goal of the WP3 - Meetings & Training was to collect valuable pieces of a novel know-how in WP2, ensure the circulation of the project knowledge within the consortium and present the results and ideas on workshops and meetings with other scientific and industrial partners.

The main goal of WP3-Meetings & Training has been fulfilled. We have organized 9 workshops in different fields of expertize involved in CELIM with the aim to discuss scientific results of the CELIM consortium and possibilities for a preparation of other joint EU projects and transfer of research results to industrial applications (**Fig. 3**). Majority of workshops was completed on time, except "Workshop on Structural Biology" and "Workshop on Mining Complex Data", which were realized ahead on schedule with respect to other obligations of partners and their disposability. "Workshop on Structural Biology" was organized (III/2014) as a part (a) of the 3rd "Winter school of synchrotron radiation". One additional workshop ("Workshop on Surface Enhanced Raman Spectroscopy – applications in environment monitoring") was organized in Madrid (Spain). The main reason to organize "*ad hoc*" additional ws was to prepare a work plan for the NanoScreen proposal. Nano-Screen (Nano-Sensing for persistent organic pollutants) is the first proposal from CELIM consortium prepared in the frame of H2020 SME calls and was recently sent to EU portal project No 663040). All changes in the ws organizations have been approved by the EC (project manager) and did not influence the approved project budget.

During the second period of the CELIM project, the main goal of the workshops was a preparation of the activities within the SkBIN initiative and its incorporation into the European network of excellence – Euro-BioImaging network- EuBI (www.eurobioimaging.eu).

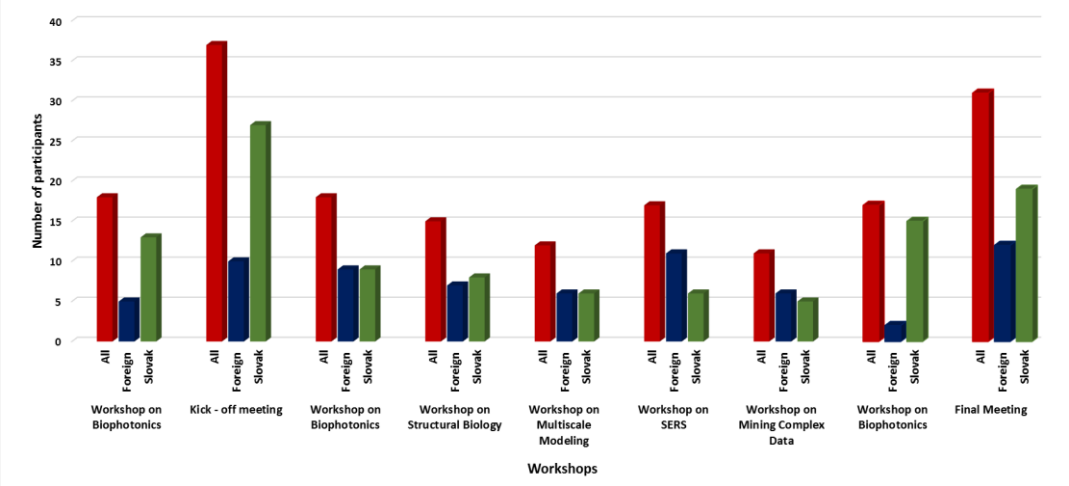


Fig.3. Workshops organized in the frame of the CELIM project – statistics of the attendance

WP4 - Equipment

The main objective of WP4 was to upgrade the current equipment of the CELIM consortium for the needs of future experiments to be performed in the area of a biomedical research. All tenders for equipment purchase were prepared and opened in agreement with the project timetable. All of the purchased equipment and instruments were installed on-time and in conformity with the project schedule (period 1-18M).

The CELIM consortium had in disposition before the project a modern instrumentation in biophysics, optical spectroscopy and microscopy, molecular biology, cell physiology and computing. The project CELIM helped to complete and upgrade the infrastructure by the purchase of instruments with the aim to reinforce CELIM capacity for highly specialized experiments and computational simulations. This instrumental upgrade was described in detail in the "First period report" and corresponding deliverables, and resulted in a creation of four new "state-of-the-art" laboratories in the CELIM consortium:

- Laboratory of protein engineering (E. Sedlák)
- Laboratory of bioenergetics (M. Fabian)
- Laboratory of FLIM/PLIM (V. Huntošová)
- Laboratory of computational modeling and visualization (T. Kožár)

These laboratories, together with the already existing infrastructure of the CELIM consortium, make us a relevant and trustworthy partner to be considered for an involvement in highly ambitious European projects and scientific networks (e.g. EuroBioImaging http://www.eurobioimaging.eu/).

WP5 - Dissemination

The main objective of WP5 - Dissemination 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 a 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 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

WP6 - Management

The main objective of the WP6 was to manage, synchronize and report the activities of individual participating organizations. All these managerial duties have been performed by Project management team including Project coordinator, WPs coordinators and PAO.

All tasks in the WP6 have been fulfilled and led to the most important project result - **SUSTAINABILITY.** The sustainability of the project beyond the EC financial support is expressed by:

1. Creation of a new institute at the University of P. J. Safarik: Centre for Interdisciplinary Biosciences (CIB: www.cib-center.org)
2. Creation of the spin-off company: SAFTRA photonics Ltd: www.saftra-photonics.org and preparation of the second start-up SAFTRA Imagine
3. Creation of the Slovak Bioimaging Society: http://www.skbs.fmph.uniba.sk/bioimaging/
4. Creation of a collaboration with a high-tech private company Shimadzu Slovakia Ltd.: common biotechnological project devoted to development and commercialization of new drugs against autoimmune diseases
5. Acceptation of the CELIM team (CIB institution) as a member of the European network of excellence EuroBioImaging: http://www.eurobioimaging.eu/