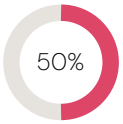
Ori Insights

How Combining Best-of-Breed Technology and Services Can Ensure Commercial Success for Cell and Gene Therapies.

May 2025

Cell and gene therapies (CGTs) don't just have the potential to save lives — they *are already* saving lives, with a record 10,000 patients treated in 2024.[1] Yet, despite their clinical success, CGTs remain inaccessible for most patients, leaving hundreds of thousands with no viable treatment options and facing devastating outcomes.

Why can't the industry deliver these incredible therapies to all patients who need them?



Cost of goods (COGs) analyses reveal that manufacturing contributes up to 50% of total COGs

The answer to this question isn't as straightforward as one might think. Historically, several promising cell and gene therapies have struggled or failed commercially despite demonstrating clinical efficacy. Therapies have been withdrawn or have experienced limited uptake due to their inability to scale production cost-effectively, manage complex logistics reliably, or reach financial viability once on the market. These commercial setbacks illustrate a critical reality: clinical success alone is insufficient if manufacturing and commercialization capabilities are not robust and scalable from the start.

Manufacturing inefficiencies, complex logistics/supply chains, and high prices often interact in a vicious cycle to inhibit accessibility despite clear clinical benefits.[2-4] With cost of goods (COGs) analyses revealing that manufacturing contributes over 50% of total COGs, addressing manufacturing inefficiencies is a logical first step toward improving CGT affordability and accessibility. Increasing manufacturing efficiency—particularly through automation of critical process bottlenecks like cell activation, transduction and expansion—has the potential to reduce labor by up to 65% and COGs by up to 50%, according to recent estimates.[2]

Ensuring widespread patient access to these life-saving therapies will require a flexible, connected, automated, and scalable manufacturing infrastructure[5,6] that can address CGTs' unique safety, efficacy, and commercial requirements.

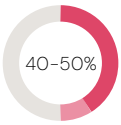
Addressing inefficiencies has the potential to:

Reduce manufacturing COGs by up to **65%**

Reduce total COGs by **50%**

Manufacturing Automation: Key to Immediate Cost Reduction

Scaling CGT manufacturing remains a significant challenge despite tens of billions of dollars of investment by the pioneers in the space. Unlike small molecules and biologics, which can be produced in large batches for millions of patients, today's CGTs are often personalized, living therapies manufactured one dose at a time (e.g. autologous cell therapies).[4,5] The process is further complicated by the circular supply chain, which requires the transport of a patient's own cells, often across thousands of miles by plane, to a manufacturing facility and back again. This complexity makes production, scheduling and logistics far more complicated than traditional drug manufacturing.



Experts estimate that manual labor accounts for 40-50% of total CGT manufacturing costs

Attempts to apply cost-saving strategies from small molecules and biologics to CGTs have largely failed. While approaches like introducing 2nd layer robotics for fluid transfers may offer modest improvements, they cannot resolve the core challenges of throughput, cost of goods (COGs) reduction, and quality improvements that remain barriers to affordable CGT manufacturing.

Experts estimate that manual labor accounts for 40-50% of total CGT manufacturing costs,[2] making automation a key driver of cost reduction. By automating and optimizing individual unit operations first, manufacturers can

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significantly lower expenses by reducing the total labor requirement, reducing reliance on highly skilled personnel, optimizing facility utilization, minimizing contamination risk, and enhancing process consistency. Adoption of robotics without unit operation optimization or "end-to-end" automation technologies that offer some incremental improvements, but also equal detriments, has been proven not to address the problems sufficiently.

Over the past few years, technology vendors have introduced "end-to-end" automation solutions to streamline the CGT manufacturing process. However, these solutions have proven too inflexible to meet the needs of today's cell therapies, having often been repurposed from other applications like regenerative medicine. These "jack of all trades, master of none" technologies usually perform some steps effectively but fall short in others, forcing therapy developers to sacrifice flexibility and biological performance for automation or to fall back to using them only for a single unit operation (e.g. cell selection). As a result, many developers must still rely on manual tools and/or additional technologies to compensate for these shortcomings, undermining the intended benefits of adopting an "end-to-end" system and leaving manufacturers no better off than with manual processing.

What Therapy Developers Really Want: Flexibility and Scalability

A successful automation strategy is built first upon strong biology: e.g. how cells are impacted by each automated step and their status at the end of each operation.[6] Deep consideration for biological performance, usually inhibited by the current engineering-led automation solutions, naturally leads to a set of core requirements for successful CGT manufacturing automation – flexibility and scalability.[6] Any CGT manufacturing automation platform worth considering needs to:

1

Ensure Consistency & Quality

- Generate consistent, high-quality biological outputs
- Minimize process variability to ensure reproducibility

2

Enhance Flexibility

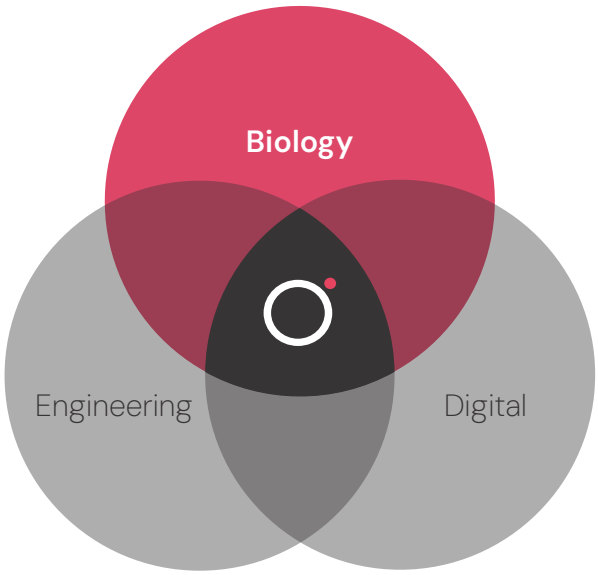
- Empower process developers to optimize and refine their processes
- Support and maintain diverse workflows and unique process operations
- Allow users to integrate the best-of-breed technologies and service providers as desired
- Enable customization of processing steps to address process-specific variability

