

## Bioprocessing

**SEGMENT SPOTLIGHT** 



SUMMER 2023

## **About Our Firm**



Houlihan Lokey is a leading global investment bank with expertise in mergers and acquisitions, capital markets, financial restructuring, and financial and valuation advisory.

Our firm is the trusted advisor to more top decision-makers than any other independent global investment bank.

We invite you to learn more about how our bankers can serve your needs:

> Learn More About Corporate Finance

Learn More About Financial Restructuring

Learn More About Financial and Valuation Advisory

> Learn More About Our Industry Coverage

#### **Key Facts and Figures**



#### Our Ranking by Service

#### **Corporate Finance**

2022 M&A Advisory Rankings Global Transactions Under \$1 Billion				
Advisor Deal				
1	Houlihan Lokey	381		
2	Rothschild & Co	369		
3	JP Morgan	217		
4	Lazard	206		
5	Goldman Sachs & Co	203		
Source: Refinitiv. Excludes accounting firms and brokers.				

#### No. 1 Global M&A Advisor Under \$1 Billion

Leading Capital Markets Advisor

#### **Financial Restructuring**

2022 Global Distressed Debt & Bankruptcy Restructuring Rankings				
	Advisor	Deals		
1	Houlihan Lokey	58		
2	PJT Partners Inc	30		
3	Lazard	29		
4	Rothschild & Co	25		
5	Moelis & Co	21		
Sou	rce: Refinitiv.			

No. 1 Global Restructuring Advisor

**1,500+** Transactions Completed Valued at More Than \$3.0 Trillion Collectively

#### Financial and Valuation Advisory

	98 to 2022 Global M&A Fairness visory Rankings	
	Advisor	Deals
1	Houlihan Lokey	1,232
2	JP Morgan	1,030
3	Duff & Phelps, A Kroll Business	938
4	Morgan Stanley	725
5	BofA Securities Inc	710
Sour	ce: Refinitiv. Announced or completed transactions.	

**No. 1** Global M&A Fairness Opinion Advisor Over the Past 25 Years

1,000+ Annual Valuation Engagements

Companies sold to financial

sponsors over the past five years

#### Fully Integrated Financial Sponsors Coverage

24 Senior officers dedicated to the sponsor community in the Americas and Europe 1,000+ Sponsors covered, providing market insights and knowledge of buyer behavior

#### Houlihan Lokey Is a Global Firm

Americas			Europe and	d Middle Eas	t	Asia-Pacifi	с	North
Atlanta	Houston	San Francisco	Amsterdam	Madrid	Stockholm	Beijing	Mumbai	Sydney
Baltimore	Los Angeles	São Paulo	Antwerp	Manchester	Tel Aviv	Fukuoka	Nagoya	Tokyo
Boston	Miami	Washington,	Dubai	Milan	Zurich	Gurugram	Shanghai	
Chicago	Minneapolis	D.C.	Frankfurt	Munich		Hong Kong	Singapore	
Dallas	New York		London	Paris		SAR		

(1) As of April 2023. Excludes corporate MDs. (2) As of May 2023. (3) LTM ended March 31, 2023.

## About Our Healthcare Industry Group

Behavioral

Oral Health



Houlihan Lokey's Healthcare Group has earned a reputation for providing superior service and achieving outstanding results in M&A advisory, capital raising, restructuring, and financial and valuation advisory services.

We provide in-depth knowledge, proven transaction experience, and an exceptional level of service to our clients.

Deals

37

36

32

24

22

22

2022 M&A Advisory Rankings-Global Healthcare Transactions

Under \$1 Billion

Houlihan Lokey

Rothschild

JP Morgan

Goldman Sachs

Lincoln International Source: Refinitiv

Excludes accounting firms and brokers.

