



Latvian Institute of
Organic Synthesis

ANNUAL REPORT 2021

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Letter from the Director

The year 2021 has proven that the Latvian Institute of Organic Synthesis (LIOS) is able to sustain the hard times caused by the lingering COVID-19 pandemic. Despite of the restrictions and overall fatigue several significant breakthroughs were achieved in scientific performance as well as expansion of our resource base.

According to SCOPUS, LIOS researchers have published 95 scientific papers in 2021. Remarkable scientific quality is shown by the average impact factor of 5.15 and the fact that 61.5% of our publications are in Q1 journal quartile by CiteScore. For the first time the Field Weighted Citation Index (FWCI) of LIOS reached the value 1.1. Renowned titles like Nature Chemistry and Angewandte Chemie International Edition are in the list of our scholarly output in 2021.

The French National Centre for Scientific Research (CNRS), Karolinska Institutet and the University of Florence are among the most important collaboration partners of the LIOS. In total international academic collaboration accounted for about a half of LIOS research output in 2021.

LIOS continues to search for the attraction possibilities of public funding. In 2021 we have received results for 20 project applications that have been evaluated above the qualification threshold. The total amount of projects launched in 2021 is MEUR 2.5.

The Institute continued to contribute to the development of



academic education. In 2021, LIOS has supervised 19 graduate and undergraduate thesis, of which 3 PhD thesis, 7 MSc thesis and 9 BSc thesis.

The collaboration with industry remained very stable in 2021 accounting for 36% of the total research funding (4.3 MEUR).

LIOS financial performance reflects the academic and research excellence of the institute. The revenues from operative activities have reached MEUR 12.4, however net loss of KEUR 170 was booked mainly due to accounting specifics of infrastructure projects funded by European Structural and Investment Fund. On 31st of December 2021, the total book value of LIOS financial position was fixed at MEUR 25.39, whereas long term liabilities were constituting a mere 2.4% of it. Within the reporting period, LIOS has managed to sustain a high liquidity ratio of 4.5 enabling LIOS to fuel ongoing research projects with necessary working capital.

In 2021, the Cabinet of Ministers has allocated an additional

land of 0.3561 ha to LIOS, thus providing additional resources for our territorial development plans in the coming years.

Finally, at the end of 2021, a major work on the strategy of the Latvian Institute for Organic Synthesis for 2022-2027 was completed. This document will serve as a roadmap for LIOS towards excellence for the next five-year period.

It should be concluded that although national and international measures to limit COVID-19 in 2021 have had an undeniable impact on the Institute's activities, LIOS has been very successful in adapting to the new circumstances. LIOS continues to develop and has exciting plans for new advancements in 2022 and following years.



Osvalds Pugovics

Director

LIOS Strategy for 2022 - 2027

Cure through knowledge

At the very end of 2021 we have adopted a new strategy of LIOS for the next 5 years (available at www.osi.lv). The development of the new strategy started with definition of the mission and vision of the Institute.

To generate commitment to our strategy, we have engaged in the development of the document diverse working groups, involving representatives from all hierarchical, organizational and academic levels of LIOS. Several external both domestic and international experts both from academia and industry shared their views on the role of the LIOS in the ecosystem of life sciences.

This document will serve as a road map for LIOS towards

excellence for the next five-year period.

LIOS commits itself to the development of global knowledge society. The **mission** of LIOS is to lead disciplinary developments and scientific growth. Doing this the Institute will become one of European leaders in chemical and biomedical sciences. LIOS is an institution where personalities, ideas and innovations are born and developed. The activities of the Institute will address global challenges of human well-being and health.

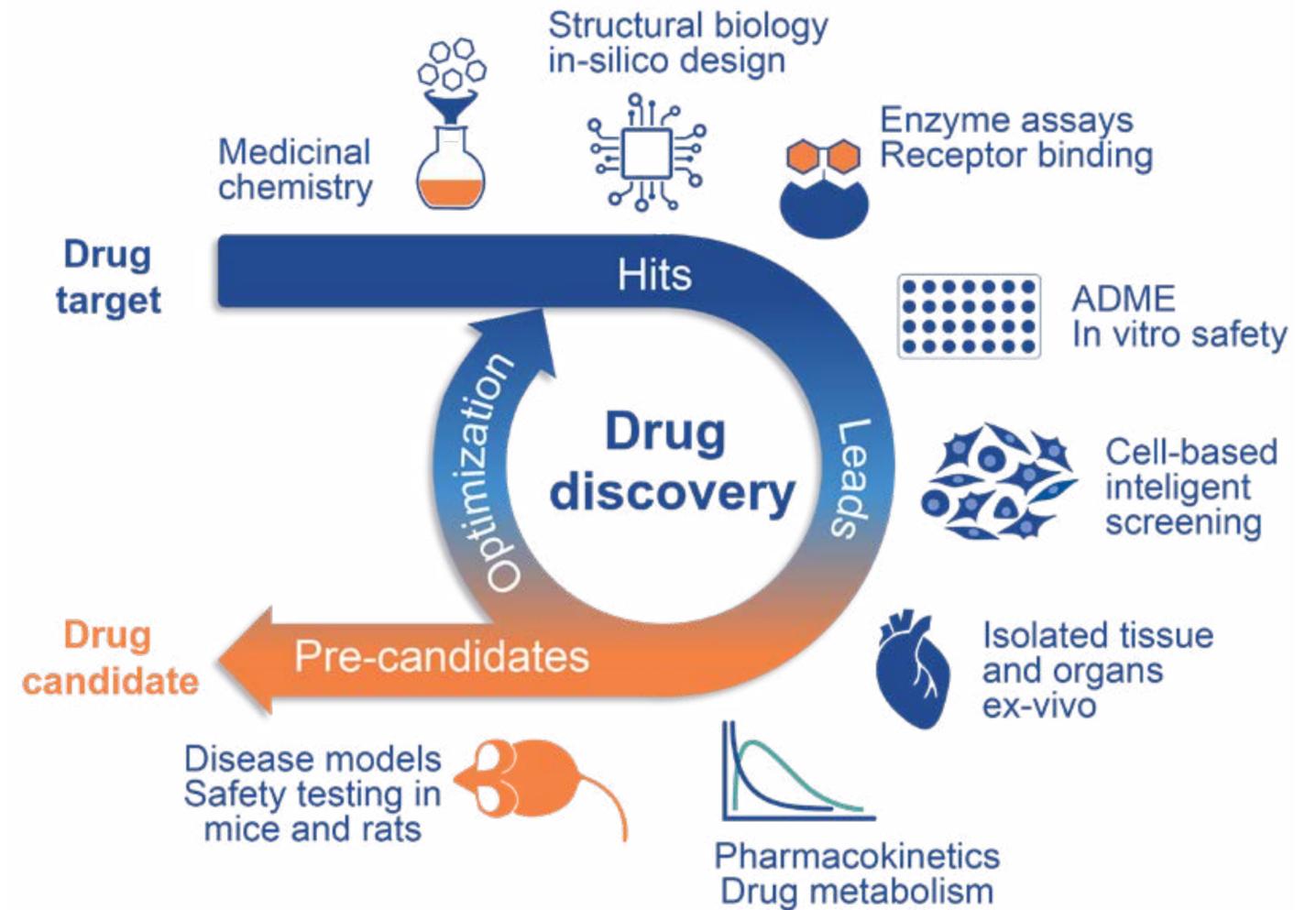
There are five main values of the Institute which are respected during any kind of activities of LIOS:

- + Scientific excellence
- + Commitment to become the most desired employer
- + Serving as a cooperation nexus for the whole life science community
- + Internationally valued performance
- + Respect to the historical continuity of the institution.

