

DefinedHealth

unconventional insight



Core Services

- ◆ Defined Health has three core lines of business, each focused on helping companies build and strengthen development-stage assets; compounds, portfolios and platforms
- ◆ A key differentiator is the firm's focus on defining value for early stage compounds as "proof of relevance" ("PoR"), looking beyond mechanistic proof-of-concept to demonstrate clear potential for clinical differentiation and indisputable commercial value
- ◆ Defined Health's position of trust can be leveraged for the long term, across the continuum of clinical development and "go to" market services

Opportunity Assessments

- Validate scientific rationale
- Position in evolving standard of care
- Define target patient populations, clinical endpoints and target product profiles
- Determine payer perspective
- Assess commercial value

Portfolio and Platform Strategy

- Analyze and prioritize pipeline portfolio
- Identify and assess novel indications for development
- Prioritize potential indications
- Define value inflection strategy for clinical candidates
- Advise on optimal time and stage of development for partnering
- Advise on partner selection

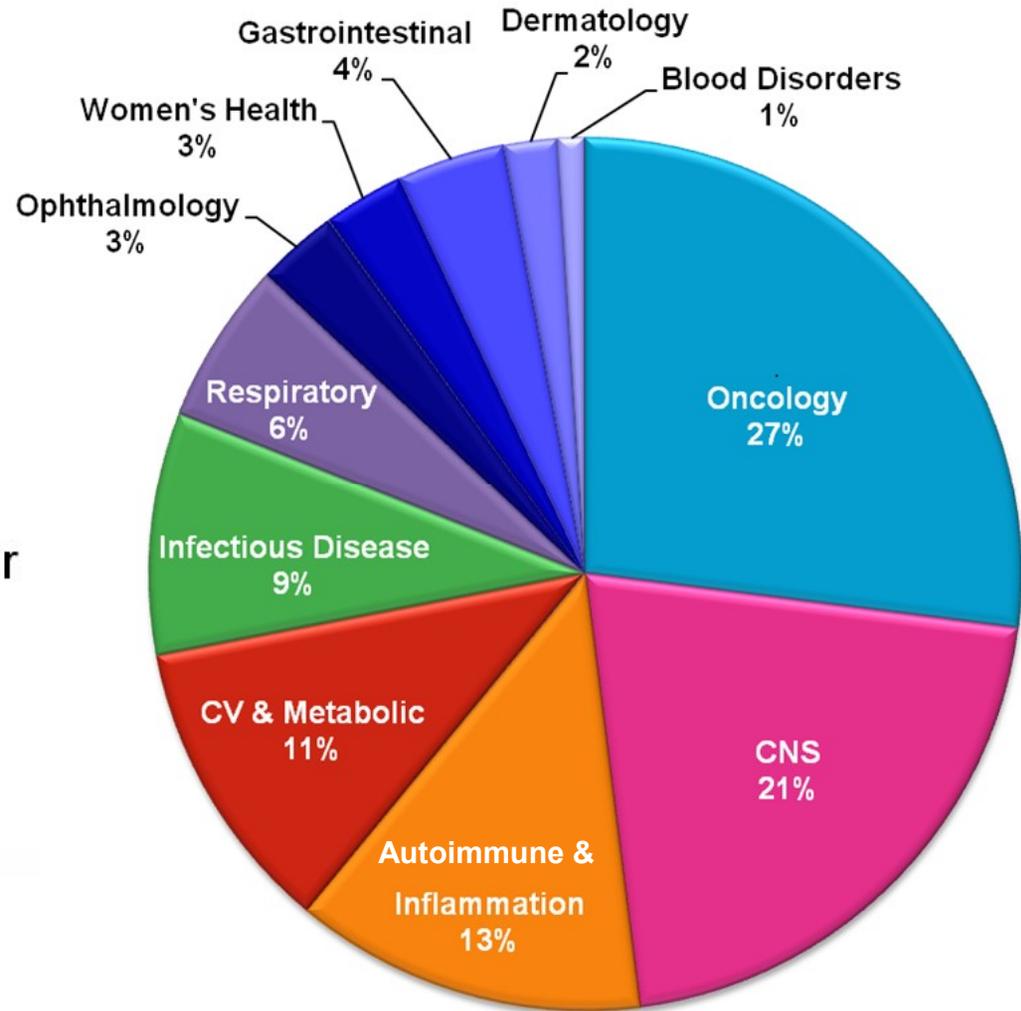
Identification and Evaluation of In-Licensing Opportunities