Learn More About Our Healthcare **Industry Coverage** 

Jefferies

Lazard

Advisor



#### Industry Sector Coverage

**Key Facts and Figures** 

We cover a broad array of sectors, with bankers dedicated to each of our primary coverage areas





Global Healthcare

Technology



Global

Pharmaceuticals





Hospital/Outpatient Clinical and





86%

Transactions Closed

in or Above

Pitch Range

Managed Care/ Payors **Outsourced Services** 

**Outpatient Services** 





Distribution





Hospitals

Physician Practice Management

Housing

Post-Acute/Senior

Retail Healthcare

Global Medical **Technology Products** and Services

#### **Featured Healthcare Industry Transactions**

As received strategic growth investment from	© PARADISM a portfolio company of Infandem CATTAL PARTNERS has been acquired by a fund managed by Blackrock, Inc.	an operating company investment of PRITZKER has been acquired by NOVO holdings	has sold its subsidiary. Trustmark Health Benefice, to Health Care Service Corporation	APOLLO Accilo funds have partnered with and made a strategic investment in	a portfolio con bas merged w a portfolio con a portfolio con percention a portfolio con percention k K R 1
Sellside Advisor	Sellside Advisor	Selfside Advisor			
has acquired	STEPLING PARTNERS has merged with WEST DERMATOLOG B a portfolio company of	a portfolio company of Klantic Capital has been acquired by	a portfolio company of	a portfolio company of GENERAL © CATALYST has been acquired by	a portfolio o BREE has been ac
INTERNATIONAL OREMICAL INVESTORS	a portfolio company of SUN CAPITAL Selliside Advisor	CORNELL CAPITAL Sellside Advisor	Seliside Advisor	Webster Equity Partners Sellside Advisor	HCA Healthc





Payor and Employer Services

Pharmaceutical Services

## Houlihan Lokey's Global Medical Technology Team



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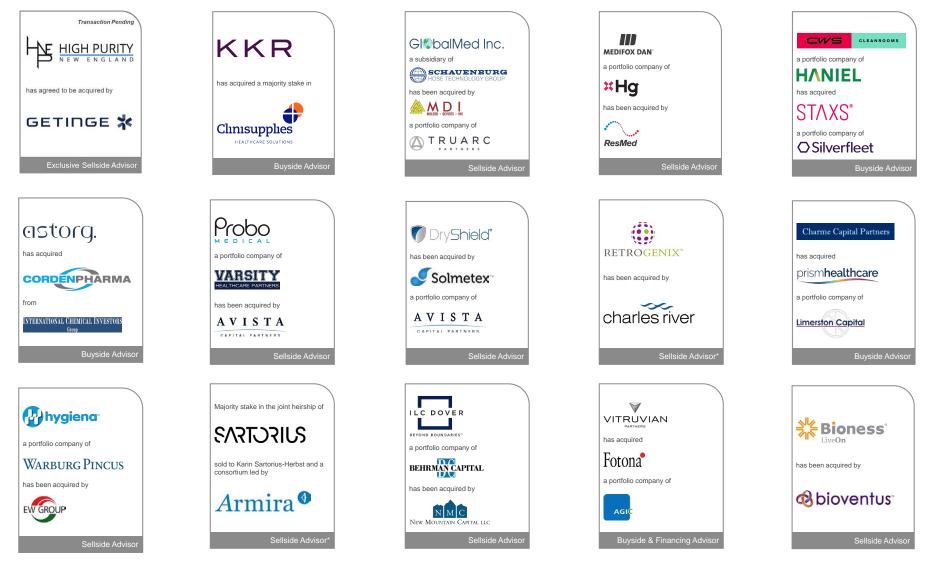


Lara Kurth Vice President Lara.Kurth@HL.com



# Houlihan Lokey's Healthcare Group Is a Leading Advisor to Healthcare Companies

...With Experience in Life Sciences Tools and Broad Capabilities Across MedTech



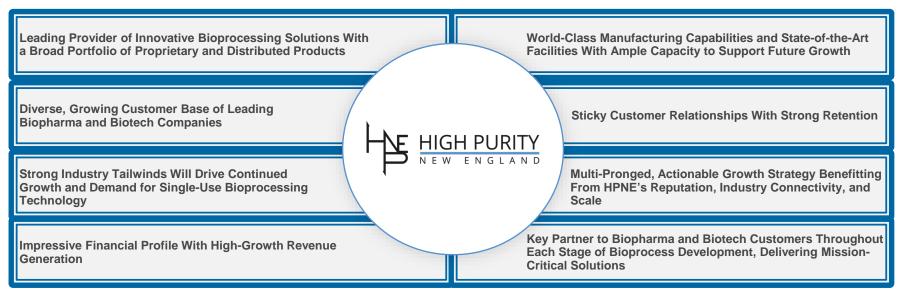
Tombstones included herein represent transactions closed from 2020 forward.

