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BioQantSense

**Twinning for excellence of the Serbian Research Center
for quantum biophotonics**

Work Package 2

Knowledge and skill transfer / exchange

Deliverable 2.1

**Implemented measures and processes to improve
and strengthen IPB capabilities**

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1. Context information

1.1 The BioQantSense project

The BioQantSense project objective is to raise the excellence and reputation of the Institute of Physics Belgrade (IPB) in all scientific, management, and administrative aspects relevant for international R&I activities. In this context, the emerging scientific field of quantum biophotonics will be systematically developed and all aspects of classical biophotonics are going to be significantly improved. The final goal is to establish a quantum biophotonics center at IPB, with scientific excellence and a research light house character. This development will be a result of a tailored institutional strategy for IPB and knowledge transfer through strategic networking with two high-profile European partners, Friedrich Schiller University Jena (FSU) and the Italian National Research Council (CNR).

Quantum bio-photonics is an emerging field for ultra-sensitive and reliable measurements in a wide bio-environment since classical metrology cannot successfully meet the increasing demand for higher sensitivity. Bio-photonics is a concrete, multidisciplinary scientific field with potentially high-impact applications in medicine, pharmacy, agriculture, environmental protection. Therefore, it is crucial that an institutional strategy should include a tailored scientific strategy addressing this specific scientific field. A scientific exploratory project will include the development of all relevant methods and practices learned from the European partners. A long-term partner of IPB, the Faculty of Biology at the University of Belgrade, is included to help IPB biologists in choosing, preparing and cultivating suitable biosamples. In particular, the project consortium is pursuing the following project goals regarding the expansion and strengthening of the resources and know at IPB:

- i) developing a short-term institutional strategy including excellent research at IPB based on strong development of quantum biophotonics,
- ii) improving management, administration, and organization skills in IPB.

To achieve the BioQantSense objectives, a work plan of the project divided into five Work Packages (WPs) was developed (Figure 1):

- WP1 is devoted to development and implementation of scientific and management strategy on increasing reputation and visibility of IPB. The development of the short-term strategy will start in M1, while the long-term strategy for sustained scientific excellence and administration skills will be finalized at M36.
- WP2 will be focused on raising the research capacity of IPB through a large number of short-term and long-term visits, trainings, lectures, seminars, hands in experiments.
- WP3 defines dissemination and communications activities that will target scientific community, national and international stakeholders, as well a wider audience.
- WP4 is for project management that will lead the work of the consortium to achieve all project goals.
- WP5 Exploratory project, the research project of the BioQantSense.

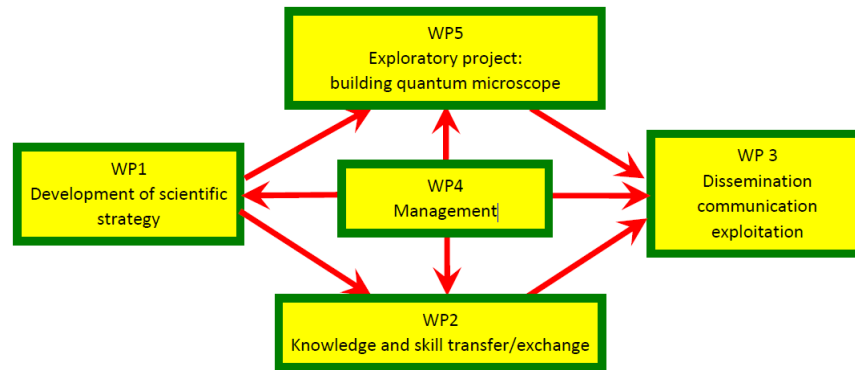


Figure 1. Graphical presentation of the Work Packages (Pert chart).

2. Summary of the deliverable

Although the achievements and scientific excellence which IPB has already demonstrated in the past years, the IPB and the IPB’s Photonics center (PC) have undertaken a series of actions and implemented a number of measures in order to improve scientific and management capacities based on the identified gaps in D1.1 Benchmark analyses and recommendations given in D1.2 Report on recommendations.

