



Life Sciences. Consulting. Expertise.

Capabilities Overview





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Who is Lumleian and what makes us different?

Who is Lumleian?

- Lumleian is a life sciences consulting firm founded in 2011 and based in Boston, MA
- Lumleian's unique platform leverages clinical, regulatory, and commercial expertise, combined with cutting-edge data analytics capabilities
- Our network of scientific (Ph.D.'s and clinicians), legal, and economic experts are tailored to our clients needs
- Lumleian's clients include established pharmaceutical and biotechnology companies, life-sciences investors, and emerging growth companies
- Lumleian provides tailored consulting solutions and decision support in therapeutics, diagnostics, medical devices across therapeutic areas

What Makes Lumleian Different?

- Lumleian is a data-driven consultancy that is focused exclusively on the life sciences
 - By combining cutting-edge data analytics with industry experience, we are able to deliver highly tailored solutions across the gamut of therapeutic areas and technologies
- Based in Boston, we have strong ties to the best and brightest clinicians, researchers, and innovators
 - We construct engagement-specific teams, leveraging clinical/scientific expertise to enhance internal capabilities
 - Our approach is "Answer First" - from day one, Directors are as involved as the engagement teams
- Having worked with both "buy" side and "sell" side companies, we understand the key drivers for maximum value creation for each



What are Lumleian's core offerings?

1 Technology Differentiation

- Clinical and commercial research including:
 - Differentiation thesis creation at both portfolio and asset/tech levels across development stages (pre-clinical to commercial)
 - Primary research, i.e. KOL interviews and surveys, comprehensive secondary research
 - Real-time access to elite network of global stakeholders, e.g. clinicians, execs, payors, patients

3 Portfolio Optimization and Diligence

- Identification, validation, & prioritization of potential therapeutic targets
- Proprietary revenue forecasting under multiple scenarios and product and technology design attributes
- Valuation of pipeline assets based on target product profiles (TPP's), epidemiologic patient segmentation models, and competitive landscape dynamics

2 Competitive Intelligence

- Disease state overview and standard of care paradigm highlighting epidemiology, and current and emerging treatment mechanisms
- Validation of clinical pipelines with mechanism of action (MOA) profiles and highlight pipeline catalysts and technological breakthroughs
- Commercial landscape evaluating market size and growth, consensus forecasts, and promotional spend

4 Clinical Strategy

- Benchmarking of assets & clinical strategies with proprietary data mining analytics to increase the odds of clinical success and expedite regulatory review.
- Evaluation of clinical development strategies to streamline processes, improving time, cost, and probability of technical and regulatory success

5 Launch Execution/Commercialization

- Message development and testing, pricing/positioning strategy, advisory board management, sales force optimization



Who are Lumleian's clients?

	Large Life Science	Life Science Investors	Emerging Growth
Description:	<ul style="list-style-type: none"> • 3 of top 10 life science companies <ul style="list-style-type: none"> – Business development – Discovery: Internal, External – Clinical Development – Market Research 	<ul style="list-style-type: none"> • 3 blue-chip life sciences funds <ul style="list-style-type: none"> – 2 of top 3 based on assets under mgmt. • Long term stakeholders <ul style="list-style-type: none"> – Debt financing, Private equity 	<ul style="list-style-type: none"> • 10 publicly traded and 5 privately held <ul style="list-style-type: none"> – Senior management – Board of directors – Heads of Strategy, Commercial
Business Mix:	<ul style="list-style-type: none"> • 33% 	<ul style="list-style-type: none"> • 33% 	<ul style="list-style-type: none"> • 33%
Product Offering:	<ul style="list-style-type: none"> • Technology Differentiation, Due diligence, Competitive intelligence, Portfolio optimization, Clinical strategy, R&D benchmarking 	<ul style="list-style-type: none"> • Clinical and Commercial Due diligence, Forecasting, Market Research, Competitive Intelligence 	<ul style="list-style-type: none"> • Portfolio optimization, Corporate strategy, Business development, Launch execution, Forecasting
Technology Focus:	<ul style="list-style-type: none"> • 100% therapeutics 	<ul style="list-style-type: none"> • 33% therapeutics • 33% diagnostics • 33% medical devices 	<ul style="list-style-type: none"> • 33% therapeutics • 33% diagnostics • 33% medical devices
Therapeutic Focus:	<ul style="list-style-type: none"> • Oncology • Autoimmune • Infectious disease • CNS, including pain • Orphan 	<ul style="list-style-type: none"> • Metabolic disorders <ul style="list-style-type: none"> – Cardiovascular, Diabetes • Infectious disease • Capital equipment, Surgical devices • CNS, including pain 	<ul style="list-style-type: none"> • Oncology • Orphan diseases • Gene therapy • CNS, including pain • Metabolic disorders <ul style="list-style-type: none"> – Cardiovascular, Diabetes
Geographic Focus:	<ul style="list-style-type: none"> • USA - 60% • EU: 30% (includes EU5 and broader markets) • Asia: 10% (internal team fluencies in Chinese, Korean, Japanese) 		