\*Selected transactions were executed by Houlihan Lokey professionals while at other firms acquired by Houlihan Lokey or by professionals from a Houlihan Lokey joint venture company.

## **High Purity New England: What the Market Valued**

#### Leading Single-Use Bioprocessing Platform

High Purity is a deeply experienced organization committed to advancing customers' bioprocessing objectives from discovery to commercial launch by supplying a diverse range of innovative products and solutions.





## Bioprocessing Outlook: Innovation Will Continue to Drive Growth in 2023 and Beyond

We are pleased to present our bioprocessing industry thought piece. If there is additional content you would find useful or if you are interested in discussing any of our perspectives further, please don't hesitate to reach out. We look forward to staying in touch with you.

#### **Bioprocessing Overview**

Growth in the broader pharmaceutical industry has been largely driven by the continued development and sophistication of biologics and the emergence of other next-generation therapeutics. Unlike traditional small molecule drugs (i.e., Tylenol), which are easily manufactured through chemical synthesis, biologics are extracted from living organisms, making their manufacturing highly complex, time-consuming, and costly. These drugs are produced using living cells in two distinct phases: upstream (manufacturing) and downstream (purification), collectively known as bioprocessing. While bioprocessing has a variety of end-market applications, including biofuels and food science, its role in the biopharma industry continues to grow in importance.

Bioprocessing is essential to producing biologic drugs, from established monoclonal antibodies to emerging cell and gene therapies (C&GTs). This industry has played a critical role in supporting the biopharmaceutical innovation engine as the portfolio of available therapeutic modalities continues to advance. There has been a rapid increase in R&D activity in biologics as well as increasing exploration of biosimilars, personalized medicines, and treatments for rare orphan diseases. The increasing complexity of available therapeutics and growing drug approvals will continue to drive demand for next-generation bioprocessing solutions as the industry looks for new ways to develop these therapies in less time and at lower costs. The pandemic further validated this trend as Pfizer's COVID-19 vaccine was the first mRNA product to achieve full FDA approval and made it to market in record time, demonstrating the value that efficient bioprocessing can add to the drug development process.

In recent years, there has been a material change in the complexity of bioprocessing as the portfolio of available drugs manufactured by the biopharma industry continues to advance. Biologics, for instance, accounted for greater than 40% of all drug sales in 2021 compared to only 25% a decade ago. This evolution has required accelerated investment in and continued exploration of new technologies in order to keep up with growing demand and increasingly complex manufacturing requirements. As a result, the highly specialized equipment and consumables that are essential to bioprocessing have become a high-growth area of opportunity as the premium for innovative solutions continues to increase. Bioprocessing demand is strongly correlated to the underlying biopharma market; therefore, future growth within bioprocessing is expected to be at least in line with the growth of biologics but likely higher as the industry continues to find new ways to innovate and add value.



#### Sources: Evaluate Pharma, Wall Street equity research, public domain.

#### Houlihan Lokey's Outlook

By nature of its function, the bioprocessing industry is constantly evolving, creating a fertile environment for innovation opportunities. The technology, equipment, and operations need to adapt to new therapeutic modalities, more cost- or energy-efficient solutions, variable batch sizes, and increasing levels of demand. The expansion of biosimilars, increased focus on reducing drug costs, and (more recently) a global pandemic have all driven transformative industry changes, including the increased adoption of single-use systems. Traditionally, stainless steel equipment has been used in commercial drug production. However, given their scalability, cleanliness, and cost savings, the industry has gradually transitioned to single-use solutions. Single-use systems innately offer more flexibility in the drug production process, helping to accelerate time to market with less capital investment and allow for smaller batch sizes for lower-volume, specialized therapeutics. Continuous manufacturing, automation, process analytical tools, and alternative downstream processing techniques are all additional near-term focus areas ripe for innovation that will be additive to the growing market opportunity in bioprocessing.