Research

LIOS Scientific Board has set a strategic research program for 2022-2027. The research at the LIOS aims to contribute to the improvement of human health and the quality of life, including sustainability as an important condition for human well-being in a longer perspective. To achieve this goal LIOS focuses its research is on two major strategic research areas: “Human Health” and “Sustainable Chemistry and Technologies”.

LIOS has established a comprehensive drug discovery platform consisting of three basic modules - discovery of drug candidates, preclinical development and manufacturing technologies. This allows us to implement the whole cycle of reclinical drug design and discovery.



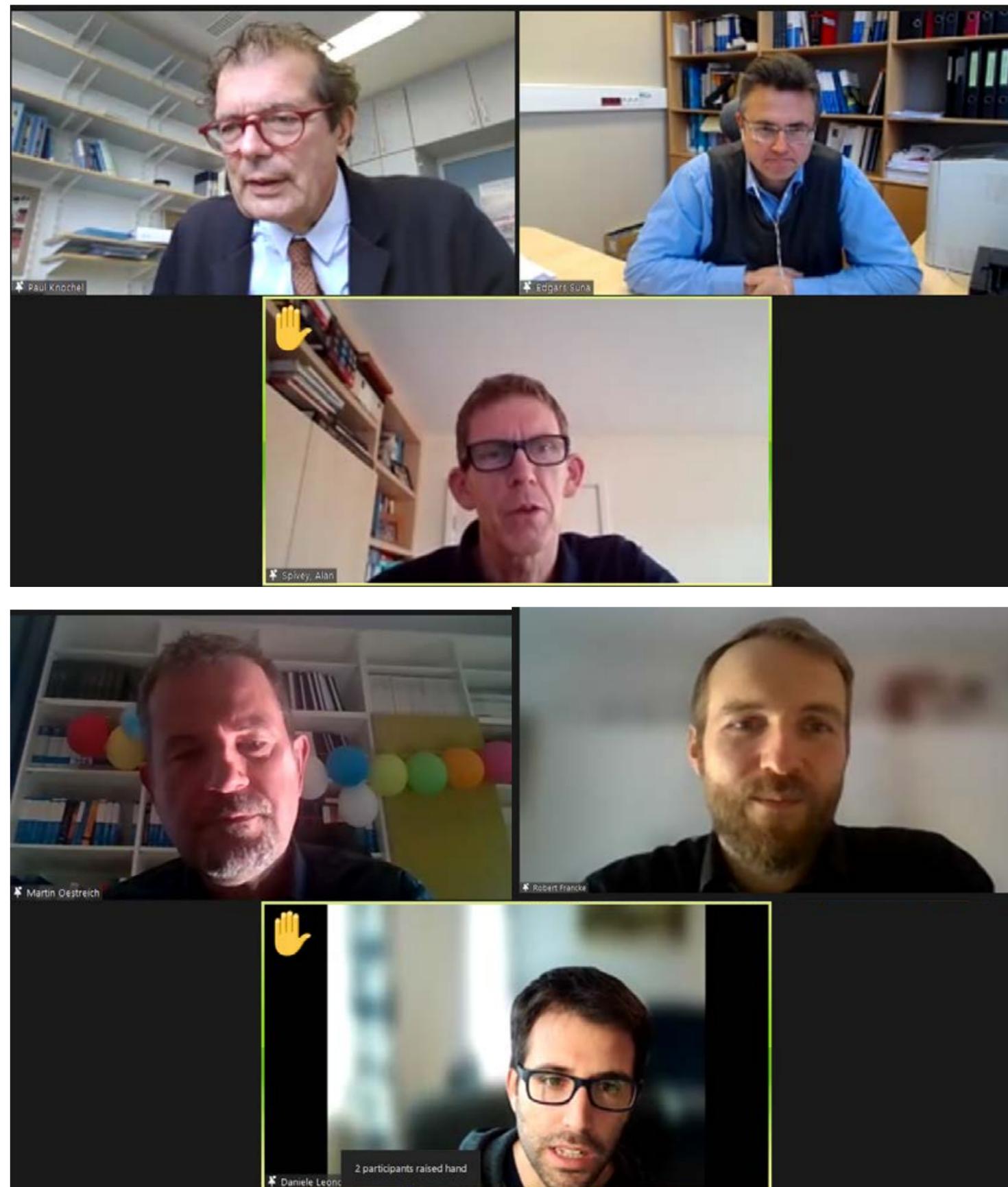
12th PAUL WALDEN SYMPOSIUM

Consistently following the tradition of organization of scientific events, LIOS organized bi-annual Paul Walden Symposium on Organic Chemistry.

Seven distinguished speakers - **Robert Francke**, **Veronique Gouverneur**, **Paul Knochel**, **Daniele Leonori**, **Martin Oestreich**, **Troels Skrydstrup**, and **Alan Spivey** gave lectures on their outstanding research in the field of organic chemistry.

The Paul Walden Symposium has become a tradition which brings together scientists and students from the universities and research institutes of the Baltic States.

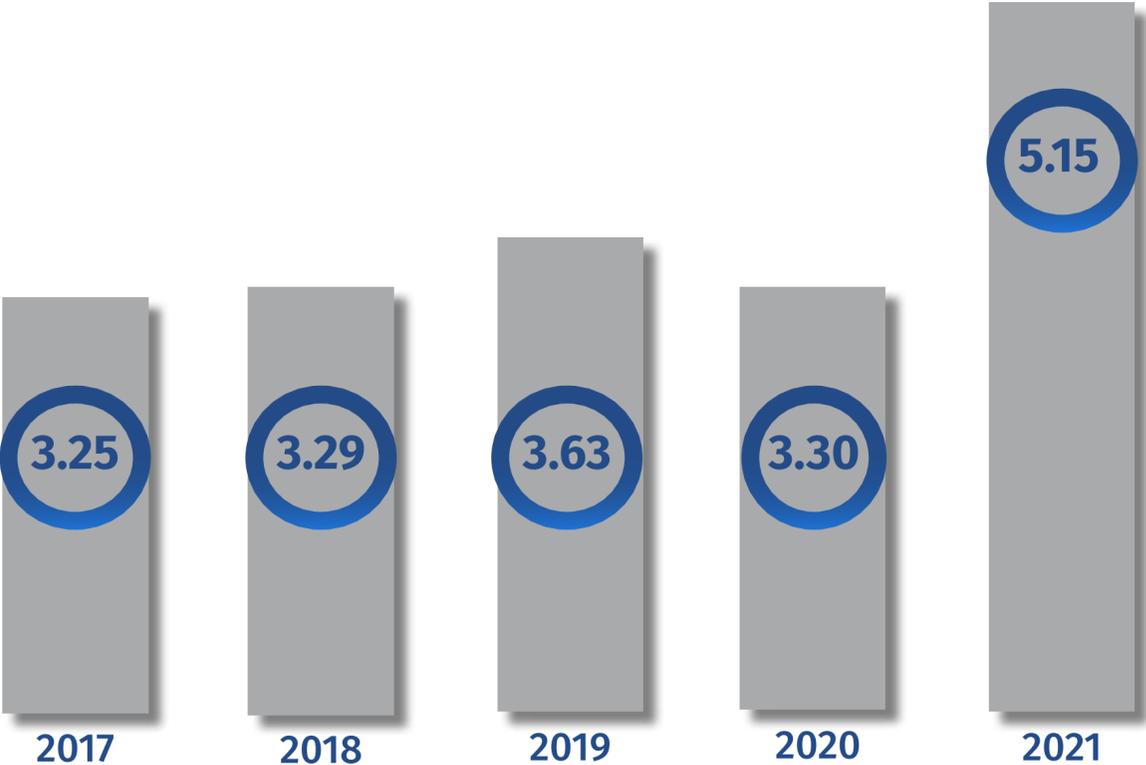
Despite the COVID-related restrictions, all the established traditions of the Walden Symposium were maintained this year.



