



Latvian Institute of
Organic Synthesis

ANNUAL REPORT 2022

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Letter from the Director

Year 2022 is remarkable with several breakthroughs in scientific performance, fundraising activities as well as expansion of our resource base.

I am pleased to report 99 LIOS papers in the SCOPUS database. More than sixty percent of them have been published in Q1 journals, including 3 articles published in prestigious Nature Group journals. The Field Weighted Citation Index (FWCI) LIOS publications reached 2.06, the highest value ever. More than a half of the research publications were result of international scientific collaboration. University of Florence, The French National Centre for Scientific Research (CNRS) and Karolinska Institutet are among the most significant academic collaboration partners of our Institute.

Our colleagues Maija Dambrova and Kristaps Jaudzems,

together with our international academic partners, have published invited review articles in the *Pharmacological Reviews* and *Chemical Reviews*, an achievement clearly demonstrating the scientific competence. The Institute continued to contribute to the development of academic education. In 2022, 32 graduate and undergraduate thesis supervised by LIOS researchers were defended, of which 5 PhD thesis, 14 MSc thesis and 13 BSc thesis. Academic collaboration with the three largest research universities of Latvia – University of Latvia, Riga Technical University and Riga Stradins University has resulted in 16, 15 and 13 joint research papers respectively.



A total of 14 research projects were launched in 2022, bringing in more than €7.5 million in the coming years. Looking at the next year's projects, approvals were received for another 5 projects securing in total €2.8 million.

In 2022 LIOS efficiently continued to collaborate with industrial partners from all over the globe. The total amount of collaborative research projects amounted almost 4.5 MEUR. More than a half of the partners are based in EU, almost 20% are US based companies.

By the end of 2022 the new Scientific Council was elected for the next 4 year period. Scientific Council is the highest decision making body of the Institute.

The Institute's revenue from operating activities for the period from 01.01.2022 to 31.12.2022 was EUR 12,89 million (4% growth relative to 2021). On 31 December 2022, the Institute's balance sheet amounted to EUR 28.9 million, only 1.8% of it being long-term loans. At the end of the reporting period,

the Institute has managed to maintain high liquidity ratios (liquidity ratio - 1.92), thereby providing the necessary operational capital for the research projects carried out and planned.

Overall, it should be concluded that 2022 has been highly successful both in terms of financial and scientific performance.



Osvalds Pugovics

Director

Research

LIOS research quality is on the rise. LIOS publications has reached both the highest ever average impact factor (IF) 6.5 and the field weighted citation impact (FWCI) 2.06 while sustaining high number of publications (99) in 2022. Share of papers in Q1 journals has also increased compared to the previous year exceeding 60% in 2022. This is a rewarding result of efforts and investments made in previous years which include internal motivation schemes, student grant support as well as widening the collaboration network with academic partners

The growing trend in a reach quality for coming years is supported with total of 14 research projects launched in 2022.

Among the projects started, LIOS has taken the role of the coordinator of State Research Program's of Latvia project

in the field of biomedicine, medical technologies and pharmacy "BioMedPharm" which is funded by Ministry of Economics (4.7 milj Eur). The project aims at development of National biomedicine research platform addressing public health challenges in respective RIS3 domain. The platform consolidates the resources of major players of biomedicine ecosystem of Latvia: Latvian Institute of Organic Synthesis; Riga Technical University; University of Latvia; Rīga Stradiņš University; Institute of Food Safety, Animal Health and Environment and Latvian Biomedical Research and Study Center to promote development of new products, and technologies as well as enhancement of scholarly output.

THE 2nd DRUG DISCOVERY CONFERENCE



From September 22nd to 24th, LIOS hosted the 2nd Drug Discovery Conference in Riga, which brought together 43 excellent speakers from 14 countries and more than 200 participants.

The conference was opened by the minister of Education and Science of the Republic of Latvia Anita Muižniece.

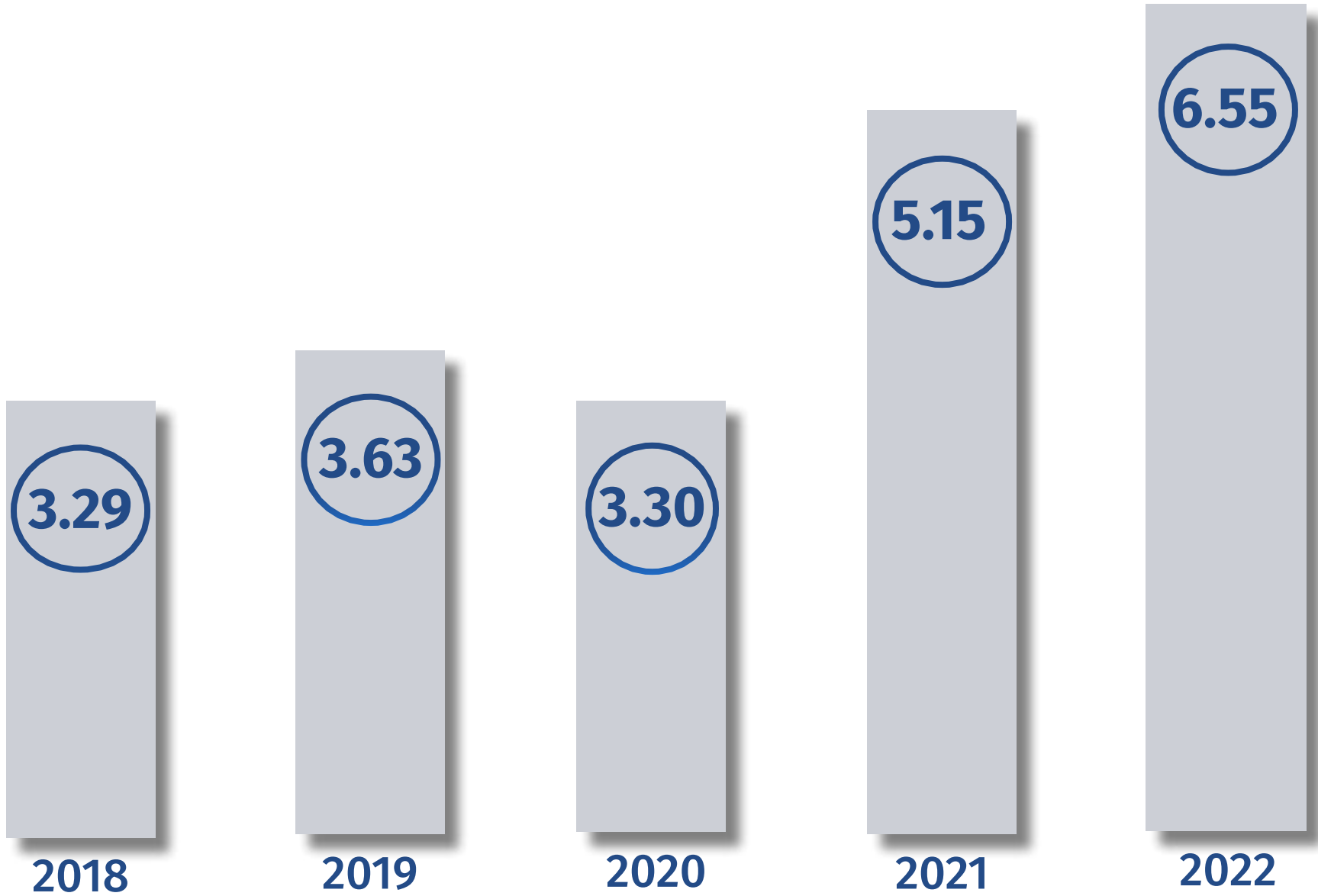
The program of the conference covered modern trends in drug discovery related to organic synthesis, medicinal chemistry, pharmacology, structural biology, and drug delivery. The lectures included achievements in developing anti-infective, anticancer, CNS, and cardiovascular drugs. The plenary lectures were delivered by outstanding researchers – David Crich (Wayne State University, USA), Vladimir Gevorgyan (University of Texas at Dallas, USA), Rolf Müller (Helmholtz Centre for Infection Research, Germany), David Rees (Astex Pharmaceuticals, UK), Chris Schofield (University of Oxford, United Kingdom) and Jieping Zhu (Ecole Polytechnique Fédérale de Lausanne, Switzerland).