Global Bioprocessing Technology Market (\$ in billions)



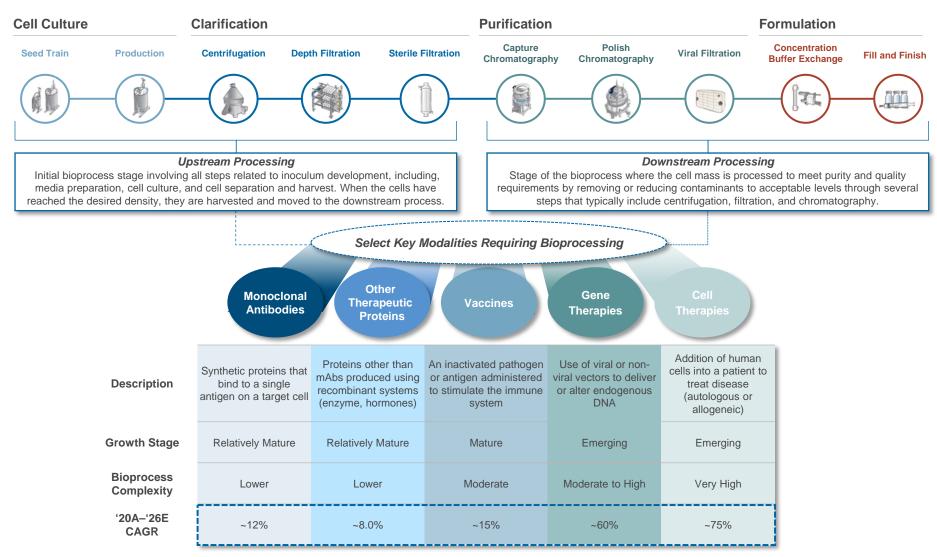
The bioprocessing ecosystem comprises input providers, including cell culture media and cell lines, as well as tools and equipment manufacturers and service providers. Established players such as Merck, Danaher, Sartorius, and Thermo Fisher have a large footprint in the market, but there is still ample opportunity for smaller, innovative players to gain share. As bioprocessing continues to become more complex and the cost of manufacturing continues to rise, an opportunity has emerged for smaller, niche players to specialize in supplying critical inputs and equipment that add value to the workflow. M&A activity has increased across the sector, with larger players putting cash to work to acquire these innovative, platform-enhancing assets. With the industry now more consolidated, M&A will continue to be active but will likely be more focused on diversification and technology-enhancing assets.

We continue to view the bioprocessing space as a highly attractive area for investment within healthcare, especially for investors looking for exposure to enticing trends within the growing biopharma space without taking on drug-specific risk. Positive industry tailwinds should continue to support robust growth, including growing approvals within C&GT, biosimilar volume growth, increased reliance on single-use systems, and the emergence of increasingly complex therapeutic modalities. While customer overstocking from the pandemic may be a headwind to growth in the short term, we continue to have confidence in the fundamentals and long-term potential of the industry.

## A New Era of Pharmaceutical Development: Bioprocessing Workflow and Relevant Modalities

#### **Overview of the Bioprocessing Workflow**

Represents a general overview of the bioprocessing workflow; single-use assemblies and equipment are utilized throughout the bioprocessing workflow



Sources: Evaluate Pharma, FDA, Pharmaprojects, World Health Organization, Wall Street equity research, public domain.

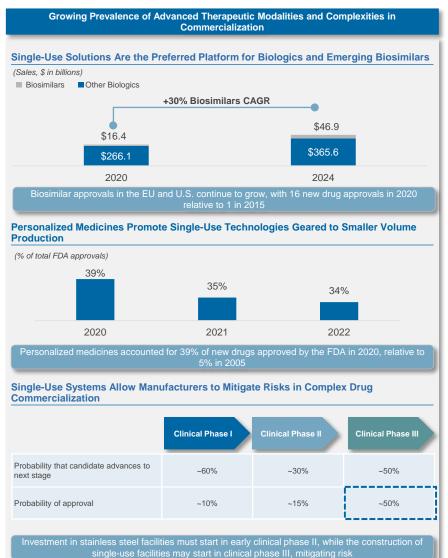
# Innovation in Bioprocessing Technology: What's Next in the Evolution?