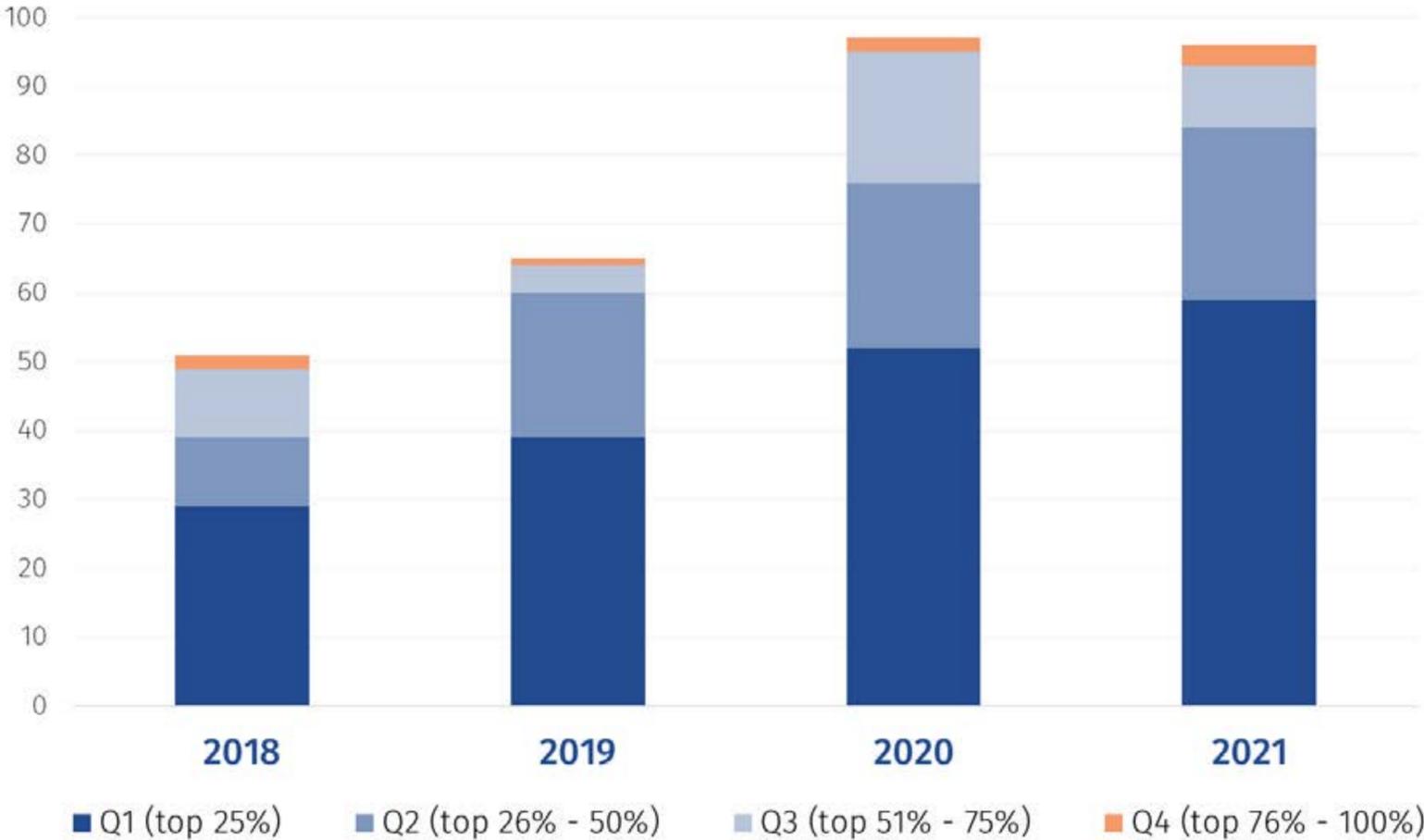
RESEARCH METRICS

The year 2021 has been remarkable in terms of achieved quantitative indicators of scientific excellence. In 2021 we reached an all time highest (5.15) average impact factor of the journals in which we have published our research results. The metric widely used in international scientific evaluation methodologies the Field Weighted Citation Index (FWCI) of LIOS exceeds 1 for the first time since 1998. We proudly see that the share of LIOS research papers in Q1 journals continues to grow steadily and has reached 61.5% in 2021.

AVERAGE IMPACT FACTOR



PUBLICATIONS BY CITESCORE QUARTILE



Self-assessment

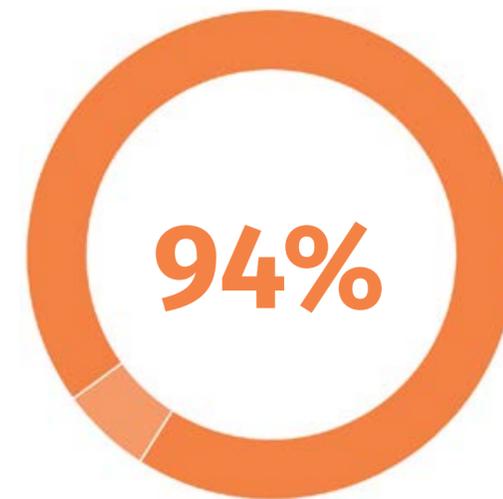
In the summer of 2021 within Alliance4Life consortium activities we conducted an anonymous online survey of the perception of institutional environment and research culture. We are pleased to announce that a bit more than 95% of LIOS academic employees are proud to be part of the scientific community and 94% of respondents would recommend LIOS as a workplace for other scientists. About the same share of LIOS personnel considers high research standards and the integrity of the results as a cornerstone of LIOS science.

More than 80% of respondents believe that they can work independently, just as many colleagues believe that their leaders allow employees to interpret the results independently, showing good development potential.

It is a good indicator and such a result undoubtedly creates confidence in our ability to be brilliant in science.



