

2022

ANNUAL
REPORT

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SCIENCE

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Research infrastructures are increasingly part of an interconnected ecosystem that provides a unique resource for advanced research and interdisciplinary analysis of complex scientific problems.

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ESFRI Roadmap 2021

2022 was a very exciting, successful year, and we were able to focus on our core mission: enabling new discoveries. Our core facilities (CF) have become an integral part of the academic and commercial research at the Vienna BioCenter, acting as scientific collaborators and natural link between both worlds. The demand for our scientific service provisions, expertise, and experience is growing continuously. In parallel, the pace of technology turnover and the number of emerging methods is ramping up quickly. As a result, the need for interdisciplinary research teams provided by shared research infrastructures (RI) like the VBCF was greater than ever.

Nearly 20 years after the initial commercialization of the first Next Generation Sequencing (NGS) system and 15 years after the setup of the first NGS platform at the VBC, NGS technology continues to evolve rapidly. In 2022, our **CF Next Generation Sequencing** implemented technological improvements in automated sample preparation and single-cell sequencing.

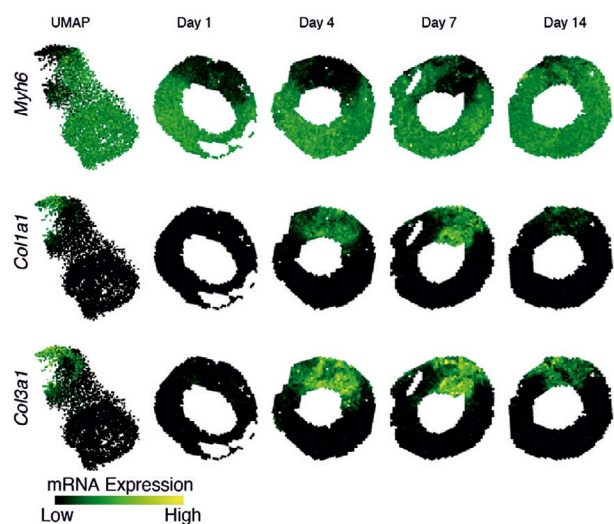
Sample handling automation and robotic library preparation have been key development fields in the CF in the last few years. Automating sample preparation improves the efficiency, accuracy, and reproducibility of scientific results, ultimately leading to higher-quality data and scientific rigor. Moreover, automation opens the door to the miniaturization of library preparation protocols. The CF successfully downscaled several protocols by combining a contact-free nanoliter dispenser with a 384-head liquid handling robot.



Automation using the 384-head liquid handling robot Biomek i7 opened the door to the miniaturization of sample preparation protocols.



Single-cell sequencing has revolutionized our understanding of cellular biology. It has opened up new avenues for research in various fields, including cancer biology, developmental biology, and neuroscience. Consequently, the number of requests for single-cell sequencing from our user base has steadily increased over the past year. In 2022, the CF updated its service portfolio and strengthened the workforce accordingly to increase capacity for single-cell sequencing and spatial transcriptomics (in collaboration with our CF **Histology**). The CF is committed to bringing these advances to the Vienna BioCenter and shaping them into routine, cost-efficient services.