- Establish criteria for identifying programs that fit with strategy
- Identify assets and/or companies that best match criteria
- Provide deeper analysis of priority targets
- Identify value inflection points to optimize partnering strategy
- Leverage extensive industry network to identify potential strategic partners

Deep Knowledge Across Therapeutic Areas

Defined Health Recent Work by Therapeutic Area

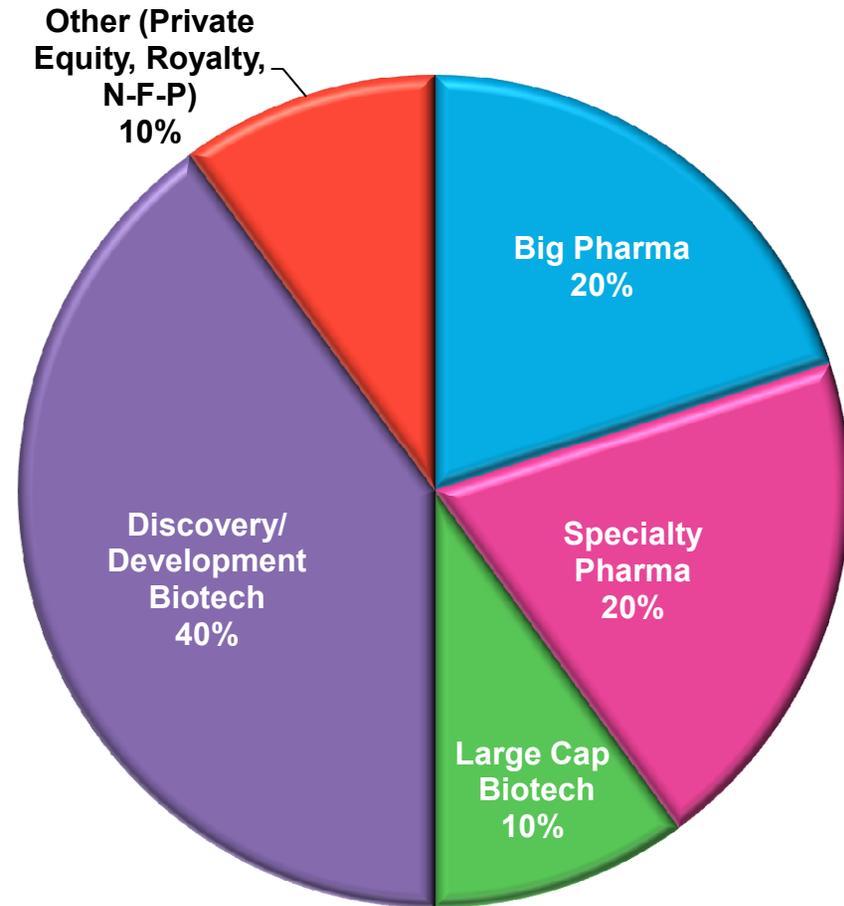
Defined Health has a deep knowledge base within and across various therapeutic categories. The focus of our work closely mirrors the therapeutic area focus of today's biopharmaceutical industry pipeline.