Given the historical, scientific or economic aspects of IPB at the regional and national level, the D1.2 recommendations are, as said in the Deliverable, accepted as general observations and suggestions and implemented in accordance with the IPBs 10 years Transformation Strategy, IPB Strategy & Action Plan, and existing HR & work capacities.

2.1 Description of the Work Package concerned

WP2 aims to increase the scientific excellence as well as to strengthen relevant professional skills of IPB for administration and management in international, multilateral R&I projects. The WP foresees development and implementation of the 13 tailored measures, both on scientific and administrative level in order to achieve the WP goal – starting from M1 and stretching throughout the project life (Figure 2). A tailored transfer of knowledge e.g., by educational and practical lessons through exchange visits between IPB, FSU and CNR, aims to improve and strengthen the IPB capabilities in management, coordination and administration of R&I research projects based on European standards. Evaluation of successful measures implementation and knowledge and skill transfer is foreseen for the M35 and M36.

Year	1						2						3						
Month	2	4	6	8	10	12	2	4	6	8	10	12	1	2	4	6	8	10	12
WP2 Knowledge and skill transfer / exchange																			
T2.1 European standards and tailored measures																			
T2.2 Management, coordination and administration of projects																			
T2.3 Exchanges of staff with relevant administrative skills																			
T2.4 Training programs for administration staff																			
T2.5 Evaluation of successful knowledge and skill transfer																			
T2.6 Smart- and photo-responsive materials for MOEMS																			
T2.7 Lectures and practical training on photocurable materials																			
T2.8 Lectures and practical training on micro- and nanostructuring																			
T2.9 Upgrading set up for laser writing at IPB																			
T2.10 Lectures on developing quantum biophotonics at IPB																			
T2.11 Lectures on nonlinear interferometers and quantum imaging																			
T2.12 Practical excises on heralded entangled photon pairs																			
T2.13 Tutorial on quantum holographic microscope																			

Figure 2. Exempt from the Gantt chart of the project, focussing on WP2.

As outlined in the Grant Agreement, the beneficiaries will continuously report on the progress of the action (e.g. deliverables, milestones, outputs/outcomes, critical risks, indicators, etc; if any), in accordance with the timing and conditions it sets out (as agreed with the granting authority).

2.2 Purpose and scope of this deliverable

This deliverable offers a short version of the overview of the Implemented measures and processes to improve strengthen IPB capabilities based upon D1.1 and D1.2, elaborated by the partner IPB. IPB has 10-year Transformation Plan, drafted before the start of the BioQantSense project, so this report will also show the adjustments made to the Plan in accordance to the D1.1. and D1.2, particularly in the fields of photonics, project management and project administration. The “IPB Strategy & Action plan” was delivered in April 2023, and the recommendations taken from D1.2 and applied to the IPB in general, were taken into consideration while drafting it.

3. Report on implemented measures and processes

3.1 BioQantSense project support from leading partners

Taken from D1.2: One major goal of the BioQantSense project is to improve the quality of all scientific, managerial, and administrative aspects of the Institute of Physics (IPB) that are pertinent to international R&I endeavours in order to enhance the organization's reputation for excellence. In this context, the ultimate goal of the implemented measures is to promote IPB’s existing Center for photonics distinguished by its high level of scientific achievement and its research lighthouse personality.

In order to achieve this goal, the following recommendations were proposed to IPB in D.1.2:

- a customised institutional strategy for intellectual property rights (IPB)
 - IPB applies a set of legal documents regarding this meter - Rulebook on intellectual property protection, Decision - Intellectual Property Commission, Conscientious assessment – inventions, Distribution of income – inventions, Form on the emergence of innovation (all documents are public and downloadable from the IPB website). These documents were drafted in 2014, and they have been in use since then.
However, in order to meet EU standards and to follow good practice of partners FSU Jena and CNR-INO, updated documents on intellectual property right have been drafted and submitted for the further legal procedure, and expected to be put in force in 2024.
 - IPB has signed Cooperation agreement with the Institute of Comparative Law in the first half of 2023 at the IPB premises. Researchers from the Institute of Comparative Law also referred to fields in which law and physics meet each other, such as the law in artificial intelligence. The agreement covers the consultations and issues regarding the intellectual property rights, Patent Law and other legal aspects of technology transfers.