What is unique about Lumleian's platform and capabilities?

Universe of Public Information

Scientific & Clinical:

- Clinical trials
- Conference presentations
- Gene ontology
- Industry pipeline databases
- NIH grants
- Scientific literature & citations

Academic Tech Transfer:

- Early stage technologies
- Intellectual property filings

Business Development:

- Business development transactions
- Venture capital investments

Regulatory:

- Advisory committee transcripts
- FDA and EMA filings

Financial:

- Company presentations
- Earnings announcements
- Equity research coverage
- Investor relations transcripts

Competitive Landscape:

- Disease profiles
- Industry publications
- Sales and Rx data
- Treatment algorithms

Data Mining, Analytics, and Market Research

- Leverage data mining technology to access novel data sources
- Standardize, collate, and link data sources
- Execute Lumleian's proprietary analytical models
- Recruit KOLs and primary research participants

Consulting Team

- Clinicians and Ph.D. scientists
- Focused by area of expertise
- Economists and statisticians

• **Lumleian Team:** Director, Consultant (MD/Ph.D.), Analyst

• **Expert Consultants (MD/Ph.D.):** Consultants with direct clinical and/or scientific experience



In what disease states and market segments has Lumleian recently worked? (1 of 2)

	Therapeutic		Medical Device		Diagnostic
	Discovery	Clinical	Capital Equipment	Disposable	
Autoimmune:	<ul style="list-style-type: none"> Regulatory T-Cell 	<ul style="list-style-type: none"> Rheumatoid Arthritis 			
Cardiovascular:		<ul style="list-style-type: none"> Hyperlipidemia Hypertension 	<ul style="list-style-type: none"> Vascular Imaging Robotic Systems <ul style="list-style-type: none"> – Arrhythmia – Intravascular 	<ul style="list-style-type: none"> AAA Stent Artherectomy 	
Dermatology & Aesthetics:		<ul style="list-style-type: none"> Acne (OTC) Teeth Whitening 	<ul style="list-style-type: none"> Energy & Laser Systems <ul style="list-style-type: none"> – Skin Tightening – Skin Resurfacing – Body Contouring 		
Gastroenterology:			<ul style="list-style-type: none"> Esophageal Imaging 	<ul style="list-style-type: none"> GERD Repair 	
Hematology & Oncology:	<ul style="list-style-type: none"> Immunotherapy <ul style="list-style-type: none"> – CAR-T Cell Therapy Gene Therapy 	<ul style="list-style-type: none"> Solid Tumor <ul style="list-style-type: none"> – Breast – Head & Neck – Melanoma – Ovarian – Prostate Hematology <ul style="list-style-type: none"> – MDS – AML – ALL 	<ul style="list-style-type: none"> Radiation Therapy Linear Accelerators 		<ul style="list-style-type: none"> Disease Panels <ul style="list-style-type: none"> – Hematology – Solid Tumor Disease Specific <ul style="list-style-type: none"> – Colorectal Cancer Platforms <ul style="list-style-type: none"> – Next Generation Sequencing – Digital PCR
Infectious Disease:	<ul style="list-style-type: none"> HPV Cancers 	<ul style="list-style-type: none"> HCV & HBV OTC Products <ul style="list-style-type: none"> – Allergies – Cold and Flu Vaccines <ul style="list-style-type: none"> – Delivery Platform 	<ul style="list-style-type: none"> H₂O₂ Vapor System 		<ul style="list-style-type: none"> HPV Cancers



In what disease states and market segments has Lumleian recently worked? (2 of 2)