Based on 2 year prior MAT data in 2013

Diversified Client Base

- ◆ 50% of Defined Health's business is with discovery and development-stage and large cap biotech companies
- ◆ Defined Health is in constant touch with the in-licensing priorities of big pharma and big biotech, as well as specialty pharmacos:
 - Engaged by 10 of the top 20 pharmaceutical companies (by revenues)
 - Engaged by 5 of the top 10 biotechs (by market cap)
- ◆ The result is a broad, diversified client base, working with compounds that have the potential to require tens of millions of dollars of clinical development and market access support over the next several years
- ◆ 60% of Defined Health's clients are repeat clients and 50% of new clients receive external recommendations to hire Defined Health



Based on 2 year prior MAT data in 2013

Defined Health Consultant Team

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Members of the Defined Health consulting team have advanced scientific degrees and/or considerable industry experience and are skilled at operating at the interface of the science, clinic and commercial space. We regularly conduct primary research with key opinion leaders as well as generalist and specialist physicians, which continually feeds our already strong grasp of medical management at the ground level.

Our website (www.definedhealth.com) contains multiple presentations on various therapeutic area topics that showcase the way our firm & consultants analyze the important issues that our clients face on a daily basis.

Therapeutic Area Knowledge

Expertise & Experience

Selected Case Studies

Defined Health

Core Areas of Experience and Expertise

Infectious Disease Ophthalmology
Oncology Gastroenterology Respiratory Hepatology
Nephrology **CNS** Drug Delivery Therapeutic Vaccines
Cardio/Metabolics Rare Diseases
Dermatology **Autoimmune/Inflammatory**
Transplant **Addiction** Molecular and Genetic Diagnostics
Women's Health Platform Technologies Fibrosis
Drug Device Combinations Biomarkers
Gene and Cell Therapy

Therapeutic Oncology: Experience & Expertise

Oncology

- ◆ **ONCOLOGY** is one of Defined Health's leading areas of research. We have done hundreds of commercial assessments and forecasts of novel MOAs, as well as opportunity search projects, across all MOAs and tumors.
- ◆ The Oncology practice is led by Jeff Bockman, PhD, Vice President and Mike Rice, MBA, Senior Consultant.
- ◆ Select examples of recently evaluated clinical development agents include: pro-apoptosis agents (including inhibitors of bcl2), angiogenesis inhibitors, agents targeting metastases including c-met antagonists and src inhibitors, agents targeting the IGF pathway, cell cycle targeting agents, mTOR-AKT-PI3K inhibitors, HDAC and HSP90 inhibitors.
- ◆ In addition, Defined Health has looked extensively at next-generation cytotoxic agents, as well as reformulations, including drug delivery plays on taxanes, platinums, and topoisomerase inhibitors.
- ◆ Defined Health has also analyzed cutting edge approaches to the treatment of cancer such as oligonucleotide therapeutics (antisense, ribozyme, RNAi), gene therapy, and vaccines (both autologous and allogeneic, cell-based and antigen-based systems).

Therapeutic Oncology: Select Recent Case Studies

Oncology

- ◆ *Pharma Company:* Strategically identified licensing and acquisition targets in order to expand the company's US presence in oncology. Maintained ongoing arrangement to qualitatively evaluate specific opportunities the company was considering acting on, both from our recommendations and their own internal directives. M&A event transpired.
- ◆ *Leading Oncology Company:* Identified early stage licensing opportunities through a systematic scientific, clinical & commercial screen of all Phase I compounds worldwide. Various deals ensued.
- ◆ *Small Biotech Company:* Assessed value of several development-stage opportunities to supplement the client's existing portfolio, which included a Phase III immunotherapy asset, and provided guidance on the strategic issues of making such moves. Considered complexity of moving into new MOAs outside their comfort zone which led to re-thinking of near-term strategic objectives.
- ◆ *Large Biotech Company:* Prepared strategic position paper on a novel MOA that provided expert, outside insight into specific mechanism and opportunities within the space. Client acquired a biotech company in that therapeutic arena.
- ◆ *Major Pharma Company:* Developed qualitative and quantitative rationale regarding life cycle management of company's late stage asset, including identifying key new tumor types and niche market opportunities, especially in light of the highly competitive nature of this MOA space. Product has since launched.
- ◆ *Major Biotech Company:* Developed a series of forward-looking white papers on key paradigm changes that could affect oncology over the next decade.
- ◆ *Pharma Company:* Evaluated a novel, but long-studied MOA/target for a non-oncology-focused company looking to enter the space. Suggested key tumors and development path, compared asset to other marketed/development stage programs in the category, developed top-line forecast model, and provided broader context for challenges and risks in oncology drug development & commercialization. Action pending.
- ◆ *Financial Firm:* Evaluated marketed, blockbuster-potential product to gauge its further growth in the initial indication, and additional upside in clinical development stage indications. Provided a detail, multiple indication and multiple scenario, US and EU 10 year forecast model. Deal done (not public).