A poster session took place after the lectures, on September 23rd. Overall 55 students and researchers took the opportunity to share and discuss their research with conference participants and speakers.

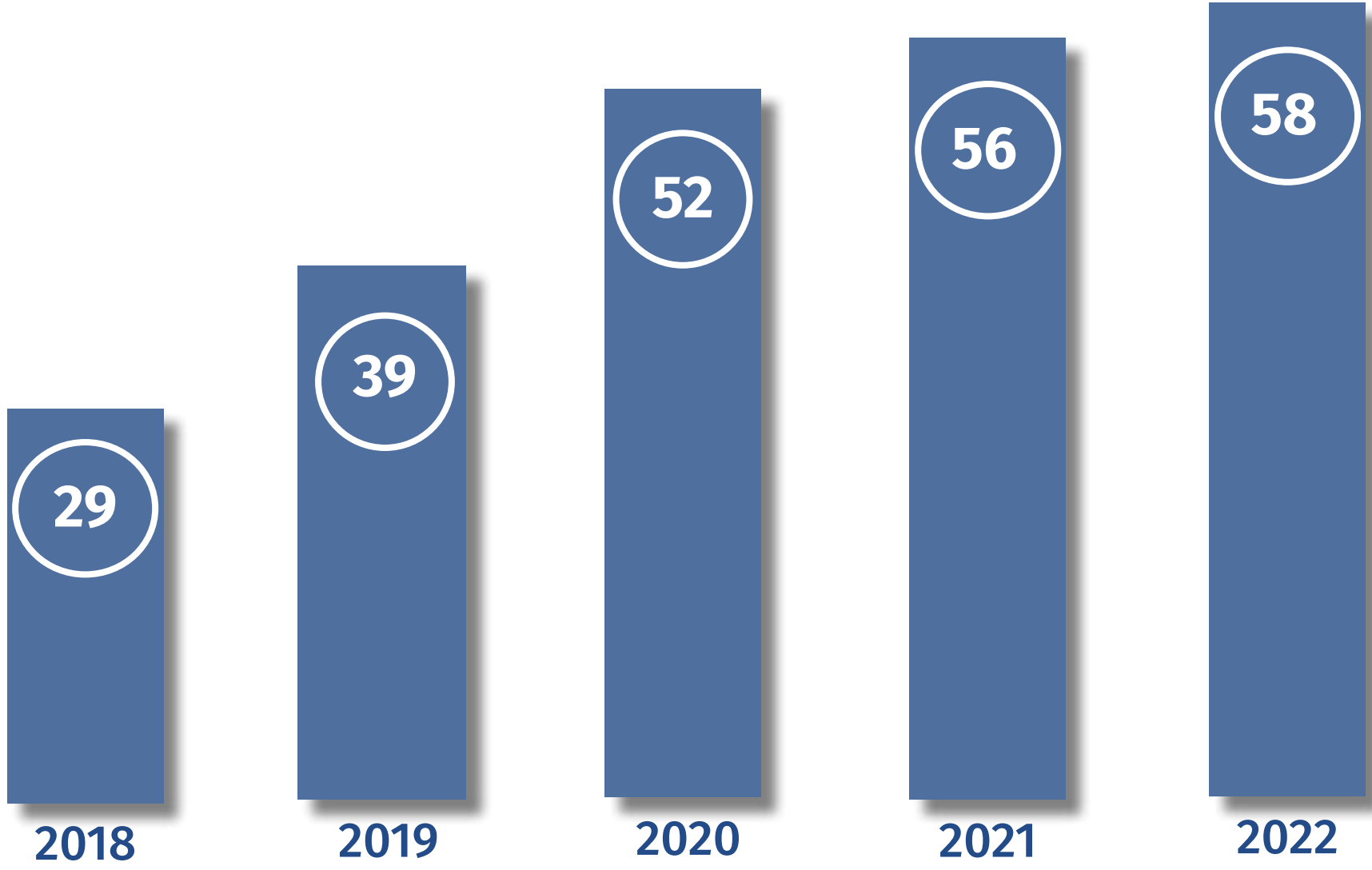
RESEARCH METRICS

The scientific achievements of the Institute are illustrated by 99 publications in journals included in the SCOPUS database. The average impact factor (IF) value of 6.55 landmarks the scientific quality of publications, which represents a 27% increase against 2021. LIOS Field Weighted Citation Index (FWCI) has reached a historic high of 2.06. We proudly see that the number of LIOS research papers in Q1 journals continues to grow steadily and has reached 61% 2022.