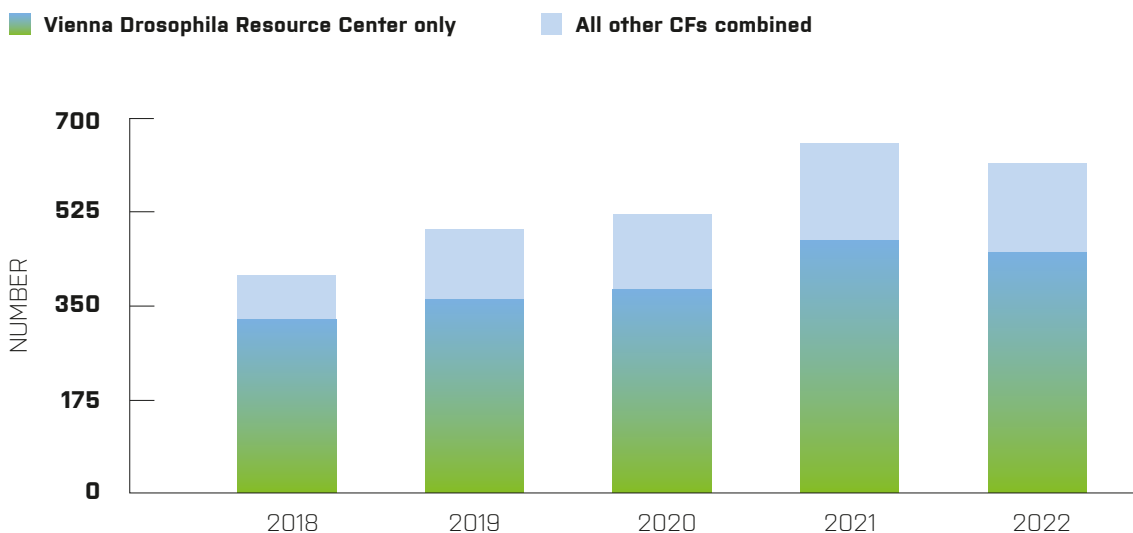


Spatial transcriptomics can reveal gene expression differences in a mouse myocardial infarction model. The results suggest a treatment strategy to reduce scarring of heart tissue during recovery. Used with permission from Miyara S. et al.

In 2015, we received generous funding from the Vienna Business Agency in the context of a shared research facility (SRF) grant. The aim was to establish at the Vienna BioCenter a scientific infrastructure for Metabolomics – the quantification of biomolecules resulting from metabolic processes. The SRF funding has financed the startup phase of our **CF Metabolomics** till the end of 2021 in collaboration with Boehringer Ingelheim and two of our shareholders, IMP and IMBA. In 2022, the project was completed successfully with a positive evaluation by the Vienna Business Agency. The facility will be operated within the framework of the VBCF, focusing on improving the robustness and standardization of workflows as well as increasing the accuracy and reliability of implemented assays.



SCIENTIFIC CONTRIBUTIONS OF VBCF OVER THE LAST FIVE YEARS



In 2022, our expert team contributed to 617 scientific, peer-reviewed publications in high-profile journals such as **Nature**, **Science**, and **Cell**, continuing a steady upward trend over the last five years.

FINANCE



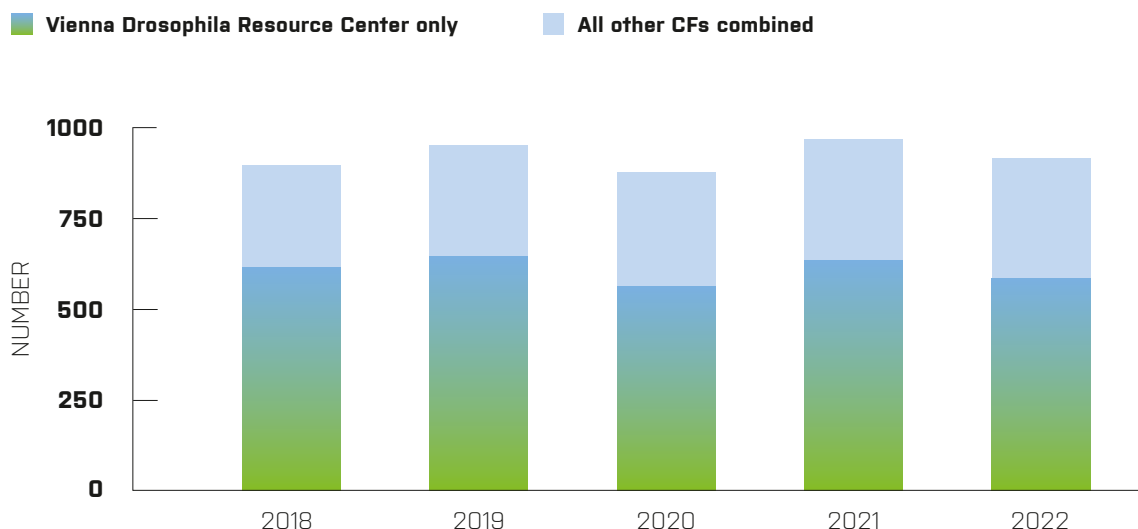


The VBCF has recovered its personnel costs from user fees, a first in the history of the VBCF and unmet by any other RI in Europe.