Central Nervous System: Experience & Expertise

Central Nervous System

- ◆ **CENTRAL NERVOUS SYSTEM (CNS)** Disorders is one of Defined Health's most active business practices with projects considering neurological, psychiatric and pain indications.
- ◆ The CNS practice is led by Ginger Johnson, PhD, Vice President.
- ◆ As CNS mechanisms have potential across various neurological, psychological and even pain indications, we are often asked to assess CNS opportunities at the earliest clinical stages. We have worked with multiple companies to define a clinical development / opportunity sequencing strategies to maximize the value of a CNS asset.
- ◆ CNS specialty markets (e.g., neurologists, psychiatrists, pain specialists) are an area of focus for many of our clients and, are therefore, spaces in which we actively identify and recommend partnering opportunities.
- ◆ Specific CNS diseases in which Defined Health has amassed a substantial knowledge base include, but are not limited to:
 - Alzheimer's Disease
 - Parkinson's Disease
 - Multiple Sclerosis
 - Epilepsy
 - Addiction Disorders
 - ADHD
 - Depression
 - Anxiety
 - Schizophrenia
 - Insomnia/Sleep Disorders
 - Migraine
 - Inflammatory/Nociceptive Pain
 - Neuropathic Pain
 - CNS Orphan Diseases (e.g., ALS, Huntington's)

Central Nervous System: Select Recent Case Studies

Central Nervous System

- ◆ *Pharma Company*: Assessed early-stage, novel mechanism agents to complement their neurology pipeline, specifically focused on neurodegenerative disorders including Alzheimer's disease, Parkinson's disease and multiple sclerosis, as well as orphan indications. Worked with the company's scientific and business development team to prioritize and further evaluate attractive opportunities. Several of the identified opportunities are being considered for partnering.
- ◆ *Specialty Pharma Company*: Valued and prioritized a defined group of potential in-licensing candidates all focused on the treatment of acute pain, including migraine and post-operative pain.
- ◆ *European Pharma Company*: Developed clinical development strategy for a novel mechanism across various neuropathic pain types. Evaluated the potential of the agent to address the needs of specific patient subsets, clinical/regulatory risk and commercial positioning and value compared to future standard of care.
- ◆ *Pharma Company*: Evaluated the future market potential for an early-stage, repurposed agent targeting multiple subsets of anxiety and depression disorders as either a monotherapy or adjunct to standard of care.
- ◆ *Major Pharma Company*: Evaluated and prioritized indications for an early CNS-acting compound across multiple indications including Alzheimer's disease/mild cognitive impairment, schizophrenia-related cognitive disorder and Parkinson's related cognitive disorder.
- ◆ *Financial Firm*: Strategically assessed the potential growth of a marketed product within the neuropathic pain and fibromyalgia markets, taking into particular consideration the impact of current pipeline agents.
- ◆ *European Pharma Company*: Worked with management team to prioritize options for execution on the company's strategic plan to establish a commercial presence in the US market, ranging from acquisition of a company with existing commercial infrastructure to acquisition of a marketed product and organic build of sales force.
- ◆ *Drug Delivery Company*: Assessed and prioritized potential opportunities for delivery of various CNS therapeutics utilizing the company's proprietary technology.