	Therapeutic		Medical Device		Diagnostic
	Discovery	Clinical	Capital Equipment	Disposable	
Metabolic Disease:	<ul style="list-style-type: none"> • Mitochondrial Diseases 	<ul style="list-style-type: none"> • Type II Diabetes 		<ul style="list-style-type: none"> • Insulin Delivery <ul style="list-style-type: none"> - Type I Diabetes - Type II Diabetes 	
Neurology & Pain Management:		<ul style="list-style-type: none"> • Alzheimer's • Anesthesia • Headache <ul style="list-style-type: none"> - Cluster - Migraine • Pain Management <ul style="list-style-type: none"> - Acute (OTC) - Chronic - Fibromyalgia - Neuropathic 	<ul style="list-style-type: none"> • Neurostimulation <ul style="list-style-type: none"> - Headache <ul style="list-style-type: none"> • Cluster • Migraine - Pain Management <ul style="list-style-type: none"> • Chronic 		
Ophthalmology:	<ul style="list-style-type: none"> • Gene Therapy 		<ul style="list-style-type: none"> • Retinal Imaging 	<ul style="list-style-type: none"> • Contact Lenses 	
Radiology:			<ul style="list-style-type: none"> • Magnetic Resonance • Tele Radiology 	<ul style="list-style-type: none"> • Lymph Node Mapping 	
Orthopedics & Sports Medicine:				<ul style="list-style-type: none"> • Meniscus Repair 	
Surgery:			<ul style="list-style-type: none"> • Laser Technologies • Robotic Systems 		
Women's Health:		<ul style="list-style-type: none"> • Contraception • Osteoporosis 			<ul style="list-style-type: none"> • HPV Cancers <ul style="list-style-type: none"> - Cervical - Head & Neck • IVF Screening





What feedback do Lumleian's clients provide?

Ownership

"From day-one Lumleian owns the problem as much as we do. They find a way to solve it. In a word they are relentless."

"Lumleian is scrappier than everyone else. It is built into their DNA from the directors down to the analysts. For them it is not just a deliverable."

Expertise

"The bankers recommended Lumleian, so I hired you (Lumleian) to give us arms and legs. It was a big deal for us and tapped our internal scale, so we also hired regulatory consultants, clinical consultants, and pre-clinical ones. The target company was purposefully slow in providing information on their portfolio, so our internal BD team and everyone else was stuck. You guys dug us out and just re-created their portfolio (clinical and pre-clinical) from scratch and identified all the assets and flagged the risks - regulatory, pre-clinical, clinical. As you know, I just let the other consultants go - and retained just Lumleian..."

Quality

"Our investment committee now demands the orange diligence reports. They value the narrative, the analytical detail, and the scientific and clinical rigor."

"Lumleian is thorough. They don't leave a stone unturned. Lumleian's quality of work product sets the bar. It is second to none."

"We got in a room and compared deliverables across firms, and everyone kept coming back to Lumleian's deliverable - even those who had never worked with them... The write-ups are twice as valuable as slides."

Efficiency

"We bid it out to a few big firms with global reach and they all came in with the same offer - twice as much, twice as long, and half the work product. Lumleian delivered the entire diligence in four weeks and they surveyed 10 European countries in one month. We didn't think they would hit goal - but they did."