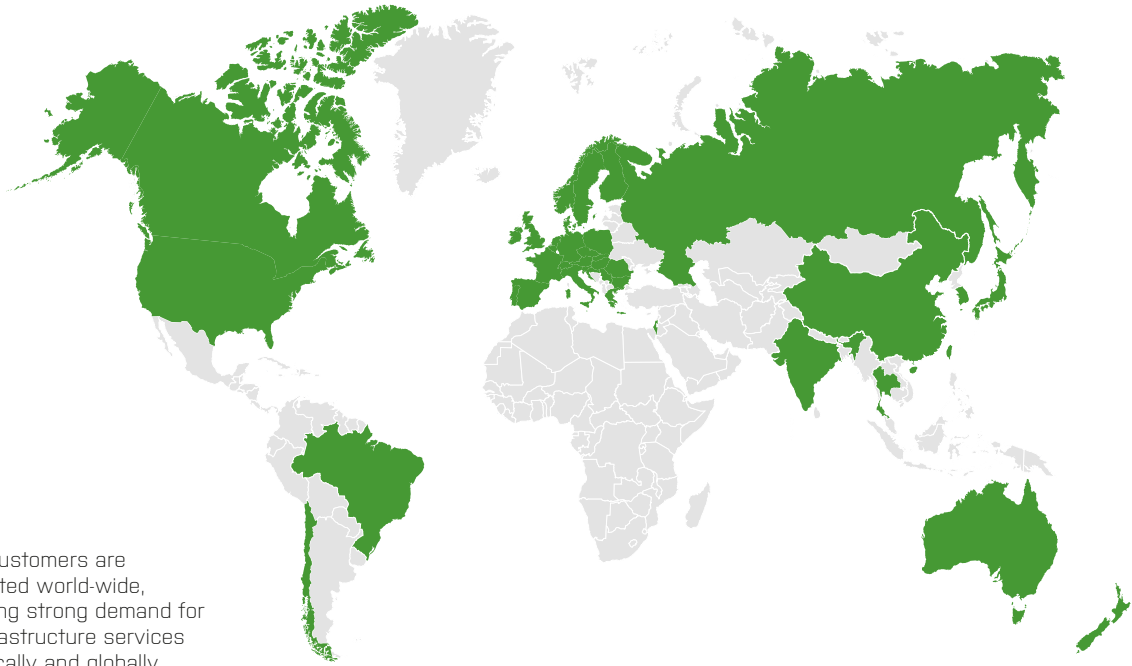
In 2022, we observed a decline in our user base of 6%, resulting in a total number of 911 groups. The decline is explained by natural fluctuations in the global user base of our CF **Vienna Drosophila Resource Center** (VDRC, +94 groups in 2021 vs. -49 groups in 2022) and the discontinuation of the Vienna Covid-19 Detection Initiative (VCDI). Nevertheless, the VDRC contributes the highest number of user groups (584), showing the core facility's scientific relevance and global reach. All other CFs showed a stable user base while fluctuation is within normal patterns.