Employees feel proud to be part of the scientific community

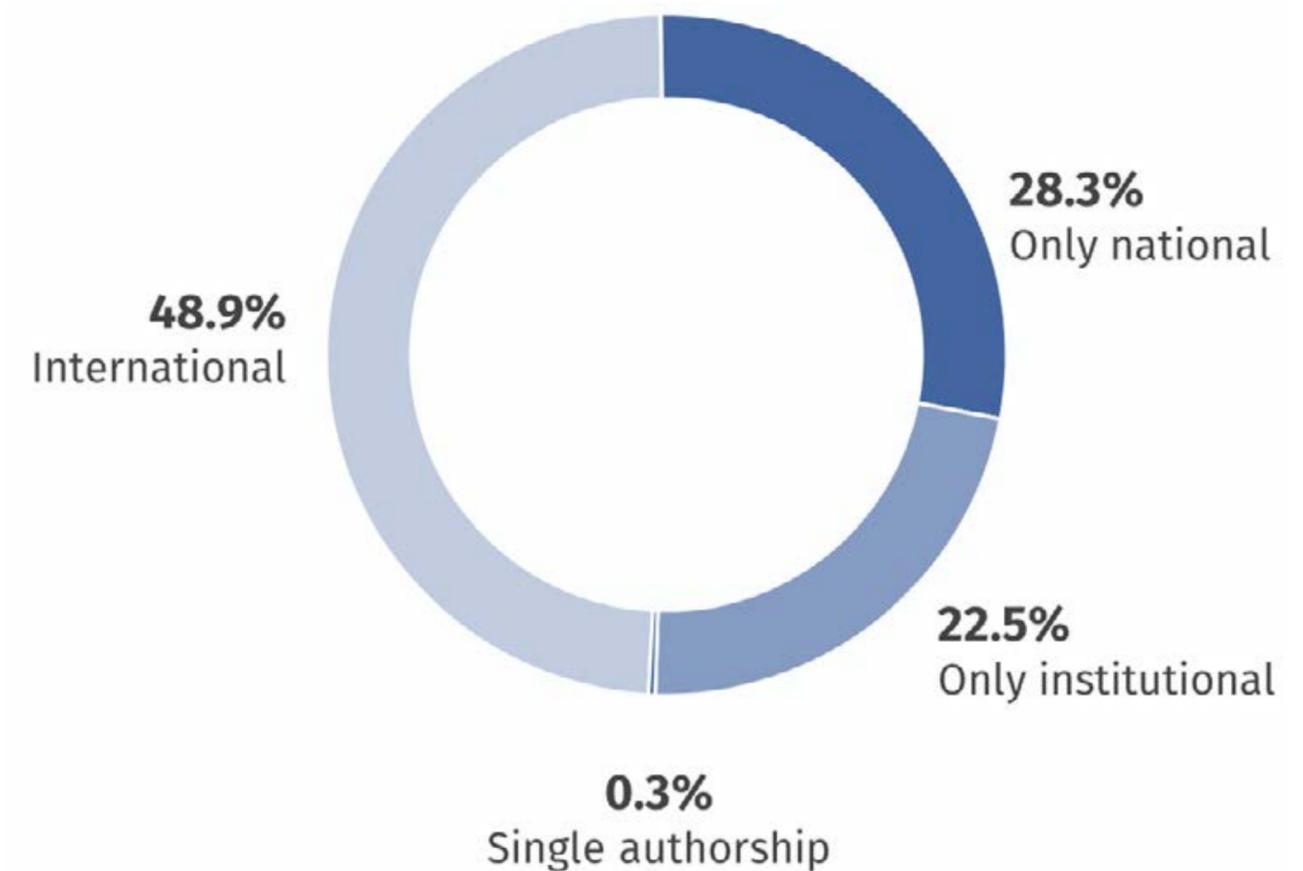


Employees would recommend LIOS as a workplace for other scientists

Partnerships with Academia

Involvement in international scientific networks and increased international visibility is clearly reflected in SCOPUS metrics - the scientific publications with international collaboration constitutes 48.9% in the last 5 years. It has brought a positive impact on the scientific quality as the the FWCI values of these papers are significantly above the average level of LIOS research output.

COLLABORATION 2018 - 2021



COLLABORATION HIGHLIGHTS

- + LIOS researchers Dr. E. Liepins, Dr. P. Donets, Dr. K. Shubin, Dr. D. Lubriks, Dr. A. Baran, Dr. J. Kuka, Dr. S. Grinberga, Dr. M. Martjuga, M.Sc. M. Priede, and Prof. E. Suna have collaborated with researchers from University of Oxford to develop new class of broad-spectrum metallo- β -lactamase inhibitors as potential antibiotic adjuvants (*Nat. Chem.* 2021. DOI: 10.1038/s41557-021-00831-x).
- + Prof. A. Jirgensons and PhD student E. Lidumniece have collaborated with malaria biologists from Crick Institute to discover peptidic boronic acids as a potent cell-permeable inhibitors of the malaria parasite egress serine protease SUB1. (*Proc. Natl. Acad. Sci. U.S.A.* 2021, 118, e2022696118. DOI: 10.1073/pnas.2022696118).
- + Group of Prof. M. Dambrova together with researchers from University of Amsterdam and Lithuanian University of Health Sciences have explored energy substrate metabolism and mitochondrial oxidative stress in cardiac ischemia/reperfusion injury (*Free Radic. Biol. Med.* 2021, 165(24), 37. DOI: 10.1016/j.freeradbiomed.2021.01.036).
- + The team led by Dr. P. Arsenyan have collaborated with researchers from Kaunas University of Technology to develop organic light-emitting diodes exhibiting green and orange electroluminescence based on thermally activated delayed fluorescence (TADF) emitters (*J. Mater. Chem. C* 2021, 9(11), 3928. DOI: 10.1039/D0TC05745B)

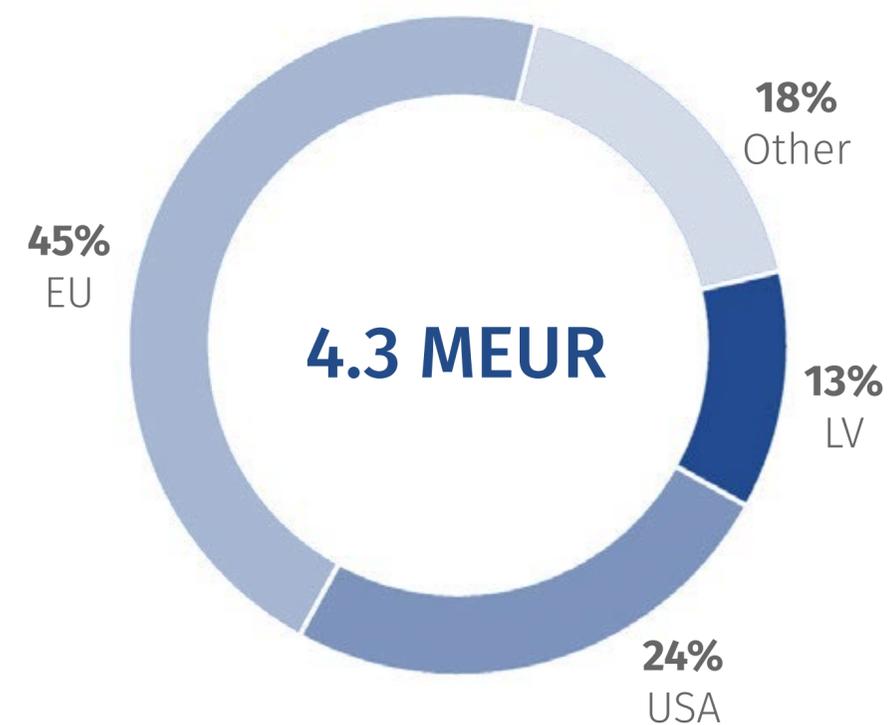


Partnerships with Industry



Last year, around 36% of funding (MEUR 4.3) has 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, 2021



Contribution to the pandemic preparedness

In response to global health crisis caused by COVID-19 pandemic, LIOS researchers have been involved in several projects and consortia for the development of new vaccine candidates and small molecule drug leads, directed against coronaviruses and its complications. The largest initiative was Latvian state research program funded project "Towards new therapeutic and prophylactic treatments against Covid-19 and coronaviruses" (VPP-COVID-2020/1-0014). The research activities of this project were started in 2020 to bring the first scientific outcomes in 2021.