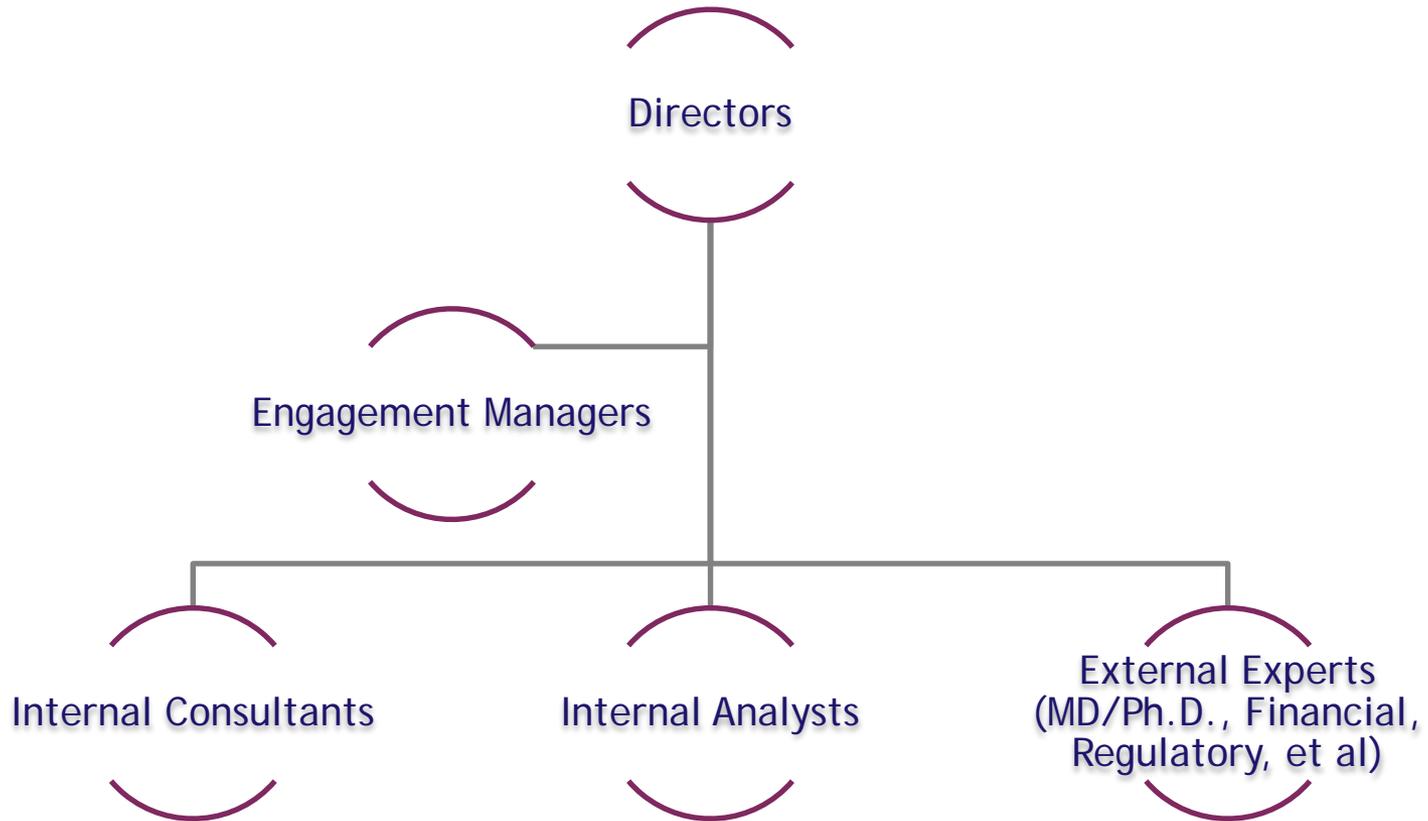
"Lumleian's proposals just stand out - they come in knowing the issues and staff real experts on their teams, so there is no down time. By the end of week one, I can put them in a room with a portfolio companies management team, and they can go toe-to-toe on the commercial and on the science."

"Their platform is so efficient and thorough, they get scale and pass these savings onto us."





How is Lumleian Organized?





Who are Lumleian's Directors?

Frank Deane, Ph.D., is a Director and Founder of Lumleian. Frank has over ten years of experience working with life science companies. Prior to founding Lumleian, Frank was a Director with Leerink Swann and a Case Team Leader with Bain and Company. Frank entered consulting after spending three years in the biopharmaceutical industry with Eli Lilly, supporting portfolio optimization and business unit strategic planning. Frank began his career as a quantitative risk analyst working at BlackRock. Frank earned a Ph.D. in econometrics from the Krannert School of Management at Purdue University, where his dissertation focused on applying game theory and statistical modeling to optimize pharmaceutical resource allocation. Frank has a Bachelor of Arts in economics from Princeton University. Frank is an Eagle Scout, inconsistent tennis player, mediocre skier, and father of three.

Jason Greenberg, Esq. is a Director and In House Counsel at Lumleian, and holds a professorship at the Boston College Carroll School of Management. Jason has nearly a decade of experience in the life science industry, working with large pharma and emerging biotech/med device companies. Jason has led consulting in early- and late-stage clinical development, commercialization, and strategy; portfolio optimization, clinical development benchmarking; clinical/commercial investment due diligence; and risk-analysis. Prior to joining Lumleian, Jason worked as a senior associate at Sassoon & Cymrot, LLP and Fried Frank, clerked at the U.S. Federal District Court in Boston, and as a Legislative Aide for Sen. John Warner (R-VA). Jason earned his EMBA from the Boston University Questrom School of Management, his J.D. from Suffolk University Law School and his B.A. in Political Science from the George Washington University.