- The customised institutional strategy for intellectual property rights has not been drafted yet, but this issue is covered by the IPB's transformation plan and strategy.
- strategic networking with two prominent EU partners, FSU Germany and CNR Italy, in order to achieve a knowledge transfer and improved quality of all scientific, managerial, and administrative aspects of the Institute of Physics (IPB)
 - During the first 11 months of the project, 8 scientific & administrative visits were realized according to the Deliverable D4.2 Schedule for project meetings. Deliverable D4.2 Schedule for project meetings predicts 28 exchange visits total in order to enhance IPBs contribution in the field of quantum biophotonics and improve its scientific profile and reputation. These visits expected to be carried out smoothly and with the expected result.

These visits have objectives defined with the goal of Strategic networking of IPB with two EU partners, in order to achieve a knowledge transfer and improved quality of all scientific, managerial, and administrative aspects of IPB. Reports on these visits are discussed between parties involved, drafted for now, and will be delivered as the midterm reports on visits to CNR (D2.2) and to FSU (D2.3). Evaluation of successful measures implementation and knowledge and skill transfer is foreseen for the M35 and M36 within the WP2.
- an organizational plan to have a specialized scientific strategy that is directed toward the new area of quantum biophotonics
 - Since classical metrology is unable to adequately fulfil the growing demand for higher sensitivity, the new area of quantum biophotonics is currently emerging as a method for performing measurements in a wide range of bio-environments that are both highly sensitive and dependable. Biophotonics turns out as an area of science that is both concrete and transdisciplinary, and it has the potential to have high-impact applications in the fields of medicine, pharmacy, agriculture, and environmental protection.
 - The specialized scientific strategy that is directed toward the new area of quantum biophotonics at the IPB's level has not been fully developed, although the preparation of the draft describing the vision and mission of the new centre for quantum biophotonics is planned for the following project year.
 - In the context of the scientific exploratory project, the development of all relevant methods and practices learned from European partners will be included in the draft.
- A particularly strong interaction between the Faculty of Biology at the University of Belgrade, which has been a long-term collaborator of IPB, with the European partner CNR directed toward the new area of quantum biophotonics, is expected in the project.
 - Strong cooperation exists and is further deepened in the areas of selecting, preparing, and cultivating acceptable biosamples. FBUB researches participate in the realized project activities regarding the foreseen knowledge transfer.

3.2 General recommendations to IPB

There were no specific recommendations in D1.2 regarding the IPB facilities and equipment. The partner drafting the D1.2 stated that:

The IPB facilities and equipment are all research-grade and state-of-the-art, in particular those analysed at the Photonics Center as well as the impressive and efficiently utilized and administered High-Performance Computing (HPC) cluster node. Likewise, the existing activities related to technology transfer, metrology and certification are worth a notable mention. The strategy of encouraging and endorsing commercialization in terms of hosting IPB spin-off companies is at the highest international standards of innovation strategies and appears most adapted to the specifics of the regional and national growing economy in Serbia.

It is also acknowledged that IPB has already developed a long-term strategy, the so-called 10-year Transformation Plan. In this ambitious concept, IPB has defined goals and developed concepts for the allocation of resources for a continuous growth which shall, e.g., accumulate in a doubling of the current numbers of scientists.