3

Promote Scalability

- Shorten time to clinic
- Accelerate the path to clinical and commercial scale
- Smooth tech transfer and comparability to de-risk the path to scale

Successful automation is built first upon strong biology



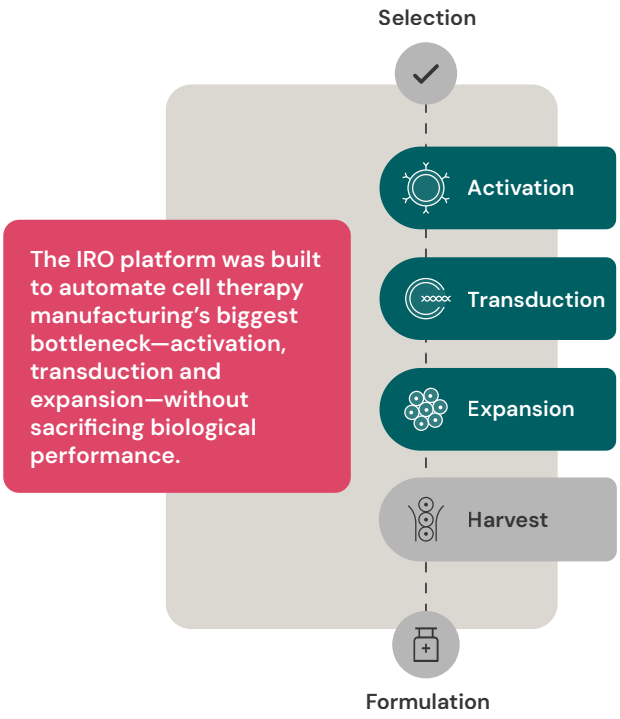
Today's "end-to-end" solutions are too rigid to reliably develop and manufacture high-quality, commercially viable CGTs at scale. In contrast, a flexible, modular approach—integrating best-of-breed technologies alongside expert service provision—offers a scalable and adaptable solution to CGT manufacturing challenges. Enabling therapy developers to choose the most effective tools, technologies (including software) and service providers in whom they have experience and trust – allows them to continually refine and improve their processes as new technologies emerge. Vertically integrated technology and service providers try to lock in developers, limiting flexibility and increasing risk by introducing a single point of failure that is out of the developer's control. These vertically integrated approaches haven't traditionally been successful as the developer loses control of their own destiny by putting all their eggs in one combined technology and CDMO basket. Ori developed the IRO® platform and launched its Preferred Partner Network to empower therapy developers and manufacturers to maintain control over their clinical and commercial destiny.

Automating Better Biology

Reduced flexibility and compromized biological performance are the most common complaints about the first-generation CGT manufacturing automation technologies and are a concession that is no longer necessary. The IRO® platform has been tested head-to-head against the current "(g)old standard" cell culture systems[7] demonstrating superior performance in the hands of experts like CTMC and Charles River Labs.

IRO's modular nature fulfills some of the most critical components of successful automation strategies: flexibility to adapt to the needs of each process while maintaining control of the process in the hands of the developer, all while ensuring superior biological performance at both R&D and GMP scale. In contrast to "end-to-end" automation platforms, IRO allows CGT therapy developers and manufacturers to rapidly optimize multiple processes, workflows, and cell types simultaneously, shortening time to clinic, minimizing batch failures, increasing throughput, and reducing costs.

IRO was designed to support development from R&D all the way through to GMP, acting as a foundational technology across a portfolio of programs. As a closed system, the IRO Platform can be stacked, simultaneously permitting parallel processing of cells from multiple patients in the same space, increasing throughput per ft^2/m^2, and facilitating rapid scale-up to commercial manufacturing. The impact is significant: shortening development times by up to 3 years, increasing throughput in the same footprint by 10-50x, lowering COGs by 30-50%, and reducing batch failure rates (to as low as an estimated ~5%), which are all key to solving CGT manufacturing's scale-up problem.



Significant Impact with IRO:

Development times shortened by up to
3 years

Throughput increased in the same footprint by
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COGs lowered by
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Batch failure rates reduced to as low as
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The New Standard for CGT manufacturing is here

Automating critical manufacturing bottlenecks with IRO® is a key lever for the industry to pull today to increase throughput immediately, lower costs, and improve quality to achieve commercial viability for the next generation of cell therapies. Automation that puts biology first while maintaining the flexibility needed to meet manufacturing and regulatory demands is here.

Alongside partners like Fresenius Kabi, Charles River Labs, ElevateBio, Kincell, and CTMC (a joint venture between MD Anderson Cancer Center and Resilience), Ori Biotech is putting together flexible, modular, best-of-breed technologies and services to address the critical challenges in CGT manufacturing.

Cell and gene therapy is at an inflection point, requiring innovative solutions to remove the barriers to accessibility, improve affordability, and fully unlock the life-saving potential of these incredible therapies before it's too late.

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