- + New chemotypes of inhibitors for SARS-CoV-2 mRNA cap methyltransferase as a potential anti-virals were discovered by the team led by prof. K. Jaudzems.
 - Bobiļeva, et. al. *CS Med. Chem. Lett.* 2021, 12, 1102. DOI: 10.1021/acsmchemlett.1c00140
 - Bobrovs et. al. *Pharmaceuticals* 2021, 14, 1243. DOI: 10.3390/ph14121243
 - Patent application: PCT/IB202/061623
- + New method for the conjugation of peptides, glycoproteins, antibodies, and virus-like particles (VLPs) useful for the development of vaccines were developed as a collaborative efforts of prof. E. Suna with researchers from Biomedical Research and study centre and company Genie Biotech.
 - Brune et al. *ChemBioChem* 2021, 22, 3199. DOI: 10.1002/cbic.202100381
- + A study led by Dr. R. Vilskerts from the group of Prof. M. Dambrova has shown that meldonium therapy can help to prevent cardiovascular complications in COVID-19 patients.
 - Vilskersts. et al. *Int. J. Mol. Sci.* 2022, 23(1), 45. DOI: 10.3390/ijms23010045



Major Scientific Breakthroughs

ELECTROSYNTHESIS METHOD FOR THE GENERATION OF HYPERVALENT BROMINE

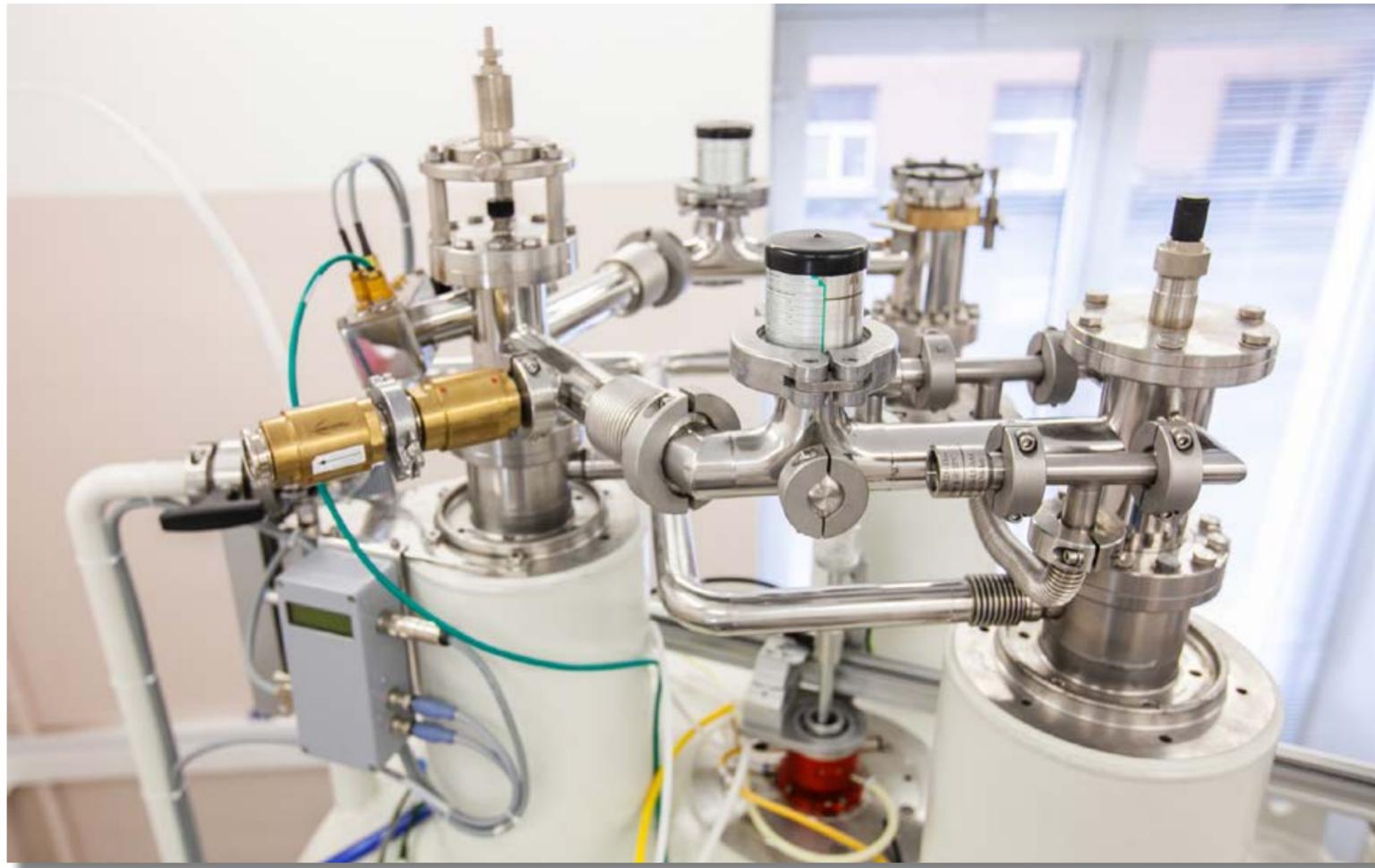
Prof. **Edgars Suna** and PhD **Igors Sokolovs** in collaboration with group of prof. Robert Franke have developed electrosynthesis method for obtaining hypervalent bromine reagents. The discovery solves a long-standing scientific challenge and opens the door to valuable chemical reagents and unprecedented transformations. The Latvian Academy of Sciences has announced this research as one of the most significant achievements in Latvian science in 2021.

The scientific background of the research is published in:
Angew Chem. Int. Ed. 2021. DOI: 10.1002/anie.202104677





METHOD FOR STRUCTURAL CHARACTERIZATION OF ANTIGENS COUPLED TO VIRUS-LIKE PARTICLES



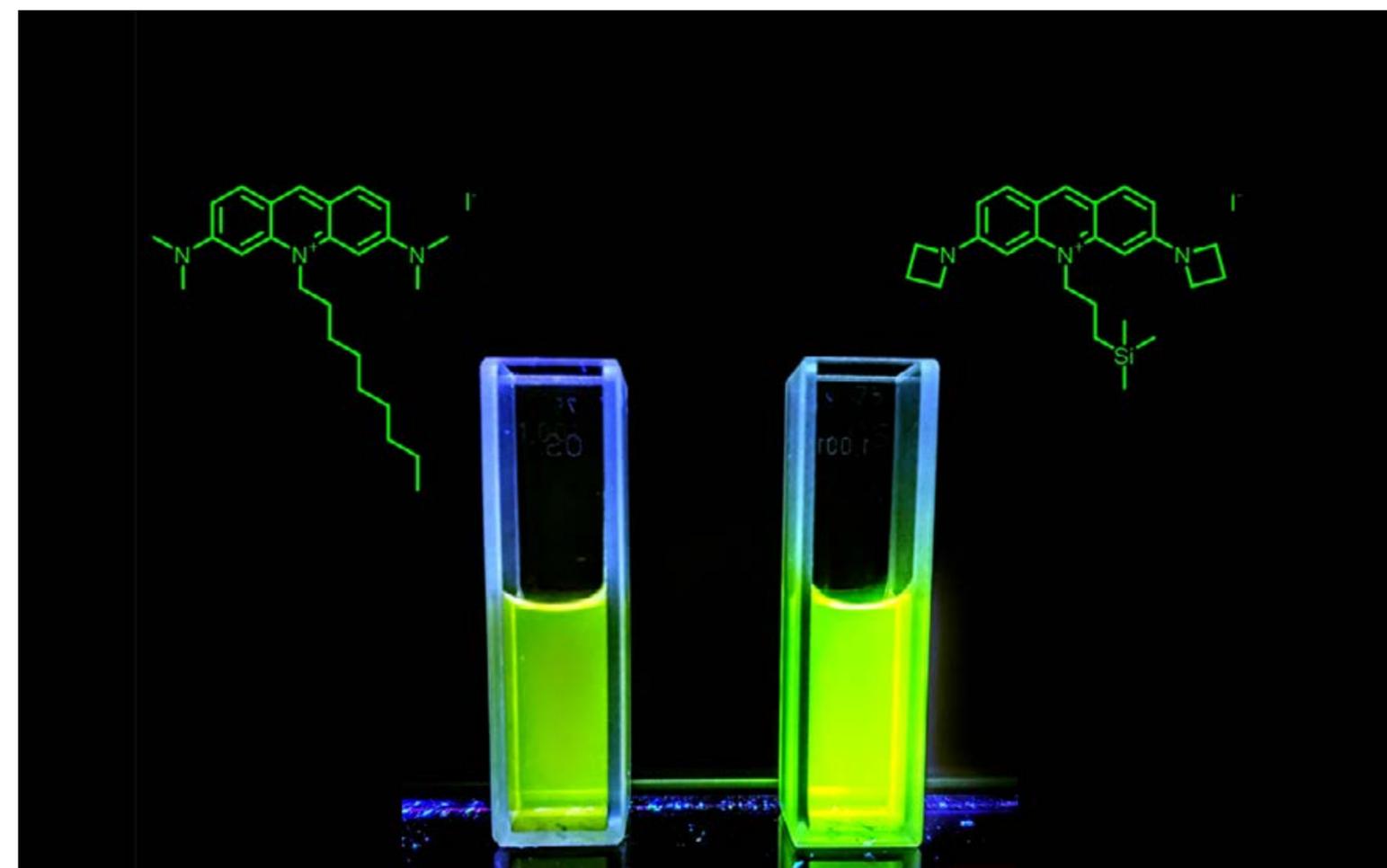
Prof. **Kristaps Jaudzems** together with researchers from the Latvian Biomedical Research and Study Center, University of Aix-Marseille, and the University of Lyon have developed a method for observing antigen molecules at atomic resolution and characterizing their structure when coupled to virus-like particles as adjuvants. The method will facilitate the design of vaccines as well as their formulation and production method development. The Latvian Academy of Sciences has announced this research as one of the most significant achievements in Latvian science in 2021.