- In D1.2 the IPB management was strongly encouraged to assemble all forces while continuing on this path and to strive for the goals formulated in this institutional strategy.
 - Reorganization of existing offices, employment of new competent people in various sectors of organization (administrative and scientific), adopting new internal regulations, are implemented measures for this recommendation. IPB is devoted to fulfilling the goals of the “IPB Strategy & Action Plan”, and to reach the position of the leader in international project activities and cooperation, and short-term results are already notable.
 - The most significant internal documents, drafted till M11 of the Project and linked to the activities and visit of the IPB’s administrative staff, are Regulation on project realization and abovementioned IPB Strategy & Action Plan.
- It is also mentioned in D1.2 that governmental decision-makers should support IPB with all adequate means, like e.g., a merit-based financial support flanked by continuous external evaluation.
 - IPB is an Institution under the Ministry of Science, Technological Development and Innovation. The governmental decision-makers support IPB with all adequate means based upon the legal framework of the Republic of Serbia. The financial support is mainly realized by the governmental Science Fund and Innovation Fund. Further support is also available within the 17 programme schemes for institutions under the Ministry’s jurisdiction (annual activity of the Ministry of science). IPB is the leader in winning the governmental calls for science projects among the Serbian institutions.
- One aspect that makes IPB different from other European scientific centers of excellence is its research staff composition, which is composed at a larger part of experienced, senior researchers and to a much smaller part of young-career scientists or PhD students. D1.2 Recommendation – streaming to well-defined balance between junior and senior staff and pushing its recruitment strategy from a currently more nationally oriented perspective to a more international pool of talent.
 - IPB already aims at shifting its staff ratio within the 10-year plan and institutional strategy in order to increase the relative number of PhD students within the institute.

- The number of PhD students increased over the last year (around 15 young researches – PhD students started working at IPB since the project beginning), and the number of young postdocs has increased, as well. The problem that the science in Serbia is facing at this moment is the lack of the graduate and postgraduate physicists, so this is one of the reasons why the fulfilment of the recruitment strategy will need to stretch over the longer time period.
- It is recommended that IPB further seeks for even stronger bonds with the University of Belgrade not only in research, but also in the education and supervision, to allow for a smoother transition of undergraduate and graduate students from and into IPB. This would be a strong strategic element to strengthen the acquisition of excellent talent on the long run.
 - Given that the nature of the research undertaken at the IPB is mostly of multidisciplinary nature, there are many researches – graduates from other-than-physics natural and technical sciences working at IPB (biology, mathematics, electrical and machine engineering, pharmacy). IPB has signed agreement on cooperation with the Faculty of Mechanical Engineering, and one of the agreement's aspects is smoother transition of undergraduate and graduate students from and into IPB.
 - Furthermore, a meeting between the IPBs directors, and FBUB Vice-Dean for science and doctoral studies and the director of the Innovation center founded by FBUB, took place at IPB in the first half of 2023. The meeting was focused on the scientific cooperation deepening (partnership in EU projects, innovation activities etc), cooperation regarding the IPBs Department for international cooperation and projects, and smoother transition of undergraduate and graduate students.
- D1.2 Recommendation - IPB may consider to roll out its recruitment strategy from a currently more nationally oriented perspective to a more international pool of talent.
 - The IPB is a host to ERC project that started in January 2023 (3rd ERC project in Serbia and 2nd at the IPB), and one foreign PhD student is now IPB's employee based on his work on this project. The goal is to engage more foreign PhD students not only on this project, but on some other Horizon and International project that are being realized at the Institute.
 - IPB's international projects' PIs are encouraged, according to the institutional Strategy, to employ more junior researches – PhD students and young postdocs, since the conditions risen from the international projects are more attractive, not only to Serbian, but the foreign researches as well.
 - Scientific visits of the IPB staff to the BioQantSense partner FSU and its internationally oriented Abbe School of Photonics may offer support and advice along these lines. Visits already realized gave an insight to the concept of the international oriented center. However, as stressed out in D2.1, it is very clear that such concepts cannot be easily transferred from one location to another, and definitely regional and national aspects specific to IPB and the Republic of Serbia must be taken into account.