AVERAGE IMPACT FACTOR



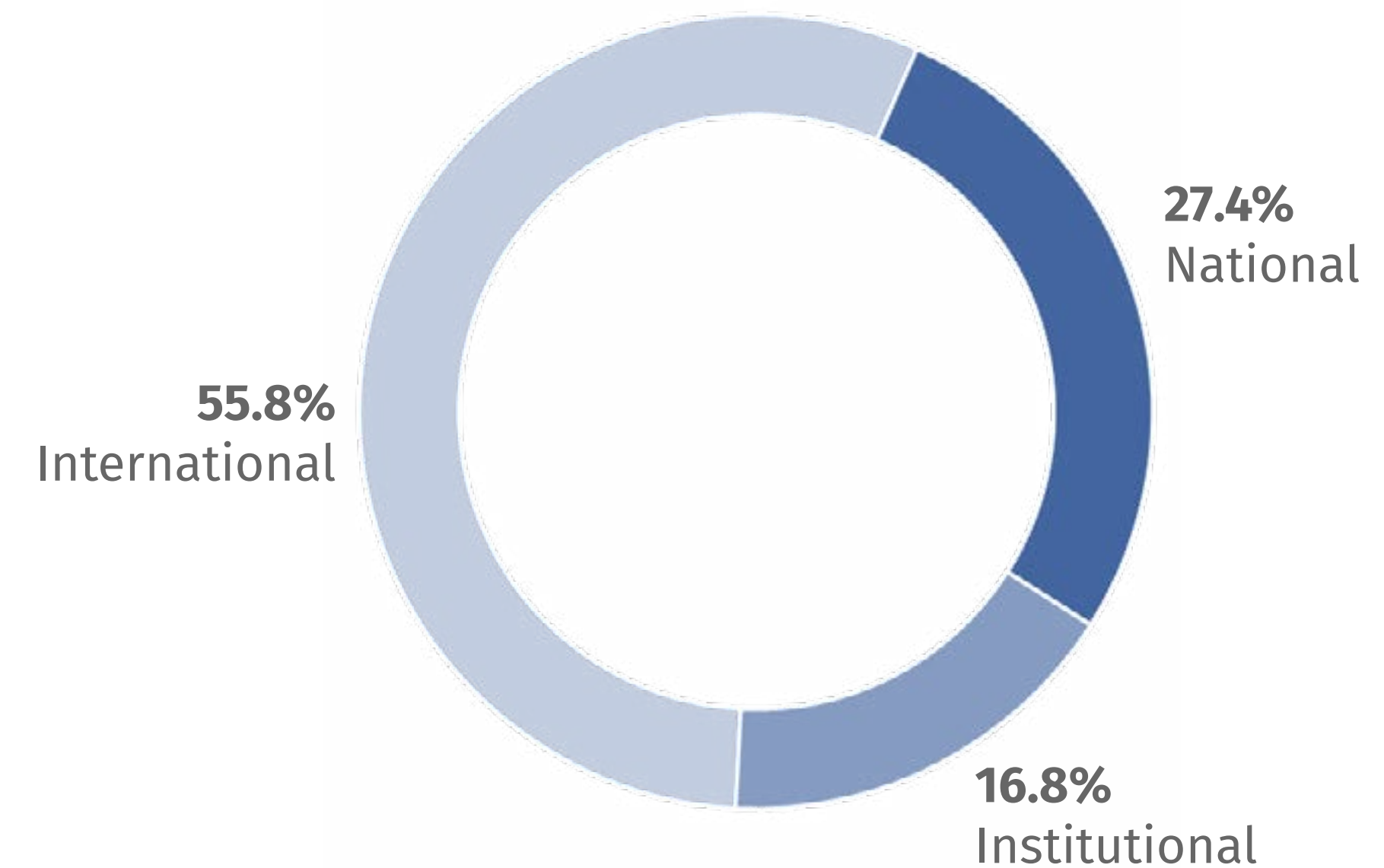
PUBLICATIONS IN TOP QUARTILE (Q1) JOURNALS



Partnerships with Academia

Involvement in international scientific networks and increased international visibility is clearly reflected in SCOPUS metrics - the scientific publications with international collaboration constituted 55.8% in 2022.

COLLABORATION, 2022



COLLABORATION HIGHLIGHTS



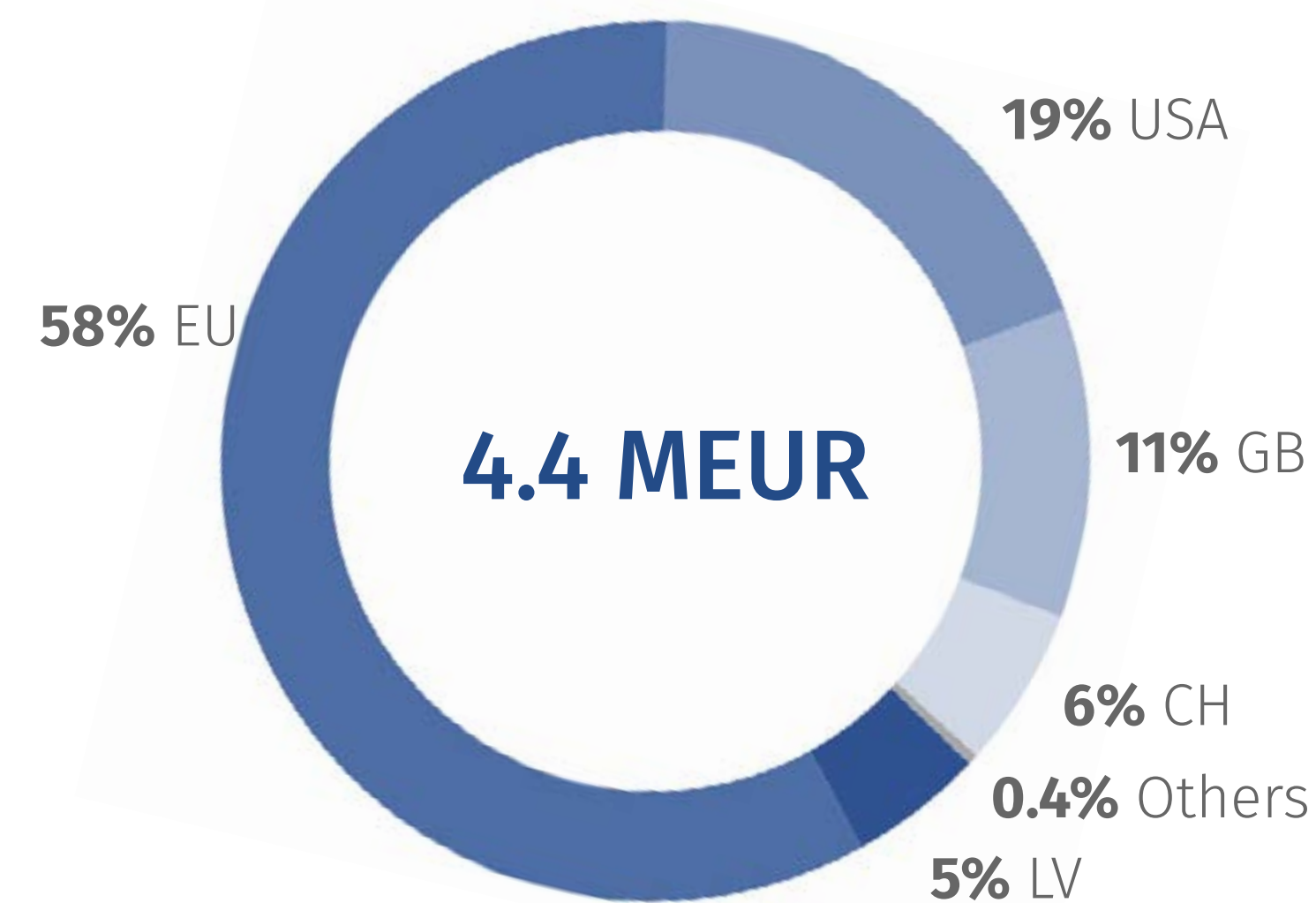
- + Group of prof. K. Jaudzems, together with other 20 research groups contributed the large project devoted to the fragment screening against proteins of SARS Cov 2 proteome. The part of our NMR experts was fragment screening against NSP14/10 complex which have identified several fragment binders as a starting points for discovery of new antiviral drugs (Angew. Chem. Int. Ed., 2022. DOI: [10.1002/anie.202205858](https://doi.org/10.1002/anie.202205858))
- + Dr. R. Vilskersts and Dr. M. Makrecka-Kuka from group of prof. M. Dambrova have collaborated with researchers from National and Kapodistrian University of Athens, Biomedical Research Foundation of the Academy of Athens, University of Amsterdam, Mosaiques Diagnostics GmbH, to investigate of cardioprotective mechanism of sodium glucose co-transporter-2 (SGLT-2) inhibitors (Basic Res. Cardiol. 2022. DOI : [10.1007/s00395-022-00934-7](https://doi.org/10.1007/s00395-022-00934-7))
- + Group of Dr. M. Katkevics has collaborated with group of prof. E. Rozners from Binghamton University to discover a modified peptide nucleic acid which has ability to recognize cytosine in double stranded RNA and as such has a potential application in diagnostics and therapeutics (Chem. Comm. 2022. DOI: [10.1039/d2cc02615e](https://doi.org/10.1039/d2cc02615e))
- + LIOS researchers Dr. D. Ceradini and Dr. K Shubin have collaborated with researchers from University of Antwerp to develop scalable synthesis of UAMC-00050, a Lead Compound for the Treatment of Dry Eye Disease (Org. Process Res. Dev. 2022 DOI: [10.1021/acs.oprd.2c00244](https://doi.org/10.1021/acs.oprd.2c00244))