As the biopharmaceutical landscape continues to evolve with the advent of newer, more complex therapeutic modalities, bioprocessing technology will continue to be pushed to new limits of innovation to accommodate this growing advancement while maintaining quality and controlling costs.

	<u>Technology</u>	<u>Benefits</u>
Continuous Manufacturing	<ul> <li>Continuous manufacturing is a process by which pharmaceutical products are produced from end to end on a single, uninterrupted production line.</li> <li>This technology offers greater flexibility and efficiency relative to traditional batch manufacturing, which requires transporting, testing, and refeeding materials from one process to the next.</li> </ul>	✓ Improved utilization, flexible batch sizes, lower energy consumption, and accelerated time to market.
Process Analytical Technology	<ul> <li>System and tools used for designing, analyzing, and controlling manufacturing through timely measurements of critical quality and performance attributes within the bioprocessing workflow to ensure final product quality.</li> <li>Currently, typically done offline in a quality control lab with a goal of advancing to real-time monitoring.</li> </ul>	✓ Improve process robustness, accelerate scale-up to commercial production and drive more efficient use of resources.
Single-Use Systems	<ul> <li>Single-use technology generally refers to disposable components that are used in lieu of stainless steel equipment throughout the production process and offer well-documented cost, time, and flexibility benefits.</li> <li>Typically includes bioreactor or upstream uses but is also applicable to filtration systems, sensors, consumables, and other parts of the bioprocessing workflow.</li> </ul>	✓ Increased process flexibility, faster scale-up, reduced contamination, lower costs, capital investment, and energy requirements.
Downstream Processing 2.0	<ul> <li>Various technologies in the early stage of development designed to improve economies of scale for downstream processing.</li> <li>Examples include exploring alternatives to protein A chromatography, which is expensive and time-consuming, as well as membrane filtration, which can replace separation methods or centrifugation processes used in harvesting.</li> </ul>	✓ Increased output or product yield and lower costs and production timing.
Automation	<ul> <li>Automation in bioprocessing will come in many forms and have a variety of applications but will drive real-time, in-process monitoring and continuous control for upstream and downstream processes while reducing error and manual tasks and increasing efficiency.</li> <li>Process analytical technology is a critical enabler of automation because of the need to measure critical process parameters at all stages.</li> </ul>	<ul> <li>Drives the production of higher quality and more consistent drugs at lower costs with higher flexibility and faster time to market.</li> </ul>

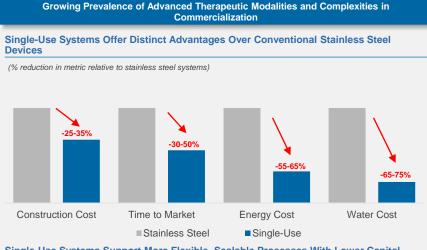
## Single-Use Technology Drives Flexibility and Value in Modern Bioprocessing

Durable industry trends and distinct advantages associated with the implementation of single-use technology in the biomanufacturing process will continue to drive increased adoption and outsized industry growth.



Single-use racinges may start in clinical phase m, miligating risk

Sources: Equity research, public sources, FDA, Evaluate Pharma, Personalized Medicine Coalition.



Single-Use Systems Support More Flexible, Scalable Processes With Lower Capital Investment

(Illustrative comparison of stainless steel to single-use facility)

	Multi-Use Facility	≮ ج م	Single-Use Facility	$\uparrow$
Capex Required	~\$500M to \$1B		~\$20M to \$100M	
Time to Construct	~5 to 10 years		~1 to 2 years	
Change Over Time	~4 weeks		~0.5 days	
Footprint	Footprint ~Greater than 70,000m <sup>2</sup>		~10,000m <sup>2</sup>	

✓ Increased Flexibility: Plastic and silicone tubing and filters can be modified more easily than stainless steel pipes

✓ Reduced Cleaning Requirements: Single-use equipment comes pre-sterilized while steel components need to be cleaned after every batch

✓ Decreased Footprint: Single-use technology requires less equipment to be stored on site

## **Bioprocessing Ecosystem Across the Value Chain**

Selected Assets in the Bioprocessing Value Chain

## Single-Use Assemblies, Consumables, and Components Bioreactors, Pumps, and Sensors Contact our team for additional information **Other Upstream Equipment** Houlihan Lokey Other Downstream Equipment Cleanrooms, Storage, and Services Process, Analytics, and Automation

Sources: Wall Street equity research, public domain.