The scientific background of the studies is published in:
Angew Chem. Int. Ed. 2021. DOI: 10.1002/anie.202013189



FLUORESCENCE PROBE FOR QUANTIFICATION OF CARDIOLIPIN

Leading researcher at LIOS PhD **Pavel Arsenyan** and his PhD student **Pavel Dimitrijevs** have developed a photoprobe for quantitative determination of cardiolipin. The method is a useful tool for the discovery of drugs related to mitochondrial diseases. This research has been awarded the acknowledgement of the Senate of the Latvian Academy of Sciences in 2021.



The scientific background of the studies is published in:
Sens. Actuators B: Chem. 2021. DOI: 10.1016/j.snb.2021.130537
Patent application. PCT/IB2020/058457

Awards



We are proud to announce that thirteen LIOS employees were granted various international awards and honours.

PhD **Pavel Arsenyan**

Award of Paul Walden for research in the selenium chemistry

PhD **Igors Sokolovs**

Prof. **Edgars Sūna**

Prof. **Kristaps Jaudzems**

Achievement in science of Latvia 2021 awarded by Latvian Academy of Science

Prof. **Ivars Kalviņš**

PhD **Kārlis Pajuste**

Diploma of the President of the Latvian Academy of Sciences

MSc **Pavels Dimitrijevs**

PhD **Pavel Arsenyan**

Acknowledgement of the Senate of the Latvian Academy of Sciences

Dr. **Dana Kigitoviča**

L'ORÉAL Baltic award "Women in science"

PhD **Marija Skvorcova**

Award of Edvīns Vedējs

PhD **Edijs Vāvers**

Award of Solomon Hiller

MSc **Georgijs Stakanovs**

Chemistry Award of Mārtins Straumanis and Alfrēds Ievins

MSc **Kristīne Kitoka**

Junior scientist Award of Latvian Academy of Sciences

MSc **Madara Dārziņa**

Junior scientist Award of Latvian Academy of Sciences

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 2021 nine BSc, seven MSc and three PhD thesis were defended.

DEFENDED THESIS



To financially support the students attaining their thesis at LIOS, we have launched the LIOS scholarship program. In 2021 we have awarded 11 scholarships and we have allocated EUR 307 thousand in total for that purpose.

Career Development

At the senior level, a remarkable development of their academic career was achieved by several of our employees.



Prof. **Kristaps Jaudzems**
Chair of Senate of
University of Latvia



Dr. **Līga Zvejniece**
Full Member of Latvian Academy
of Science



Dr. **Reinis Vilšķersts**
Corresponding Member of
Latvian Academy of Science

Resources

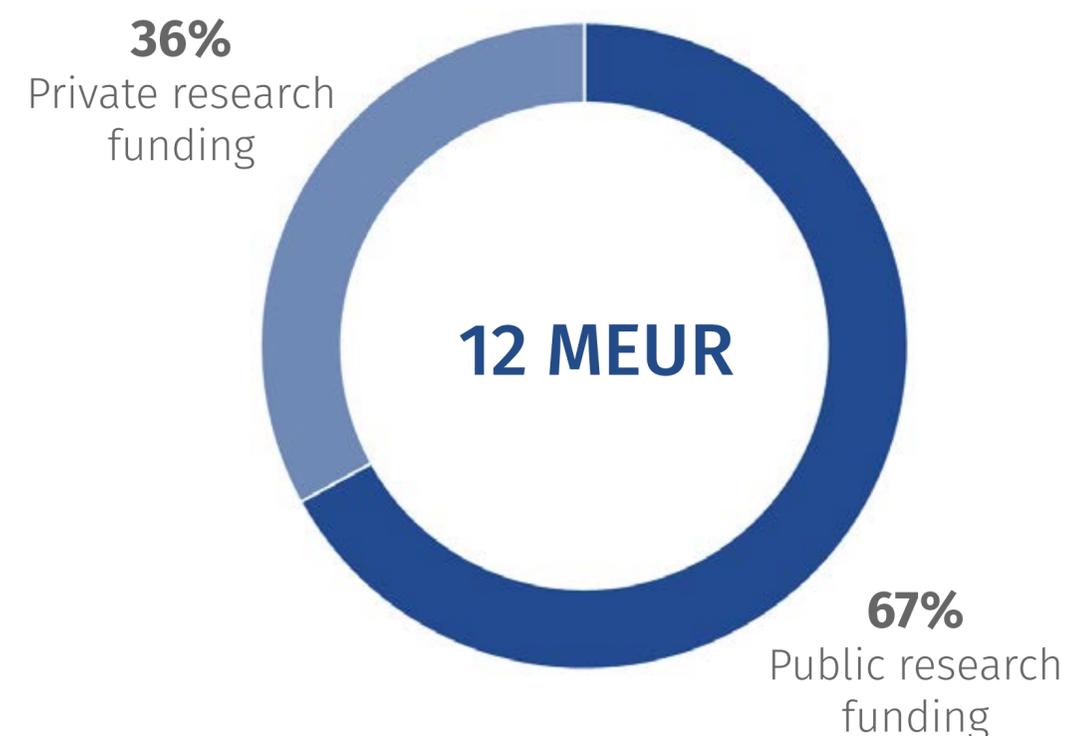
FINANCIAL RESOURCES

The total funding for 2021 reached 12 MEUR, where more than one-third of it was supplied by private partners.

At the end of the year 2021, we have achieved a solid financial position for our operations and development.

