ARTICLE

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Optimize collaboration and maximize efficiency of drug discovery projects to accelerate innovation

Introduction

The last twenty years have seen exponential growth in the drug discovery contract research organization (CRO) market. Most companies now outsource at least some, if not all, aspects of their research, whether that is to minimize risk and reduce costs, to take advantage of expertise not available in-house or to expand into new therapeutic areas. CROs enable larger pharmaceutical firms to pursue an increased number of programs and stay ahead of competitors in the use of new technologies; while for smaller biotech companies, CROs fill the gaps in infrastructure that would require too high an investment to create in-house.

Biopharmaceutical companies are feeling extreme pressure due to the amount of money, time and resources required to develop a new drug and so are using CROs earlier in the process than previously. According to Statista, as of 2023, the global CRO market is estimated at around $77 billion1 with a projected growth to $127 billion by 2028.

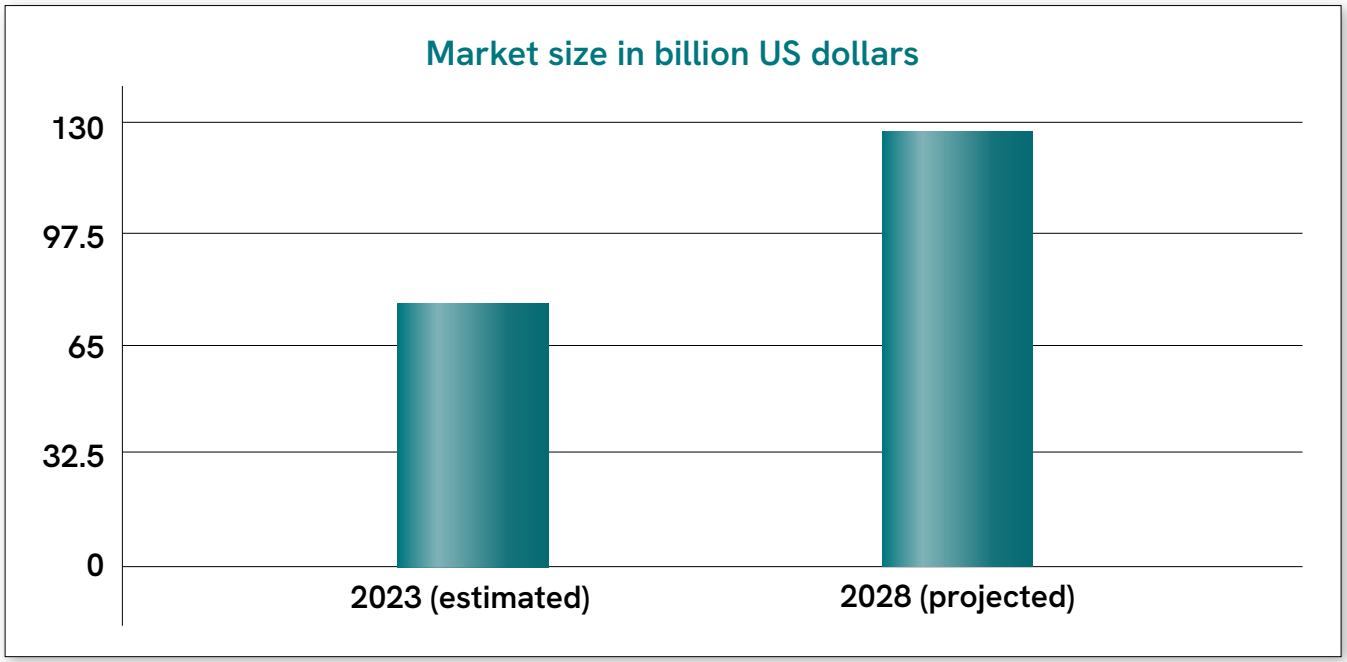

Figure 1: Global contract research organization (CRO) market in 2023 and 2028. Source: Statista2