USER BASE
OVER THE LAST FIVE YEARS



VBCF CUSTOMERS

2022



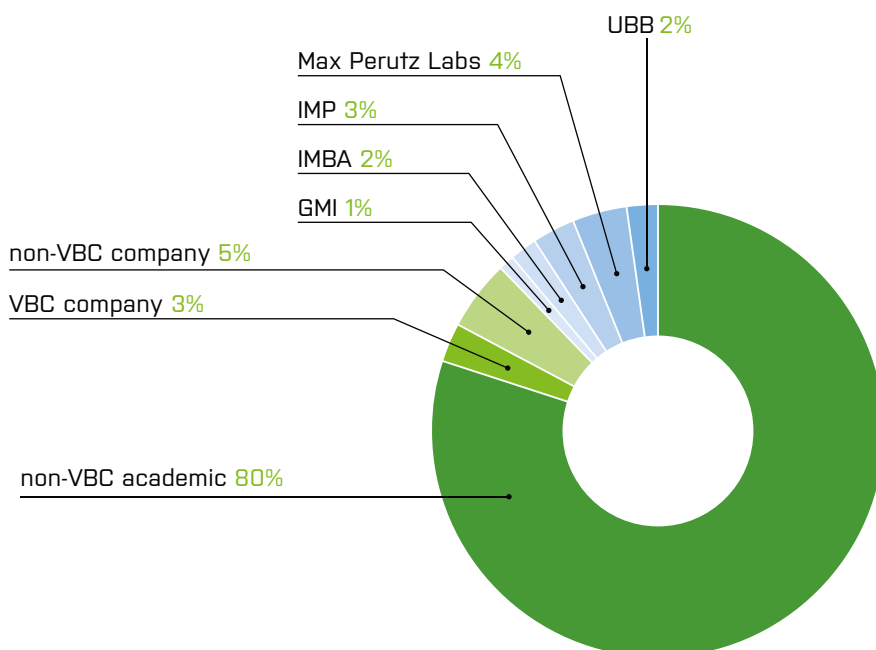
VBCF customers are distributed world-wide, indicating strong demand for our infrastructure services both locally and globally.

USER BASE ANALYSIS

2022

The dominance of academics in the user base continues with a share of 92%, while companies account for 8% of our user base. Within the VBC academics, all research groups at GMI, IMBA, and

IMP, 40 groups at the Max Perutz Labs, and 18 groups from UBB are users of VBCF, reflecting that our scientific service provisions are an excellent fit for the local research requirements.



“ CFs were able to stabilize their relatively high levels of income. ”

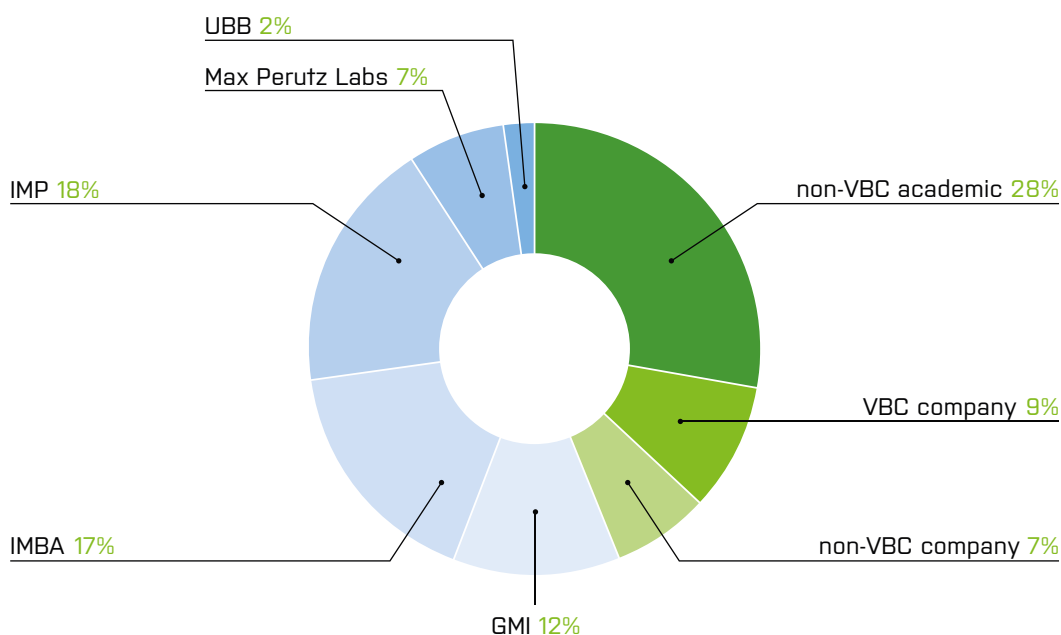
After the record year 2021, VBCF experienced a decrease in income of 15%. The main share of the decline (10%) is attributed to the discontinuation of the VCDI. While most CFs were able to stabilize their relatively high levels of income, three CFs showed impressive growth numbers. The successful start of PHENOPlant operations within our CF **Plant Sciences** led to a 22% increase in income. Our CF **Preclinical Phenotyping** was able to top its strong results of the two previous years and increased its income by 38%. Our CF **Protein Technologies** grew its income by 13%, a remarkable success for this unit.