Partnerships with Industry



Last year, around 25% of funding (MEUR 4.4) have been secured by our collaboration projects with industry partners. EU and USA based pharmaceutical companies clearly dominate our customer portfolio. We are highly committed to developing further ties with the industry to bring our knowledge and results of the research closer to the market and consumers.

PRIVATE FUNDING, 2022



Interaction with policy makers

On October 6, 2022, the Minister of Economics of the Republic of Latvia, Ilze Indriksone, along with her team, visited the Latvian Institute of Organic Synthesis.

This visit provided the Minister valuable insights into LIOS, with a particular focus on the institute's collaboration with the business sector.

Discussions during the visit revolved around the positive impact of various financial instruments such as Competence Center projects, technology transfer grants, and innovation vouchers on fostering cooperation between the academic and commercial realms. A key point of discussion was the newly established Innovation Fund - Sectoral Research Program (IF-NPP), which aims to enhance collaboration among research organizations.



Both the representatives from the Ministry of Economics and LIOS acknowledged the need for greater flexibility in IF-NPP calls for initiating research projects, as well as the option to halt concept verification projects if the initial hypothesis is proven incorrect for objective reasons. The consensus among participants was that involving representatives from the commercial sector in defining IF-NPP goals and generating research ideas is crucial. At the same time, they emphasized the importance of achieving the predefined IF-NPP goals.

The conversations also highlighted the need to develop a national-level strategy for facilitating access to scientific information resources. Acknowledging the access provided to the SCOPUS database by the Ministry of Education and Science, LIOS representatives emphasized the importance of staying attuned to the requirements of both the scientific community and the commercial sector in terms of scientific information accessibility. Based on this, it would be possible to create an appropriate national strategy.

The Minister acknowledged LIOS's contribution to higher education, particularly in the training of master's and doctoral students. Nevertheless, she underlined the urgency of prioritizing science communication, particularly targeting the younger generation within educational institutions.

During the visit, the Minister had the opportunity to explore LIOS's research laboratories and engage in discussions with scientific personnel. Of note was her keen interest in forming collaborations with partners from the commercial sector. She also underscored the need to ensure the availability of research infrastructure to address scientific challenges within the manufacturing industry.





Major Scientific Breakthroughs

Every year, the Latvian Academy of Sciences announces the most distinguished achievements in Latvian science. This year, LIOS received two awards.

NEW APPROACHES TO THE DEVELOPMENT OF PERSONALIZED ANTICANCER DRUGS

The common study of Latvian and Polish scientists deepened the understanding of the mechanism by which malignant tumors form metastases in the human body and evade the attack of the immune system. The obtained results can be used in the development of anticancer drugs for personalized therapy. It has been shown that cancer cells produce a lot of specific enzymes called PDIA1 and PDIA3, which increase the ability of migrating cancer cells to stick to capillary blood vessel walls, as well as to form metastases and cause thrombosis of surrounding blood vessels. As a result, human immune cells are unable to access and destroy metastasizing cancer cells. As part of the research, specific molecules that block the activity of these enzymes have been designed,

synthesized, studied and patented. Experiments have shown that these low-toxic substances reduce the growth of cancer, as well as the formation of blood clots, and are suitable for the development of personalized anti-cancer drugs based on them.

Authors from LIOS: Prof. Ivars Kalviņš, *PhD* Viktors Andrianovs, *PhD* Ilona Domračeva, *PhD* Iveta Kaņepe, *Mg.sc. ing.* Diana Zeļencova-Gopejenko, *Mg.sc.* Irēna Leite

The scientific background of the research is published in *J. Thromb. Haemost.* 2022, DOI: [10.1111/jth.15539](https://doi.org/10.1111/jth.15539); *Cancer Cell Int.* 2022, DOI: [10.1186/s12935-022-02631-w](https://doi.org/10.1186/s12935-022-02631-w); *Cancers* 2020, DOI: [10.3390/cancers12102850](https://doi.org/10.3390/cancers12102850) and Patent applications: WO/2021/141506 (15.07.2021.), WO/2021/141507 (15.07.2021.)



THE DEVELOPMENT OF RESISTANCE-BUSTING ANTIBIOTIC COMBINATION AGAINST MULTI-DRUG-RESISTANT PATHOGENS

Within a highly collaborative European research program, scientists from the LIOS have discovered a new potential treatment that has the ability to reverse antibiotic resistance in bacteria that cause severe conditions such as sepsis, pneumonia, and urinary tract infections. The treatment approach capitalizes on the combination of well-known antibiotics such as carbapenems with adjuvants, specific drug molecules that suppress bacterial resistance to antimicrobials. Carbapenems, such as meropenem, are a group of 'last-resort' antibiotics used to treat serious, multi-drug resistant infections when other antibiotics have failed. Some bacteria have found a way to survive treatment with carbapenems, by producing enzymes called metallo-beta-lactamases (MBLs) that break down the carbapenem antibiotics, stopping them from working. An extensive study, conducted by researchers from the Oxford Institute

for Antimicrobial Research at the University of Oxford, LIOS and a number of European scientific institutions, has led to the development of a new class of adjuvants, called indole carboxylates, that can block MBL resistance enzymes leaving the antibiotic free to attack and kill MBL-producing super bugs. The potential new drugs in combination with meropenem were found to be five times more potent at treating severe bacterial infections than meropenem alone, and at lower dose. Importantly, these potential drugs show only mild side effects in animal models.