LIOS has exceptionally high liquidity (liquidity ratio – 4.5) and low debt burden (long term liabilities as a % of total assets – 2.4%). We closed the books with MEUR 5.4 in long and short term deferred revenue account (21% of the total book value), suggesting for a considerable volume of projects in the pipeline. Robust MEUR 7.44 were accumulated in cash on the 31st of December 2021.

TOTAL FUNDING, 2021



RESEARCH EQUIPMENT

In 2021 we have invested around MEUR 1.26 in research equipment.¹ The largest investment was a new triple quadrupole mass spectrometer with world-class sensitivity and detection speeds LCMS-8060NX. Acquisition of this instrument allowed to increase the throughput of our bioanalytical team by roughly 20%. This is the last generation instrument characterized by extreme robustness and ease of use.

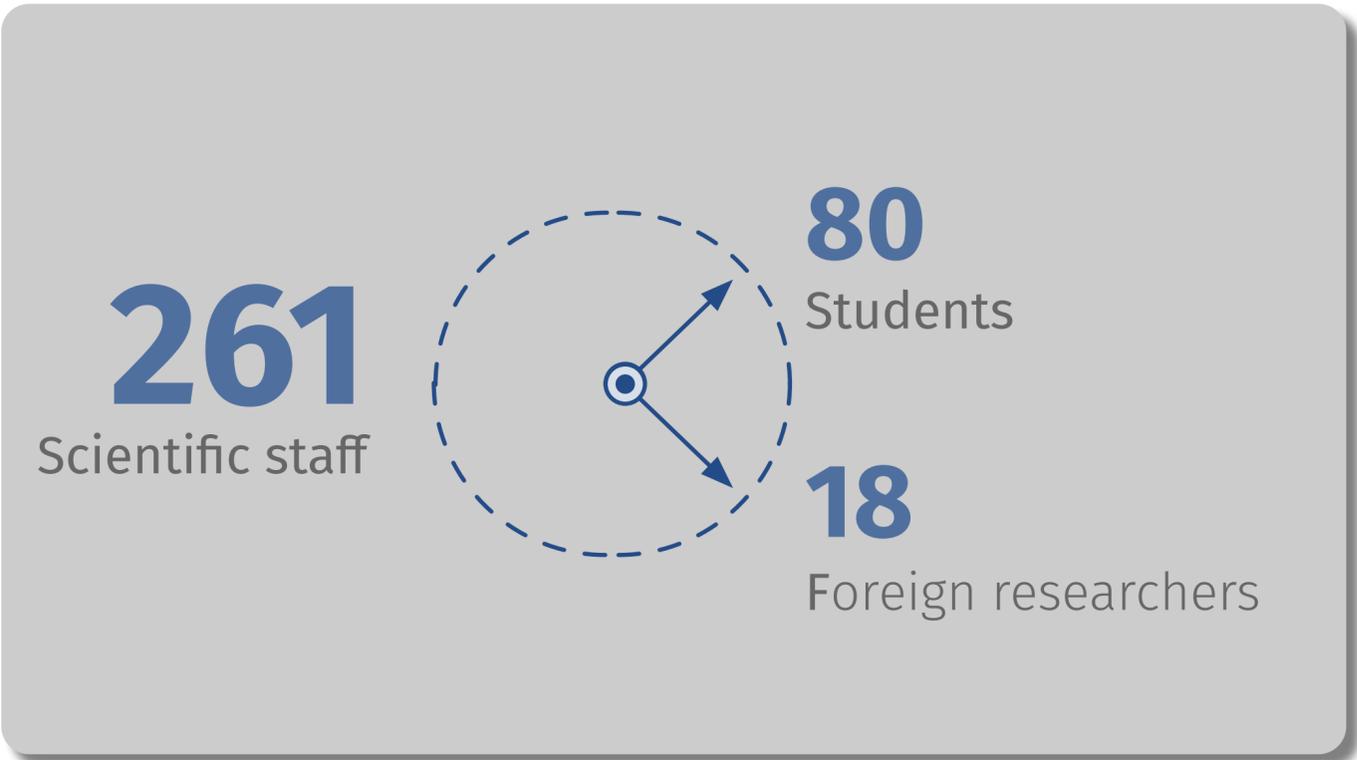


¹The funding is secured by European Structural and Investment Fund project No. 1.1.1.4/17/1/007

Photo <https://www.shimadzu.com>

PEOPLE

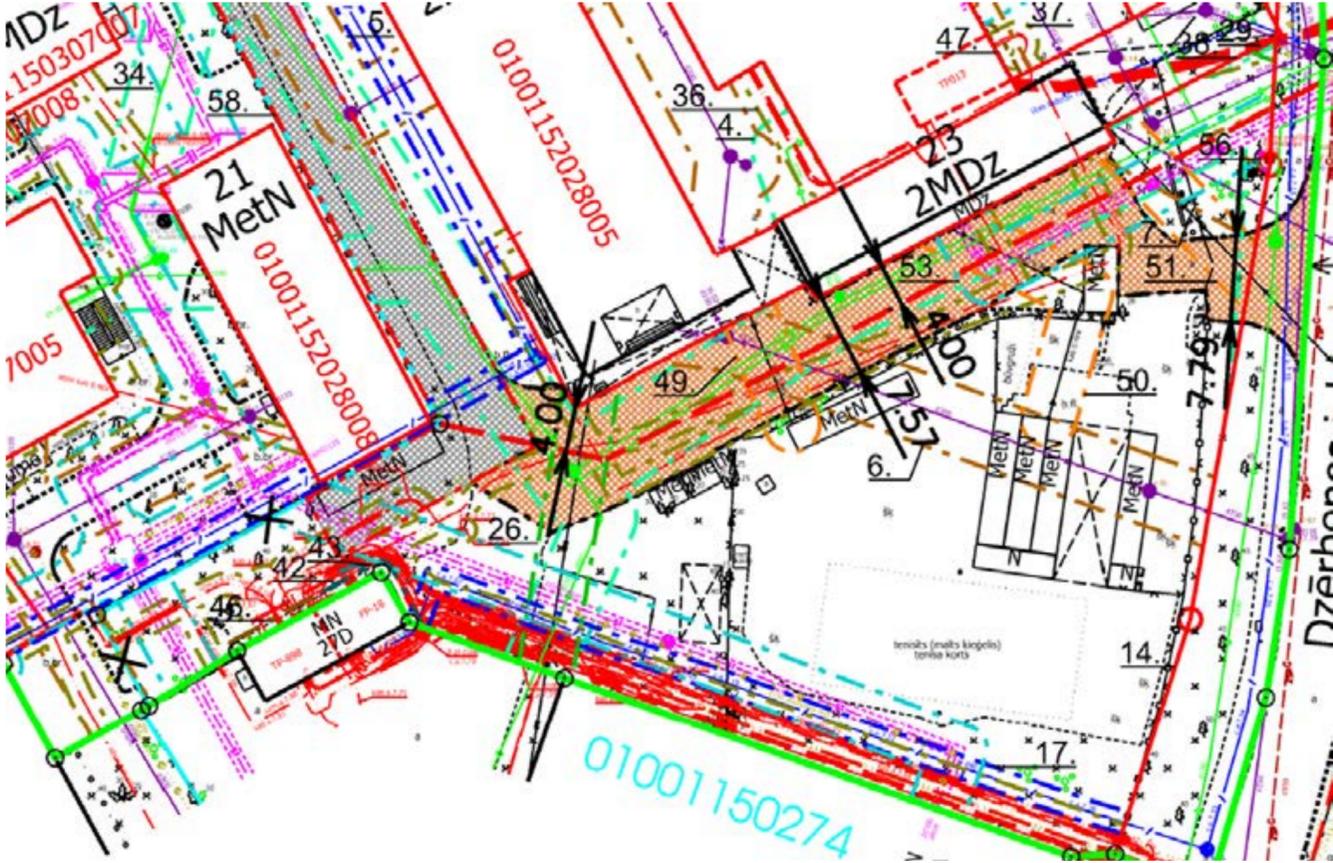
At the end of 2021, we are happy to count around 80 students and 18 foreign researchers among our scientific staff.