Notes: Excluded large public companies. The industry players presented in this landscape are grouped according to key competency areas within the bioprocessing value chain; however, they might also have complementary/secondary capabilities in additional areas.

## **Select Precedent Bioprocessing Transactions**

### Summarized below are select recent bioprocessing transactions led by strategic buyers and financials sponsors. To learn more about key buyers and valuation drivers, please contact Houlihan Lokey's Medical Technology Team

Date	Acquirer	Target	Target Description
lay-23	GETINGE 🛠	HIGH PURITY	Leading provider of single-use solutions for bioprocessing applications
Apr-23	REPLIGEN	FLEXBIDSYS	Manufacturer of single-use bioprocessing products, including bags, bottles and tubing assemblies
Mar-23	S/NFCJF/3	Polyplus	Develops and produces transfection as well as other DNA/RNA delivery reagents and plasmid DNA
Feb-23	Biotage	Astrea	Chromatography solutions provider, including, resins, adsorbents and columns as well as nanofiber-based purification technologies
Jan-23	KKR / Astrea	Delta	Leading manufacturer of advanced chromatography columns
Jun-22		Barkey	Leading provider of controlled rate thawing devices to medical, biotech and pharma industries
May-22	DOVER	MALEMA	Developer of a single-use flow sensor, which leverages Coriolis technology to deliver superior flow-measurement performance and accuracy
Jun-22	Jonaldson.	Purilogics	Leverages a novel technology platform for the development of membrane chromatography products
Jan-22	maravai	MyChron	Provider of proprietary, ultra-pure nucleotides to customers in the diagnostics, pharma and research
Jan-22	<b>SANISURE</b>	GLENGINEERING	Leader in single-use filling needle design and manufacturing
Dec-21	REPLIGEN	BIOFLEX FOLCTIONS	High purity supplier of specialty molded single-use components and fittings
Nov-21	Donaldson.	SOLARIS.	Designer and manufacturer of bioprocessing equipment, including bioreactors and TFF systems
Sep-21	REPLIGEN	∧ŸITIDE	Developer of a molecule-specific affinity purification technology designed to improve drug safety
Oct-21	ECOLAB	🜔 Purolite	Global provider of high-end ion exchange resins for the separation and purification of solutions
Sep-21	(V avantor	Masterflex	Leading global manufacturer of peristaltic pumps and aseptic single-use fluid transfer technologies
Sep-21	SAINT-GOBAIN	<u>.</u>	Leading designer and provider of Flowmeters, produced for a broad range of applications
Jun-21	DOVER	q <u>uante</u> ×	Leader in single-use precision pump technology
Jul-21	SVIFCTFV3	& CellGenix	Produces and markets cell culture components, such as growth factors, cytokines, and media
Jun-21	(D DANAHER	<b>PRECISION</b> NANOSYSTEMS	Leader in technologies and solutions for the development of genetic medicines
Jun-21	() DANAHER	Caldevron	Manufacturer of nucleic acids and proteins used to make gene and cell therapies
Jun-21	REPLIGEN	polymem	Specialized manufacturer of hollow fiber membrane products for the biomanufacturing sector
Apr-21	THE CARLYLE GROUP		Developer of life science biologics tools focused on solving problems for biologics and gene therapy
Mar-21	METTLER TOLEDO	PENDOTECH	Manufacturer and distributor of products with a primary focus on bioprocessing applications
Jan-21	S/JIFCTF/3	onovaser	Acquisition of the Novasep chromatography process equipment division
Oct-20	REPLIGEN	ART SVN	Manufacturer and provider of single-use solutions, including chromatography and filtration systems
Oct-20	REPLIGEN		Specialized equipment provider including, plastic fabrication, assembly and standard thermoplastic tanks
Oct-20	SUIFCTF/3	BIA	Developer and manufacturer of products for purification and analysis of large biomolecules
Jul-20	37	west	Manufacturer, distributor and integrator of single-use bioprocessing systems and components
Jun-20	REPLIGEN	Engineering of the second seco	Manufacturer of single-use silicone assemblies and components used in the biologic drug development
Mar-20	DOVER	em-tec	Leading designer and manufacturer of flow measurement devices
Jan-20	37	COLL	Vertically integrated thermoplastic manufacturer of high purity tubing, sanitary fittings and over-molded connections for biopharma production facilities
Jan-20	37	CELLON	Manufacturer of single-use products for bioprocessing, storage and transport of sterile solutions including sterile bottles, custom tubes and platinum-cured tubing
Dec-19	GETINGE	oppikon"	Leader in the development and supply of advanced bioreactor systems for the research and production of vaccines and antibodies
Dec-19	KKR /	Astrea	Leading provider of process chromatography solutions including columns, resins and nanofiber purification
Oct-19	SVIFCTFAB	DANAHER Life Sciences	Portfolio of life sciences assets, including the FortéBio business, which comprises protein analysis instruments, biosensors, and reagents
Oct-19	GTCR /	<b>antylia</b>	Leading global source of fluid handling, test & measurement, environmental and biosciences instrumentation and associated consumables
Apr-19	REPLIGEN		An analytics company with a market-leading portfolio of spectroscopy products used in bioproduction