Authors from LIOS: *PhD* Edgars Liepiņš, *PhD* Pavels Donets, *PhD* Kirils Šubins, *PhD* Dmitrijs Lubriks, *PhD* Andrejs G. Barans, *PhD* Jānis Kūka, *PhD* Solveiga Grīnberga, *PhD* Marina Martjuga, *Mg.sc.* Mārtiņš Priede, Prof. Edgars Sūna.

The scientific background of the studies is published in Nature Chemistry 2022, 14, 15–24. DOI: [10.1038/s41557-021-00831-x](https://doi.org/10.1038/s41557-021-00831-x)

Awards

We are proud to announce that twenty five LIOS employees were granted various awards and honours.

Prof. Maija Dambrova and Dr. Einārs Loža received individual awards for their outstanding performance in science.



Maija Dambrova, Prof.
Cabinet of Ministers of the
Republic of Latvia Award



Einārs Loža, PhD
Award of
Prof. Gustavs Vanags

Awards



Additionally, several other employees were recognized for their achievements while working in groups.

The 2022 Achievement in Science award from the Latvian Academy of Sciences has been presented to researchers and their study "The development of resistance-busting antibiotic combination against multidrug-resistant pathogens":

Edgars Sūna, *Prof.*

Edgars Liepiņš, *PhD*

Pavels Donets, *PhD*

Kirils Šubins, *PhD*

Dmitrijs Lubriks, *PhD*

Andrejs G. Barans, *PhD*

Jānis Kūka, *PhD*

Solveiga Grīnberga, *PhD*

Marina Martjuga, *PhD*

Mārtiņš Priede, *MSc*

The 2022 Achievement in Science award from the Latvian Academy of Sciences has been presented to researchers and their study "New approaches to the development of personalized anticancer drugs" and its researchers:

Ivars Kalviņš, *Prof.*

Viktors Andrianovs, *PhD*

Ilona Domračeva, *PhD*

Iveta Kaņepe, *PhD*

Diana Zeļencova–Gopejenko, *MSc*

Irēna Leite, *MSc*

Awards



The Diploma of the President of the Latvian Academy of Sciences has been awarded to researchers for their study "A fasting mimicking diet reduces the levels of a biomarker associated with the risk of cardiovascular disease":

Melita Vidējā, *MSc*
Eduards Sevostjanovs, *MSc*
Edgars Liepiņš, *PhD*
Maija Dambrova, *Prof.*
Sabīne Upmale-Engela, *MSc*

The Diploma of the President of the Latvian Academy of Sciences has been awarded to two LIOS researchers for their joint study "Discovered a new solution for low-cost production of white light OLED devices":

Sergejs Beļakovs, *PhD*
Baiba Turovska, *PhD*

The Diploma of the President of the Latvian Academy of Sciences has been awarded to researchers for their study "The role of acylcarnitines in the in energy metabolism":

Maija Dambrova, *Prof.*
Edgars Liepiņš, *PhD*
Reinis Vilšķērsts, *PhD*
Marina Makrecka-Kūka, *PhD*
Jānis Kūka, *PhD*

Education

Although LIOS is not a degree issuing institution, we are strongly committed to supporting academic education in Latvia by providing infrastructure, funding and supervision of graduate and undergraduate students for their thesis. In 2022 thirteen BSc, fourteen MSc and five PhD thesis were defended.

DEFENDED THESIS

13
BSc

14
MSc

5
PhD



To financially support the students attaining their thesis at LIOS, we have launched a LIOS scholarship program. In 2022 we have awarded 9 scholarships and we have allocated EUR 257 thousand in total for that purpose.

Career Development



Raivis Žalubovskis, *Assoc. Prof.*
Corresponding Member of Latvian
Academy of Science

At the senior level, Raivis Žalubovskis has achieved a significant milestone in his academic career. He was elected as a Corresponding Member of the Latvian Academy of Sciences, marking a remarkable accomplishment in recognition of his contributions to the field.