3.3 General recommendations to the Photonics Center (PC)

- D1.2 Recommendation - The Photonics Center (PC) at IPB should be able to identify current breakthroughs in the field of photonics and focus on a few of them in order to perform specialization. International collaborations among research teams must be established through initiatives. Leading researchers need to create necessary infrastructure and an atmosphere of growth for young minds. Younger researchers might return after studying overseas in such an environment. With such a foundation, the PC may strive for excellence in specific areas of research while also enabling the practical application of photonics in collaboration with industry.
 - IPB's researches, not only in the PC, but in the other IPB centers as well, are encouraged to apply to Horizon Europe calls (in the first place) and other international calls. The overview of the open and available (EU) calls and funds has been drafted by the project administration staff, and presented to the IPB management and scientific centers' heads. The results and enhanced international scientific cooperation are expected in the year to come.
 - As mentioned above, the conditions risen from the international projects are more attractive, not only to Serbian, but the foreign researches as well – they contribute to the improved IPB's research infrastructure and the IPB's position as the leader in international research & project activity in Serbia, and should lead to the increased number of the PhD students and young postdocs at the IPB – both -international and of Serbian origin.
 - The multidisciplinary nature of the work in PC requires adequate, diverse scientific background of its members for successful progress in the future. The profile of a valuable researcher is one with a good knowledge in physics and optics, as well as in different disciplines of biology, medicine and electrical engineering. At this time there are not such interdisciplinary programs offered by faculties at Belgrade University, also not as join programs between faculties in natural sciences and engineering. It will be part of the communication and dissemination activities of this project to promote diverse education of students, and to coordinate deans of relevant faculties of Belgrade University in an effort to establish programs that will educate PhD students and deliver experts in need for photonics fields.

3.4 Knowledge transfer between IPB and FSU

Taken from D1.2:

The FSU, and particularly its internal Abbe Center of Photonics, is a world-class research site for optics and photonic quantum technology with unique links to a multitude of academic and industrial partners. The shared infrastructure and complementary competencies combine to establish an extraordinary research facility with approximately more than 800 researchers. In the framework of the BioQantSense project, FSU will contribute to a deepened transfer of knowledge project in the following ways:

- ✓ *Knowledge of the design, simulation, construction, and operation of quantum imaging and spectroscopy systems, as well as relevant subsystems such as tailored quantum light sources. For example, it is in Jena where the currently world's brightest polarization entangled photon pair source for Quantum Key Distribution (QKD) applications is developed.*
 - ✓ *Experience sharing on developing highly compact prototypes for Quantum Imaging with Undetected Photons (QIUP), with many more setups available on a breadboard level, including the ability to miniaturize entangled two-photon absorption and MIR/VIS ghost imaging setup. A strong and proprietary instrument for chemical selective quantum imaging with greatest detection efficiency is provided, particularly for QIUP in combination with holographic schemes.*
 - ✓ *Prior experience integrating quantum enhanced imaging/spectroscopy modalities into existing imaging and microscopy equipment and devices.*
- It is recommended that FSU and IPB collaborate strongly and without any reservation on the exchange of knowledge, people and results to drive these encouraging results into a joint and successful research effort.
 - Three scientific visits of IPB researchers to FSU Jena have been realized in the first 11 month of the Project. During these visits, FSU and IPB shared and exchanged expertise on classical holography techniques that have proven to be extremely effective in fields as diverse as microscopy, manufacturing technology, and basic research. This networking will be continued over the following scientific visits predicted by the project.
 - A three-week-long visit from the Institute of Physics, University of Belgrade (IPB), to the Friedrich-Schiller-University Jena (FSU) was realized in April 2023. IPB's student got to visit the ABBE Center of Photonics and get experience in Quantum Interferometry with Undetected Photons.
 - The manuscript on modified quantum interferometric scheme for quantum imaging with undetected photons is in preparation. This work is the result of the long-term visit to FSU.