## **Medical Technology Team Bios**



#### Keith Barry

Managing Director, Head of Medical Technology KBarry@HL.com

Mr. Barry is Head of Houlihan Lokey's Medical Technology practice. He has more than two decades of healthcare investment banking experience and has managed a wide variety of projects, from mergers and acquisitions to equity and debt capital raises for the broader medical technology sector, including diagnostics and life science tools. Mr. Barry is now based in San Francisco, with previous experience at Wells Fargo Securities, Citi, UBS, and Salomon Smith Barney in both New York and London.



#### Jon Guskind

Managing Director JGuskind@HL.com

Mr. Guskind is a Managing Director in Houlihan Lokey's Healthcare Group. He has more than a decade of healthcare investment banking experience and has managed a wide variety of projects, from mergers and acquisitions to equity and debt capital raises for the broader medical technology, diagnostics, and life science tools sectors. Mr. Guskind is based in New York, with previous experience in both London and Chicago. Prior to joining Houlihan Lokey, Mr. Guskind held roles at Morgan Stanley and BNP Paribas.



#### **Paul Tomasic**

Managing Director, Head of European Healthcare PTomasic@HL.com

Mr. Tomasic is Head of Houlihan Lokey's European Healthcare team. He has more than two decades of healthcare investment banking experience and has managed a wide variety of projects, from mergers and acquisitions to equity and debt capital raises for the broader healthcare sector, including work with medical technology, life sciences, and healthcare services companies. Mr. Tomasic is based in London, with previous experience in New York and Tokyo. Prior to joining Houlihan Lokey, he held various roles at RBC, Citi, UBS, L.E.K., and Arthur Andersen.



Rainer Hepberger

Managing Director Rainer.Hepberger@HL.com

Mr. Hepberger is a Managing Director in Houlihan Lokey's Healthcare Group. He has more than 15 years of industry experience, particularly in medical technology, healthcare distribution, outsourcing, and consumer health. During his career, Mr. Hepberger has advised on more than 50 M&A transactions across Benelux, DACH, the U.K., Scandinavia, Spain, and Israel. Prior to joining Houlihan Lokey, he held roles at William Blair, Raymond James, PwC, and MBT.



Daniel Fritz Managing Director Daniel.Fritz@HL.com

Mr. Fritz is a Managing Director in Houlihan Lokey's Healthcare Group. He is based in the firm's Zurich office. Previously, Mr. Fritz was a Managing Director at GCA Altium, which was acquired by Houlihan Lokey in 2021.

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