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 11,6 thousand per person). In total EUR 110 thousand were allocated to the employee motivation scheme.

ESTATE

In 2021 we have invested EUR 800 thousand in the new Biotechnology building aimed for needs of the Biotechnology group.¹



In 2021, the Cabinet of Ministers has allocated an additional land of 0.3561 ha to LIOS, thus providing additional resources for our territorial development plans in the coming years.

¹The funding is 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).

The SB of LIOS makes decisions on strategic research directions, approves budgets and elects the Management Board of the LIOS. Members of the SB are elected by the General Assembly of LIOS. The scientific council is composed of 15 members and it is the supervisory body of LIOS.

A new SB was elected at the end of 2018 its powers will expire in December 2022. To avoid conflict of interest and mitigate the agency's problems the supervisory body is entirely separated from the executive level.



Prof. **Edgars Sūna**
Chairman of the SB



Prof. **Kristaps Jaudzems**
Deputy Chairman of the SB



Dr. **Pāvels Arsenjans**



Prof. **Maija Dambrova**



Prof. **Ivars Kalviņš**



Dr. **Mārtiņš Katkevičs**



Dr. **Edgars Liepiņš**



Dr. **Ilga Mutule**



Dr. **Vita Ozola**



Dr. **Kārlis Pajuste**



Dr. **Aiva Plotniece**



Dr. **Gints Šmits**



Dr. **Kirills Šubins**



Dr. **Pēteris Trapencieris**



Prof. **Raivis Žalubovskis**

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 Kārkle
Deputy Director



Osvalds Pugovičs
Director



Aigars Jirgenšons
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. Under the governance reform for higher education institutions initiated by the Ministry of Education and Science, we aim to seek ways to engage in the supervisory body our stakeholders – students, industry representatives, international academia, policymakers and the general public.

Summary Annual Report for 2021

Fiscal year	2021
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	01.01.2021–31.12.2021
Auditor	KPMG Baltics SIA

Independent Auditors' Report



KPMG Baltics SIA
Vešetas iela 7,
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Latvija

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kpmg@kpmg.lv

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 2021, 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 2021.

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 2021 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 11 March 2022.

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
Rīga, Latvia
11 March 2022

KPMG Baltics SIA, Latvijā reģistrēta sabiedrība ar ierobežotu atbildību un KPMG neatkarīgu dalībfirmu, kuras saistītas ar Apvienotajā Karalistē reģistrētu privātu garantiju sabiedrību "KPMG International Limited", globālās organizācijas dalībfirmu.

Financial statements

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

ASSETS

	2021	2020
Non-current assets	15 220 068	14 643 066
Intangible assets	16 041	16 074
Licenses, patents, trademarks	16 041	13 293
Prepayments for licenses, patents, trademarks	-	2 781
Property, plant and equipment	15 204 027	14 626 964
Land and buildings	6 543 197	6 651 757
Technological equipment	7 272 976	7 731 887
Other equipment	157 821	148 046
Establishment of PPE and assets under construction	759 379	62 079
Prepayments for assets	470 654	33 195
Long term financial investments	-	28
Current assets	10 173 026	11 218 569
Inventory	36 246	25 272
Short term receivables	2 342 120	2 110 296
Prepaid expenses and advance payments for services and projects	347 084	321 340
Cash and cash equivalents	7 447 576	8 761 661
TOTAL ASSETS	25 393 094	25 861 635

EQUITY AND LIABILITIES

	2021	2020
Equity	18 638 233	18 808 327
Surpluses/Deficits	18 638 233	18 808 327
Accumulated surpluses	18 808 327	19 471 066
Surplus/Deficit of the financial period	(170 094)	(662 739)
Liabilities	6 754 861	7 053 308
Long term liabilities	4 498 363	985 421
Long term loans	604 291	703 327
Long term deferred income and received prepayments	3 894 072	282 094
Short term part of long term liabilities	101 815	102 195
Accounts payable	126 257	50 968
Current accrued liabilities	440 885	298 244
Current liabilities for taxes and dues	31 788	78 878
Other current liabilities	51 662	-
Deferred income, received prepayments and transfers	1 504 091	5 537 602
TOTAL EQUITY AND LIABILITIES	25 393 094	25 861 635

STATEMENT OF FINANCIAL PERFORMANCE

(euro)

	2021	2020
Revenue	12 384 380	11 136 224
Contract research revenue	4 310 345	4 116 259
International grants revenue	831 640	1 554 195
Transfers	7 096 088	5 436 051
Other revenue	146 307	29 719
Expenses	(12 545 638)	(11 786 245)
Staff cost	(7 699 454)	(7 245 540)
Travel costs	(50 680)	(35 766)
Services	(1 541 763)	(1 268 394)
Goods and materials used	(1 394 907)	(1 430 419)
Taxes	(15 069)	(9 713)
Interest expenses	(7 830)	(8 761)
Depreciation and amortisation	(1 832 952)	(1 782 236)
Other costs	(2 983)	(5 416)
Deficit or Surplus before other gains	(161 258)	(650 021)
Gain or loss on financial instruments	(8 836)	(12 718)
Total Deficit or Surplus	(170 094)	(662 739)

CASH FLOW STATEMENT

(euro)

	2021	2020
Total cash income	11 978 918	13 845 627
Total cash outflow	(13 293 003)	(11 329 128)
Net cash from operating activities	1 298 507	3 261 675
<i>Cash income from operating activities</i>	11 978 918	13 845 627
Contract research income	4 290 042	4 614 911
International grants income	434 513	2 954 570
Transfers	7 254 363	6 276 146
<i>Cash outflow from operating activities</i>	(10 680 411)	(10 583 952)
Staff cost	(7 601 733)	(7 204 301)
Travel costs	(54 545)	(34 491)
Services	(1 469 344)	(1 365 294)
Goods and materials used	(1 424 654)	(1 518 235)
Taxes	(31 898)	(6 718)
Subsidies, grants and social benefits, current payments to	0	(386 061)
European Union budget and international cooperation	(25 930)	(386 061)
Transfers for operating activities	(72 307)	(68 852)

Net cash from investing activities	(2 505 552)	(637 126)
<i>Cash income from investing activities</i>	-	-
<i>Cash outflow from investing activities</i>	(2 505 552)	(637 126)
Acquisition of and prepayments for intangible assets	(9 330)	(5 284)
Acquisition of and prepayments for property, plant and equipment	(1 624 460)	(534 359)
Establishment of PPE and assets under construction	(871 762)	(97 483)
Net cash from financing activities	(107 040)	(108 050)
<i>Cash outflow from financing activities</i>	(107 040)	(108 050)
Loans and issued debt securities	(99 036)	(99 036)
Interest expenses	(8 004)	(9 014)
Net cash flow before exchange rate effect	(1 314 085)	2 516 499
Net cash flow	(1 314 085)	2 516 499
Cash and cash equivalents at beginning of period	8 761 661	6 245 162
Cash and cash equivalents at end of the period	7 447 576	8 761 661

NOTE TO THE SUMMARY FINANCIAL STATEMENTS

The financial statement summary comprises the statement of financial position as at 31 December 2021, 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 financial statement summary is consistent with the objective of the financial statement summary.