INCOME DISTRIBUTION

2022

User fees from academic customers decreased by 3,4%, while the income from collaboration with Companies declined by 12%. Nevertheless, the historical comparison shows a 2,8-fold increase in Company income from 2019 to 2022, a noteworthy achievement even when corrected

for inflation. Consequently, we are confident that VBCF’s value proposition is attractive to company customers. Following our mission, the focus on VBC users remains intense, with a share of 65% of our total income.



COMMUNITY





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How do we – scientifically, socially, economically & ecologically – sustainably address the scientific need for a continuously growing and evolving RI without dedicated funds to support growth?

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To address this common dilemma (stability vs. growth) to well-established RIs, we, together with our strategic partners of **Core for Life (C4L)**, started to tackle this question more systematically. As one of the driving forces behind C4L, we have kicked off a C4L funding scheme for innovative projects, aiming to strengthen collaborations between institutions and accelerate R&D. The emerging concepts aim to guarantee dedicated R&D resources for the establishment of new or the refinement of existing CFs and their service provisions. These strategic considerations are essential to secure our cutting-edge and maximize the scientific output with current resources.

These refinements alone, however, can only partially address our 'central dilemma'. As a result, the VBC leadership has decided that the VBCF will sequentially take over the **CF management for selected in-house CFs**, aiming to capitalize on synergies and carefully open their service provision to VBC researchers. This management transfer illustrates the successful transformation of VBCF into a professional, reliable, and strategic collaborator for unique scientific service provisions. This Austrian success story did not go unnoticed, and the VBCF has become a lighthouse project for other RIs in Europe and beyond.



As in previous years, our **CF Strategic Information Management (SIM)** provided software development services that benefited the entire VBC campus. The SIM team implemented a unified data analysis, billing and reporting system for seven VBC core facilities by connecting heterogeneous resources of CF software systems to one data warehouse. Such a centralized software system greatly simplifies customer request management and administration, thereby streamlining core facility operations. Furthermore, the SIM team deployed a modular and flexible VBC eCommerce platform that can be used for various applications, such as web shops, event registration pages, or contractual document administration.

For many years, VBCF has operated the **VBC Childcare Center**, thus promoting the onboarding of ex-pats and increasing the compatibility of career and family for all VBC employees. In 2022, the Childcare Center was in normal operations and launched a STEM program giving children the opportunity to immerse themselves more deeply in the world of science, e.g., during visits to the Vienna Open Lab.



VBCF Administration took over administrative and marketing (branding) responsibilities for the VBC association in 2021. This year, we have further improved the services of VBC members by opening the VBC Sports program to all VBC employees. Initially founded by individual sports enthusiasts looking for like-minded colleagues, the VBC Sports program has developed into a campus-wide, mature employee incentive. Generous funding through VBC membership fees allows us to offer various sports activities, from ball and racket sports to CrossFit, Yoga, and Zumba. The VBC Newsletter has become an integral part of campus-wide communication activities. Through these improved services for the whole VBC campus, we hope to foster cohesion, facilitate the onboarding of ex-pats, and create a shared identity for all VBC employees.



IMPRESSUM

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