The emergence of 'techbio' organizations and the constant development of new digital technologies in the drug discovery space, like artificial intelligence (AI) and machine learning (ML), are motivating a move to more data-driven drug discovery processes. The need to use techniques such as predictive modeling and proteomics, or new drug modalities such as antibodies, oncolytic viruses, and chimeras (PROTAC), to stay competitive means it is often necessary for companies to partner with several different CROs to take advantage of diverse skillsets and to get the best services at each stage of the drug discovery life cycle. This change in focus has been reflected in recent strategic collaborations, as biopharma competes to partner with companies offering AI-based technologies. Indeed, many smaller, specialized biotech companies are now outsourcing their technologies and know-how alongside their own pipeline of development candidates. This new collaborative way of working brings advantages but also its own set of challenges.

Challenge 1: Achieving effective project management

Errors in communication can be costly, so alliance and CRO management has become an important and ever-growing part of the drug discovery process, especially when CROs need to be onboarded and off-boarded at different phases of a project.

With multiple CROs, potentially working on multiple programs, from synthesis to screening, to preclinical in vivo studies, and across different time zones, it can a real challenge to keep an accurate record of project progress.

Communication between organisations can also be a significant issue – making sure that each CRO knows what is expected of them and when they need to deliver their data is vital to avoid any delays and errors in the process.

Challenge 2: Integrating accurate, standardized data

A greater focus on data-driven drug development means that data are more important than ever but are also increasingly complex and diverse. It could mean millions of dollars in savings if a company can identify successful compounds earlier in the drug discovery process, but this is reliant on the quality of the research data collected.

Working with multiple CROs often means that reports will be returned in varied and often unstructured formats, requiring a substantial amount of work before they can be used efficiently and productively for downstream analytics and to inform the next stage of the program. Standardizing the data is essential for using advanced analytics and visualization and new insightful tools like AI and ML, but this extra stage of data wrangling carries an additional risk that errors will be introduced.

Challenge 3: Sharing information while protecting security

Through necessity, companies are now outsourcing to CROs earlier in the drug discovery process, despite concerns over confidentiality issues, which previously meant these early-stage investigations were kept in-house.

Collaborating more widely also presents the administrative challenge of ensuring the security of the sponsor company's intellectual property

(IP) when working with several organizations that require different information and have varied levels of access. A successful working partnership is very important to the efficient workflow of a project and this can be constrained by concerns over security issues and IP leakage, preventing organizations from benefiting from the best expertise.

What is the solution?

Signals Synergy is an outsourcing and collaboration solution from Revvity Signals designed to ensure effective communication with CROs. The system-level expansion can be added to Signals Notebook or Signals OneTM to overcome challenges in communication, planning and information exchange.

Signals Synergy allows external data to flow seamlessly, by transforming reports with study or assay metadata, raw data, and analytic endpoints into computer-consumable structured data, using a robust library of transformation templates for CRO and assay-specific reports. The end-to-end workflow, from the very beginning of administration to using the data, is developed to reduce errors, time and resources while preserving the scientific integrity.

To ensure the operational efficiency of collaborative projects, Signals Synergy provides powerful, scientifically-minded project management tools inside the Signals platform. These tools enable the sponsor-CRO relationship and offer multiple benefits to both parties, for example, the sponsor company can easily track the progress of a lead through the pipeline. The sponsor can use the ideation space, a workspace for capturing drug designs and hypotheses, to gather diverse sources of information about a proposed molecule or a biologic design, empowering analytics to inform the next steps of the project with as little oversight as possible.

To facilitate free-flowing communication and trusted collaborations, the robust multi-layer security platform in Signals has been adapted to be fit-for-purpose for externalization. The flexibility and scalability of the system allow CROs to be stored and then simply added or removed from collaborations as required. Signals Synergy includes built-in masking of proprietary codes, properties and material IDs. CROs are ring-fenced from one another and there is flexibility at the level of each work request, allowing the sponsor to share as much or as little information as needed for a particular assay.

In summary, the goal of Signals Synergy is to accelerate drug discovery innovation through easier and more efficient sponsor and CRO collaborations and data sharing so that sponsors gain more insight with less oversight.

Learn more at https://revvitysignals.com/products/research/signals-synergy

References

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