Resources

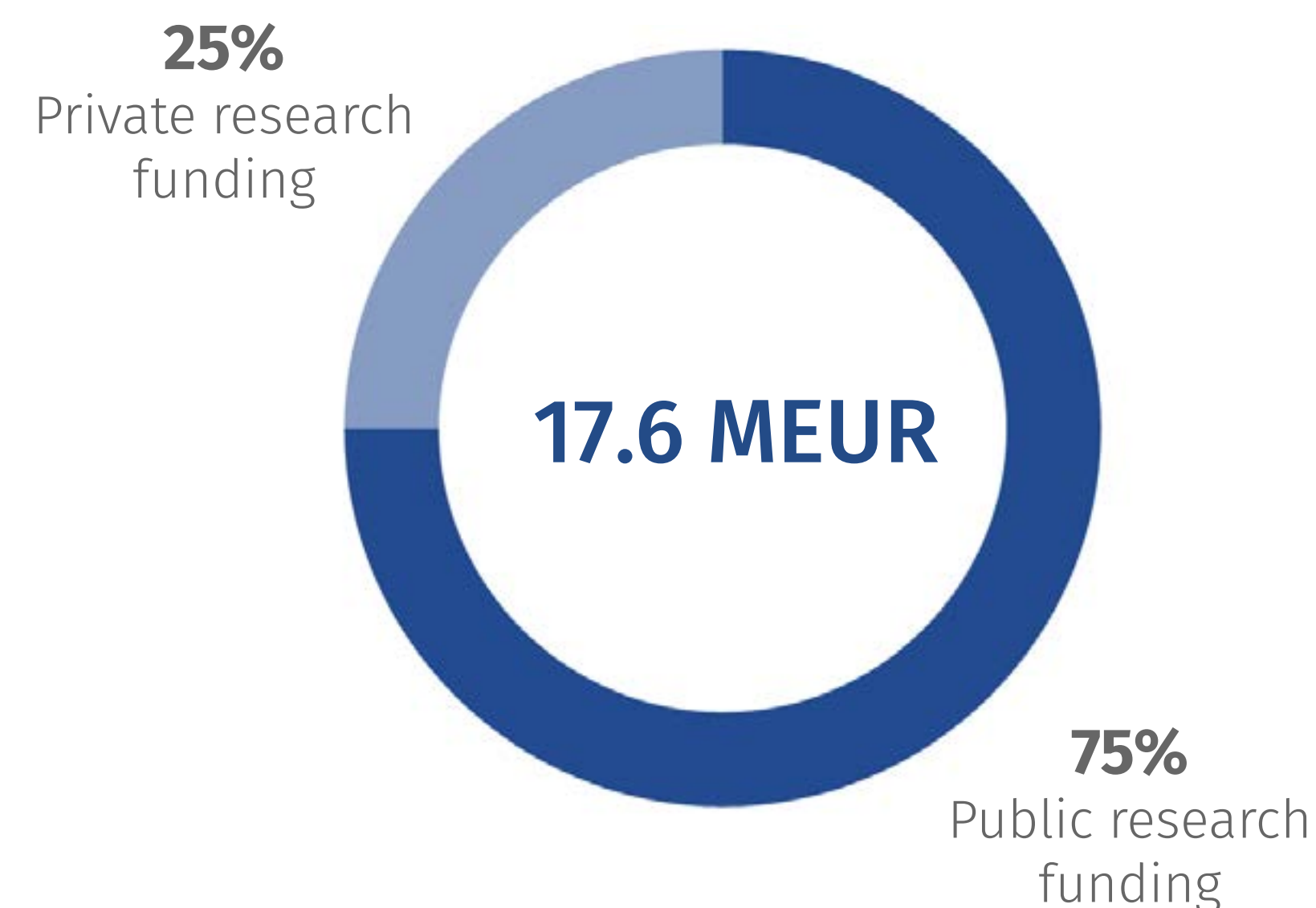
FINANCIAL RESOURCES

The total funding for 2022 reached 17.6 MEUR, where one-fourth of it was supplied by private partners.

At the end of the year 2022, we have achieved a solid financial position for our operations and development.

LIOS has high liquidity (liquidity ratio – 1.92) and low debt burden (long term liabilities as a % of total assets – 1.8%). We closed the books with MEUR 9 in long and short term deferred revenue account (31% of the total book value), suggesting for a considerable volume of projects in the pipeline. Robust MEUR 9.2 were accumulated in cash on the 31st of December 2022.

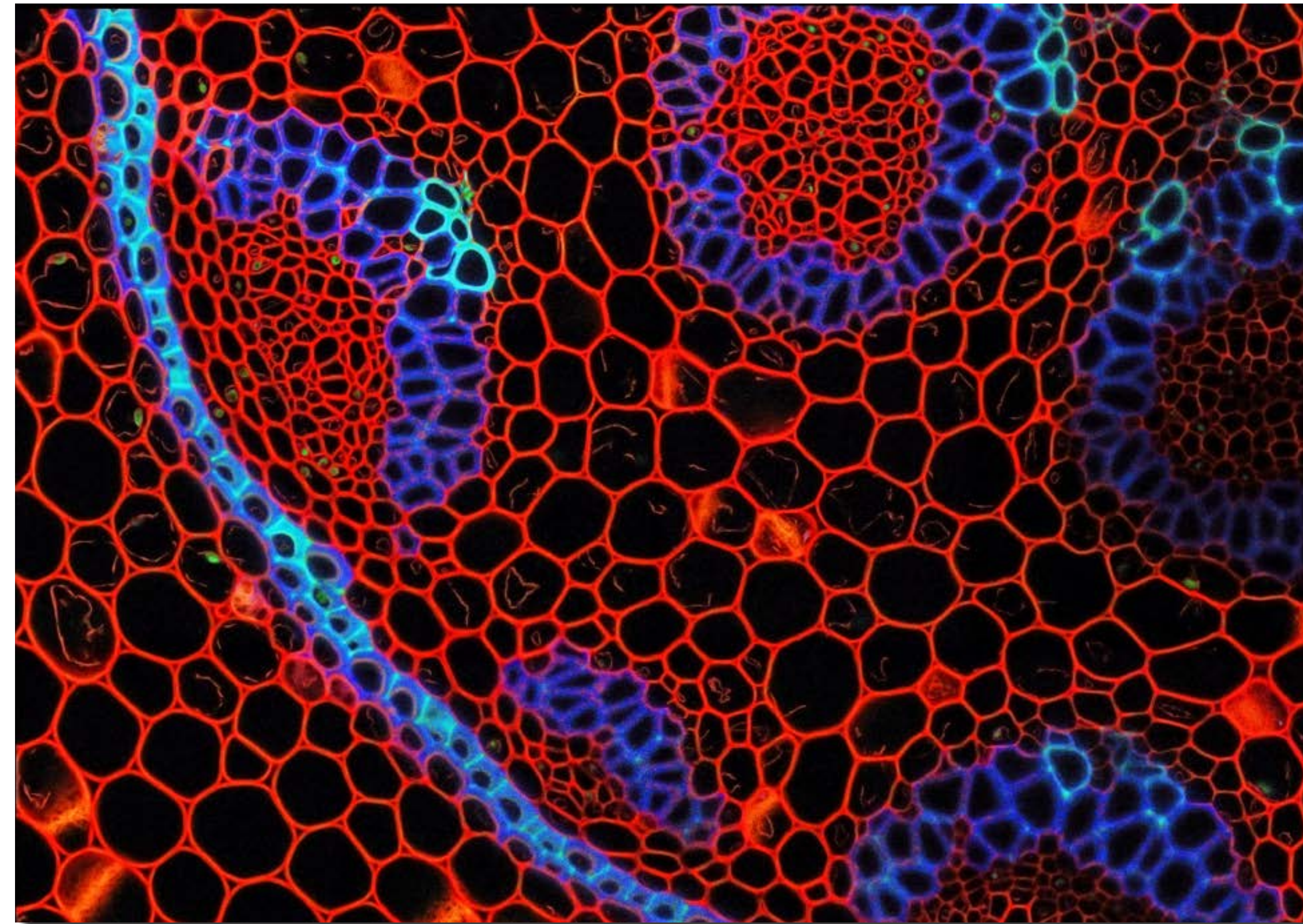
TOTAL FUNDING, 2022



RESEARCH EQUIPMENT

In 2022 we have invested around MEUR 1.6 in research equipment. The largest investment was a new confocal microscope STELLARIS 8 tauSTED. Acquisition of this instrument will enable imaging beyond the diffraction limit. The instrument allows to study multiple dynamic events simultaneously, e.g. to investigate molecular relationships and mechanisms within the cellular context. This is the last generation instrument characterized by extreme robustness and ease of use.