Inflammation & Autoimmune: Experience & Expertise

Inflammation & Autoimmune

- ◆ **AUTOIMMUNE and INFLAMMATORY DISEASE** is another active area of research for Defined Health. Our experience in this indication touches on all three of our main business activities and includes performing opportunity assessments of specific products, identifying licensing and acquisition opportunities in search projects, and strategic projects focused on prioritizing lead and follow-on indications for products with broad mechanisms that are applicable to multiple indications across physician specialties.
- ◆ The AIID franchise is led by Defined Health Vice President, Aileen Nicoletti, PhD.
- ◆ Defined Health has developed a strategic framework for evaluating novel compounds and mechanisms in the AIID space based on scientific, clinical, and commercial attributes that are carefully refined based on the strategic goals and risk tolerance of our clients. Many of our projects in this area focus on utilizing this approach to prioritize indications for clinical development.
- ◆ Recent target indications include Rheumatoid Arthritis, Multiple Sclerosis, Systemic Lupus, Lupus Nephritis, Psoriasis, Ankylosing Spondylitis, Sjogren's Syndrome, Myasthenia Gravis, and many others.

Cardiovascular Disease: Experience and Expertise

Cardiovascular

- ◆ **CARDIOVASCULAR DISEASE** has historically been one of Defined Health's largest areas of business.
- ◆ The CV franchise is led by Michael Rice, MS/MBA, and Ed Saltzman, President.
- ◆ Defined Health has provided independent assessments and strategic advice for hundreds of development-stage cardioprevention, acute care and regenerative therapies, as well as interventional devices, for clients across the industry.
- ◆ Specific CV diseases in which Defined Health has amassed a substantial knowledge base include:
 - Dyslipidemia
 - Atherosclerosis / CAD
 - Genetically defined lipid disorders
 - LDLc Apheresis
 - Heart Failure
 - Dysrhythmia/A-Fib
 - ACS / Myocardial Infarction
 - Hypertension
 - Regenerative Medicine
 - Peripheral Vascular Disease
 - Thrombosis and Restenosis
 - Reperfusion Injury
 - CV related Metabolic Disorders
- ◆ Defined Health is the selected advisor to Informa Healthcare, the publishers and The Pink Sheet and In Vivo, to nominate the *Top Cardiometabolics Projects to Watch* presented annually at the Therapeutic Area Partnerships conference.

Cardiovascular Disease: Select Recent Case Studies

Cardiovascular

- ◆ Franchise Strategy: Cardiovascular landscape assessment and strategy for Big Pharmacos considering re-entering the CV space.
- ◆ Evaluation, market positioning and valuation of a novel HDL raising therapy in high risk patient segments.
- ◆ Landscape and therapeutic approaches for genetically defined CV disorders such as: HoFH/HeFH, ABCA1/Tangiers, LCAT, ACAT and ApoA1 deficiency, Cardiomyopathy.
- ◆ Strategic advice for potential expansion of a pharmaceutical grade omega-3 fatty acid to other indications and therapeutic areas.
- ◆ In-licensing opportunity assessment of an oral anti-arrhythmic for the maintenance of normal sinus rhythm in patients with chronic atrial fibrillation. Epidemiology, segmentation, treatment algorithm among primary care and cardiology specialists and competitive assessment.
- ◆ Therapeutic overview of acute cardioversion and antiarrhythmic use in atrial fibrillation for a client evaluating opportunities in this non-core business space.
- ◆ EU clinical plan and commercial launch strategy for an acute antihypertensive used in perioperative and emergent hypertensive crisis.
- ◆ In-licensing opportunity assessment of an IV thrombolytic agent in stroke, PAOD and early use in acute STEMI pts.
- ◆ AMI overview and out-licensing opportunity assessment of novel biodegradable polymer delivered via intracoronary injection. Aided client in commercial positioning and exploring partnering options.
- ◆ Strategically prioritization of potential indications for a dual acting receptor antagonist in PAH, diabetic nephropathy, CHF and resistant hypertension.
- ◆ Evaluation of several products for atrial fibrillation. Products are unique but share similar MOA.
- ◆ Developed a vision for a unique emergent / urgent care franchise to drive an acute care franchise strategy.
- ◆ Ex-US specialty company evaluating US market entry for an extended release agent in direct competition by a large pharma in the process of market development.