3.5 Knowledge transfer between IPB and CNR

CNR-INO's Biosensing group is widely known for inventing multifunctional optical devices for chemical and biological sensing, and 3D printing opto-fluidic lab-on-chips with biomimetic sensing elements. The group has also developed and characterized biologically active and functionalized photonic materials for micro- and nano-fabrication. They created innovative organic-inorganic hybrid composites with magnetic, mechanical, and optical properties for biological sensing or activation. On the other side, CNR's Biomedical Optics group develops spectroscopic and microscopic optical approaches for diagnosing biological tissue. The group is experienced in integrating multiple laser scanning imaging techniques (such as two-photon excited fluorescence microscopy, second-harmonic generation microscopy, time- and spectral resolved fluorescence microscopy, and Raman micro-spectroscopy) and spectroscopic methods in optical fiber sensors (such as Raman fluorescence and diffuse reflectance spectroscopy) for real-time and non-invasive biological sample analysis. Complex Photonic

Systems group offers competence in two- and three-dimensional optics, from ordered (photonic crystals) to disordered systems. Guided wave optics, microresonators, and photonic crystal cavities in different materials have been modelled, constructed, and described.

- The significant benefits for IPB's Photonics center from CNR training and exchange are already noticeable. The IPB researchers paid two scientific visits in order to take on competences to nanostructure custom LOCs integrating multiple materials and optical and mechanical design of micro-components for the integrated platform for quantum holographic characterization of biological systems.
- The document with an overview of the results of scientific activities during the visits to CNR and the mid-term visit to IPB has been written and is on review by members from CNR and IPB. It contains detailed description of activities and results of all visits, and recommendations for coming visits.

Knowledge & skills transfers from CNR-INO Grant Management Office representatives to IPB project administrative staff is extremely useful, having in mind that CNR is one of the most successful Italian institutions regarding EU project realization, and the Institute of Physics Belgrade (IPB) has several ongoing EC funded projects.

- The 1st Management visit at CNR from IPB staff was held both, at the headquarter of National Institute of Optics of CNR (CNR-INO) in Arcetri, Florence and at the secondary headquarter of CNR-INO located in Sesto Fiorentino, Florence, where the European Laboratory for Non-Linear Spectroscopy (LENS) is located. Topics discussed during the visit were about financial administration & auditing preparation for EC funded projects - from understanding the financial aspects of Horizon to successfully dealing with on-the-spot audits. Since the Institute of Physics Belgrade (IPB) has several ongoing EC funded projects, it was extremely useful to discuss these topics with the CNR-INO Grant Management Office representatives, having in mind that CNR is one of the most successful Italian institutions regarding EU project realization. Special focus was given to the BioQantSense project realization - project financial and administrative management, delivering results and deliverables in time and in accordance with the project proposal, successful project management and coordination. The IPB's Department for international cooperation and projects was established at the beginning of 2022 and it is still on its path to become strong administrative and expert support to the scientific research teams of IPB working on the EU and international projects. The BioQantSense, being the Twinning Horizon Project, gives IPB the opportunity to learn from the more experienced and widely recognized partner regarding project realization and EU projects Grant Management.
- The topics for the visit of the CNR-INO project management staff to IPB were drafted within the visit report, as a direct output of the visit, in order to improve capacities of all sectors of the IPB administration – legal, financial, HR, public procurements and project management.

- Learning from CNR experiences, IPB is setting the goal of twining some of the grant management tools and models to the IPBs Department for international cooperation and projects in order to become full support to the IPBs researches, as the BioQantSense project predicts.

3.6 Specific recommendations regarding the ongoing BioQantSense project

D.1.2 Recommendations:

- For IPB to grow its professional ties, it needs to regularly participate in conferences around Europe and elsewhere. Disseminating project progress through presentations can be used as a display for any public outreach efforts and develop new research contacts.
 - Participation and presenting the project results at the international conferences and workshops is predicted within the project activity and throughout the project realization.
 - In the first project year, Photonica 2023 conference was held in Belgrade at the end of August 2023. Photonica 2023 included five days of tutorial, keynote and invited lectures, progress reports, contributed talks and poster presentations with the participation of more than 200 eminent scientists, young researchers, and companies' representatives from the field of photonics. It is conceived as a school for educating young scientists and the conference facilitating the exchange of new ideas and knowledge in cutting-edge research in Europe and beyond. It brings together not only scientists from academic and government research institutions, but also the partners from the high-tech industry.
 - BioQantSense workshop "Quantum Sensing Integration within Microfluidic Lab-on-a-chips for Biomedical Applications" was held at the Serbian Academy of Sciences and Arts - SASA, Belgrade, Serbia, on August 31st, as a joint event of the Photonica2023 Conference. LoCs systems, thanks to advances in fabrication technologies and to the advent of novel materials, can be designed with embedded structures whose micron-sized dimensions enable to easily handle reduced quantity of fluids as well as to perform multiplexing analysis on the same restricted volumes while avoiding cross-contamination. The workshop focused on: 1. Integration, miniaturizations and preparation of LoC, 2. Novel materials for LoC, 3. Interfaces of LoC with optical set-up.
BioQantSense project, its objectives and so-far results are presented in the form of PowerPoint presentations and project brochures, and the workshop was held with the active participation of the project team members from IPB and partners institutions CNR-INO Florence, FSU Jena and FBUB.
 - On Wednesday, May 24, 2023, students of the Faculty of Science and Mathematics of the University of Novi Sad and students of the Faculty of Mathematics of the University of Belgrade visited the Institute of Physics. The students, accompanied by their professors, visited the Photonics Center, where the researchers introduced them to the scientific topics of the BioQantSense project.
 - BioQantSense Partners participated in the 16th Photonics Workshop, organized by the Institute of Physics Belgrade. The 16th Photonics Workshop was held from

- 12 to 15 March 2023 at Kopaonik, Serbia. This was the good opportunity to present the project, its objectives, and expected results.
- IPB project team members paid an expert visit the Institute of Biophysics in Szeged, Hungary in March 2023. The project, its activities and objectives, and the results of the research done so-far by the partners FSU Jena and CNR-INO Florence, and regarding the activities of BioQantSense project were presented to the Hungarian colleagues.
 - Within the scope of the project, it is essential to develop a plan for the timely publication of relevant scientific findings. Completion of deliverables over the next three years is a top priority for the IPB and its partners. Since preliminary investigations on quantum holographic imaging have already taken place, a reliable setup can be planned in 2023 and assembled perceptively in 2024, according to the milestone plan. At least one high-quality journal submission can be aimed at through regular faculty exchanges at the student and senior staff levels.
 - All deliverables predicted from M1 to M11 are completed. This includes: D1.1, D1.2, D1.3, D1.4, D3.1, D3.2, D4.1, D4.2 and D4.3
 - The manuscript on modified quantum interferometric scheme for quantum imaging with undetected photons is in preparation. This work is the result of the longterm visit to FSU.
 - IPB will be in charge to initiate technical discussions on projects including micro fabrication, optical responsive materials synthesis, in early 2023. A yearlong continuous exchange of personnel and idea will considerably boost the chances of making high impact scientific contributions.
 - During the first 11 months of the project duration, BioQantSense partners relised 8 visits planned within WP2 and held 12 online meetings where they had technical discussions on project.
 - Experimental work is prone to delays since all steps must work together to produce a complex experiment. It is critical to pay close attention to the comprehensive list of optical and electrical components required to carry out a certain experiment. It is typical to encounter vendor delays or additional software requirements. As a result, it is strongly advised to devote significant effort to the planning and organizing stages in order to avoid any delays at the delivery stage. Following good management practices (as outlined above) will yield results. Most significantly, an open line of communication between all stakeholders is required to mitigate any risks.
 - An open line of communication between all stakeholders has been successfully established in order to mitigate any risks of project activities delay. The IPB project team has been formed, with specified tasks of each team member regarding the project WP realization, internal communication within IPB and Photonics center, and external communication with project partners CNR-INO Florence, FSU Jena and FBUB.