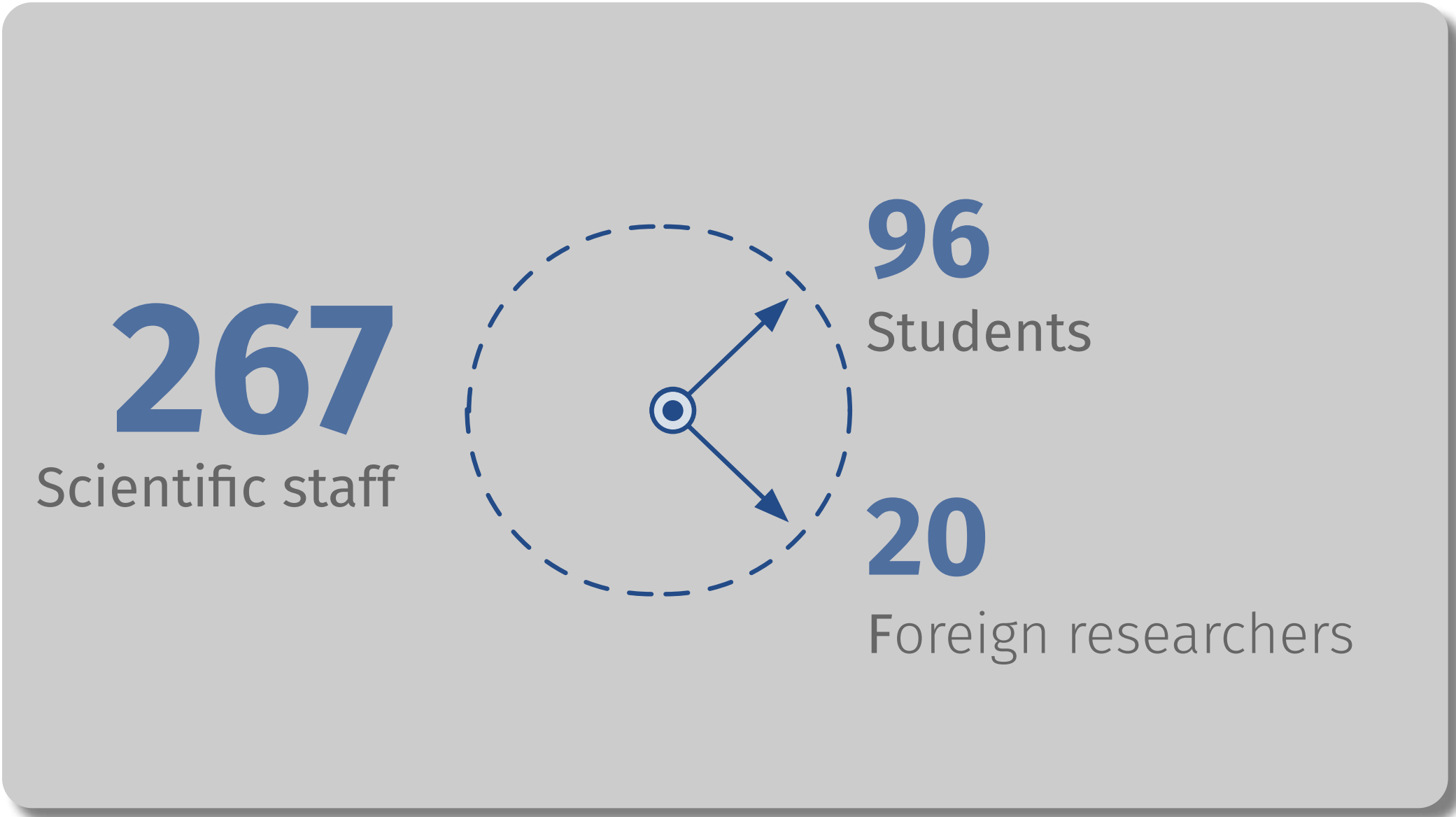
The funding was secured by Horizon 2020 program's project "Baltic Biomaterials Centre of Excellence" (No. 857287).



Convallaria majalis root cross-section. The image was captured with a STELLARIS 8 tauSTED super-resolution fluorescence microscope

PEOPLE

At the end of 2022, we are happy to count around 96 students and around 20 foreign researchers among our scientific staff.



An effective motivation scheme is in place to foster grant application writing, project leading and high quality research publishing in high impact journals (highest bonus reaching up to EUR 21,8 thousand per person). In total EUR 126 thousand were allocated to the employee motivation scheme.

ESTATE

In 2022 we have completed the new Biotechnology building aimed for needs of the Biotechnology group. EUR 2.12 million were invested in the construction of the facilities.

The funding was secured by European Structural and Investment Fund project No. 1.1.1.4/17/I/007.



Governance

SCIENTIFIC BOARD

The functions of the supervisory board at the LIOS are performed by the [Scientific Board](#) (SB).

In 2022 new Members of the SC were elected by the General Assembly of LIOS for the next four years. The scientific council is composed of 15 members and it is the highest decision making body of LIOS.

The SB of LIOS makes decisions on strategic research directions, approves budgets and elects the Management Board of the LIOS.



Edgars Sūna, Prof.
Chairman of the SB



Kristaps Jaudzems, Prof.
Deputy Chairman of the SB



Pāvels Arsenyan, PhD



Maija Dambrova, Prof.



Liene Grigorjeva, PhD



Mārtiņš Katkevičs, PhD



Edgars Liepiņš, PhD



Ilga Mutule, PhD



Vita Ozola, PhD



Kārlis Pajuste, PhD



Aiva Plotniece, PhD



Gints Šmits, PhD



Jānis Veliks, PhD



Līga Zvejniece, PhD



Raivis Žalubovskis, Prof.

MANAGEMENT BOARD

Executive power is granted to the director of LIOS. The Director is elected by the Scientific Board. The duties of the Director are defined by the Law on Scientific Activity. The Director of LIOS and his deputies are the [Management Board](#) (MB) of the Institute.



Dace Karkle
Deputy Director



Osvalds Pugovics, PhD
Director



Aigars Jirgensons, Prof.
Deputy Director

At the beginning of 2019, Osvalds Pugovics was re-elected as Director. This is his second term and it shall expire in 2023.

In spite of efforts taken to bring the best practices of governance into our processes and procedures, we are convinced that we can do more in terms of stakeholder engagement in LIOS governance.

Summary Financial Statements for 2022

Fiscal year	2022
Name	Latvian Institute of Organic Synthesis
Registration number	90002111653
VAT registration number	LV90002111653
Address	Aizkraukles str. 21, Riga LV-1006, Latvia
Phone	+371 67014801
Email	sinta@osi.lv
Website	www.osi.lv/en
Form of ownership	public research organization
Financial year	01.01.2022–31.12.2022
Auditor	KPMG Baltics SIA

Independent Auditors' Report



KPMG Baltics SIA
Roberta Hirsai iela 1
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Latvia

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Independent Auditors' Report

To the Derived Public Person Latvian Institute of Organic Synthesis Report on the Summary Financial Statements

Opinion

The accompanying summary financial statements on pages 28 to 33, which comprise the statement of financial position as at 31 December 2022, the statement of financial performance and cash flow statement for the year then ended, and related note to the summary financial statements, are derived from the audited financial statements of Derived Public Person Latvian Institute of Organic Synthesis for the year ended 31 December 2022.

In our opinion, the summary financial statements derived from the audited financial statements of Derived Public Person Latvian Institute of Organic Synthesis for the year ended 31 December 2022 are consistent, in all material respects, with the audited financial statements on the basis described in the Note to the summary financial statements.

Summary Financial Statements

The summary financial statements do not contain all the disclosures required by the Cabinet of Ministers Regulation of 19 June 2018 No. 344 'Procedures for preparing annual financial statements' of the Republic of Latvia. Reading the summary financial statements, therefore, is not a substitute for reading the audited financial statements of Derived Public Person Latvian Institute of Organic Synthesis and our report thereon.

The Audited Financial Statements and our Report Thereon

We expressed an unmodified audit opinion on Derived Public Person Latvian Institute of Organic Synthesis financial statements in our report dated 14 March 2023.

Management's Responsibility for the Summary Financial Statements

Management is responsible for the preparation of the summary financial statements based on audited financial statements on the basis described in the Note to the summary financial statements.

Auditors' Responsibility

Our responsibility is to express an opinion on the summary financial statements whether based on our procedures, which were conducted in accordance with International Standard of Supreme Audit Institutions No. 1810 "Engagements to Report on Summary Financial Statements" summary financial statements are consistent, in all material respects, with the audited financial statements.

KPMG Baltics SIA
License No 55

Irēna Sarma
Member of the Board
Latvian Certified Auditor
Certificate No. 151
Riga, Latvia
14 March 2023

KPMG Baltics SIA, a Latvian limited liability company and a member firm of the KPMG global organization of independent member firms affiliated with KPMG International Limited, a private English company limited by guarantee.

Financial statements

STATEMENT OF FINANCIAL POSITION (in euros as at 31st December)

ASSETS

	2022	2021
Non-current assets	17 771 305	15 220 068
Intangible assets	58 309	16 041
Licenses, patents, trademarks	58 309	16 041
Prepayments for licenses, patents, trademarks	-	-
Property, plant and equipment	16 161 891	15 204 027
Land and buildings	6 580 852	6 543 197
Technological equipment	6 979 578	7 272 976
Other equipment	169 567	157 821
Establishment of PPE and assets under construction	2 301 905	759 379
Prepayments for assets	129 989	470 654
Long term receivables	1 551 105	-
Current assets	11 090 220	10 173 026
Inventory	46 229	36 246
Short term receivables	1 498 284	2 342 120
Prepaid expenses and advance payments for services and projects	345 522	347 084
Cash and cash equivalents	9 200 185	7 447 576
TOTAL ASSETS	28 861 525	25 393 094

EQUITY AND LIABILITIES

	2022	2021
Equity	18 458 446	18 638 233
Surpluses/Deficits	18 458 446	18 638 233
Accumulated surpluses	18 638 233	18 808 327
Surplus/Deficit of the financial period	(179 787)	(170 094)
Liabilities	10 403 079	6 754 861
Long term liabilities	4 628 552	4 498 363
Long term loans	505 255	604 291
Long term deferred income and received prepayments	4 123 297	3 894 072
Short term part of long term liabilities	104 247	101 815
Accounts payable	110 060	126 257
Current accrued liabilities	570 007	440 885
Current liabilities for taxes and dues	-	31 788
Other current liabilities	82 001	51 662
Deferred income, received prepayments and transfers	4 908 212	1 504 09102
TOTAL EQUITY AND LIABILITIES	28 861 525	25 393 094

STATEMENT OF FINANCIAL PERFORMANCE

(euro)

	2022	2021
Revenue	12 888 751	12 384 380
Contract research revenue	4 340 644	4 310 345
International grants revenue	646 751	831 640
Transfers	7 825 950	7 096 088
Other revenue	75 406	146 307
Expenses	(13 046 711)	(12 545 638)
Staff cost	(7 568 815)	(7 699 454)
Travel costs	(270 753)	(50 680)
Services	(1 883 757)	(1 541 763)
Goods and materials used	(1 310 011)	(1 394 907)
Taxes	(12 986)	(15 069)
Interest expenses	(10 522)	(7 830)
Depreciation and amortization	(1 984 495)	(1 832 952)
Other costs	(5 372)	(2 983)
Deficit or Surplus before other gains	(157 960)	(161 258)
Gain or loss on financial instruments	(16 937)	(8 836)
Gain or loss on long term non-financial assets	(4 890)	
Total Deficit or Surplus	(179 787)	(170 094)

CASH FLOW STATEMENT

(euro)

	2022	2021
Total cash income	17 579 018	11 978 918
Total cash outflow	(15 826 409)	(13 293 003)
Net cash from operating activities	4 747 883	1 298 507
<i>Cash income from operating activities</i>	17 579 018	11 978 918
Contract research income	4 516 355	4 290 042
International grants income	3 113 777	434 513
Transfers	9 948 886	7 254 363
<i>Cash outflow from operating activities</i>	(12 831 135)	(10 680 411)
Staff cost	(7 627 018)	(7 601 733)
Travel costs	(288 468)	(54 545)
Services	(1 926 507)	(1 469 344)
Goods and materials used	(1 385 773)	(1 424 654)
Taxes	(7 532)	(31 898)
Subsidies, grants and social benefits, current payments to European Union budget and international cooperation	(23 366)	(25 930)
Transfers for operating activities	(1 572 471)	(72 307)

Net cash from investing activities	(2 888 222)	(2 505 552)
<i>Cash income from investing activities</i>	-	-
<i>Cash outflow from investing activities</i>	(2 888 222)	(2 505 552)
Acquisition of and prepayments for intangible assets	(50 553)	(9 330)
Acquisition of and prepayments for property, plant and equipment	(1 465 338)	(1 624 460)
Establishment of PPE and assets under construction	(1 372 331)	(871 762)
Net cash from financing activities	(107 052)	(107 040)
<i>Cash outflow from financing activities</i>	(107 052)	(107 040)
Loans and issued debt securities	(99 036)	(99 036)
Interest expenses	(8 016)	(8 004)
Net cash flow before exchange rate effect	1 752 609	(1 314 085)
Net cash flow	1 752 609	(1 314 085)
Cash and cash equivalents at beginning of period	7 447 576	8 761 661
Cash and cash equivalents at end of the period	9 200 185	7 447 576

NOTE TO THE SUMMARY FINANCIAL STATEMENTS

The summary financial statements comprise the statement of financial position as at 31 December 2022, the statement of financial performance and cash flow statement for the year then ended derived from the audited financial statements of Derived Public Person Latvian Institute of Organic Synthesis in accordance with the Cabinet of Ministers Regulation of 19 June 2018 No. 344 'Procedures for preparing annual financial statements' of the Republic of Latvia.

The full audited financial statements and the Auditors' Report thereon is available at Derived Public Person Latvian Institute of Organic Synthesis, Aizkraukles street 21, Riga, Latvia.

Management believes that the content of the summary financial statements is consistent with the objective of the summary financial statements