Metabolic Disease: Experience and Expertise

Metabolic

- ◆ **METABOLIC DISEASES** is likewise one of Defined Health's large practice areas. The metabolic franchise is led by Michael C. Rice, MS, MBA and Ed Saltzman, President.
- ◆ Our experience in this area encompasses opportunity assessments, market evaluation and positioning, clinical development strategy, and indication prioritization for biotech companies, and disease area strategy and opportunity assessments for in-licensing or acquisition for large and specialty pharmaceutical companies.
- ◆ We have performed hundreds of opportunity assessments of products for diabetes, dyslipidemia, metabolic syndrome and obesity, as well as providing high-level strategic advice to companies wishing to enter/navigate the increasingly challenging regulatory and commercial environment associated with these large markets.
- ◆ Other recent areas of focus for Defined Health have been CKD, NASH, sarcopenia and the broader frailty space – large, evolving markets with significant unrealized potential. Defined Health also has recent experience in endocrine tumors and has conducted broad, endocrinology opportunity search projects.
- ◆ Specific metabolic targets in which Defined Health has amassed substantial knowledge include: GLP-1 mimetics, SGLT2 inhibitors, DPPIV inhibitors, anti inflammatory targets for diabetes/obesity, non PPAR insulin sensitizers, MeTAP2 inhibitor, GPR40 agonist, PCSK9 antibodies, APOB inhibitor, HDL mimetics, and MTP inhibitors.

Infectious Disease: Experience & Expertise

Infectious Disease

- ◆ Historically, DH has done extensive work on antivirals across the entire spectrum of acute and chronic disease, with most emphasis on HCV/HBV and HIV. Work on novel antibiotics and antifungals is increasing significantly.
- ◆ Clients have asked Defined Health to advise them on a diverse selection of questions for antibiotics example: Is surgical C? For antivirals, assessments have included work on immune-modifying agents, biologicals, small molecules, and vaccines for HCV, HBV, HIV, HPV, VZV, CMV, RSV and influenza.
- ◆ Our expertise covers all classes of antibiotics from aminoglycosides through quinolones, to macrolides and streptogramins, and a broad range of potential indications:
 - Community and Hospital acquired pneumonia
 - Osteomyelitis and joint infections
 - Orphan indications like cystic fibrosis
 - Surgical prophylaxis
 - Healthcare acquired infections
 - Multi-drug resistant pathogens
 - Biofilms

Infectious Disease: Select Recent Case Studies

Infectious Disease

- ◆ In-licensing opportunity assessment of a variety of Gram positive agents, including epidemiology, segmentation, treatment algorithms for community and hospital acquired infections and full competitive assessments.
- ◆ Portfolio assessment and potential for optimal positioning for overlapping products within a company's portfolio.
- ◆ Evaluation of surgical prophylaxis for a number of procedures with varying risks of infection, including physician, surgeon and payer research to fully understand the drivers required to change surgeon's current practice in favor of a targeted spectrum antibiotic.
- ◆ Full evaluation including epidemiology, segmentation, treatment algorithms of a community antibiotic to support the client's discussion with potential partners and financiers.
- ◆ Evaluation of HPV vaccines for a financial firm – assessment of clinical and commercial challenges and drivers, and forecast model creation.
- ◆ Valuation of next generation protease inhibitors for HIV for financial firm, including assessment of trends for PI versus NNRTI first line regimens, impact of integrase inhibitor, etc.
- ◆ Assessment of novel agent for RSV for drug delivery company looking to enable the better efficacy of the molecule with its platform technology.
- ◆ Assisted a major multinational pharma company with an extent HIV franchise in strategically identifying novel targets for treatment of HIV and the future of HIV therapy more generally.
- ◆ Provided a major private equity bank with DH's objective and informed assessment of a development stage asset for HIV as part of the bank's investment decision, delivering both a qualitative evaluation and quantitative valuation of this next generation anti-HIV agent. Investment made and then company acquired by another bio-pharma company.
- ◆ Helped a major pharma company with its analysis of the future opportunities for IFNs in infectious disease.
- ◆ Assisted a major pharma company with a qualitative review of preventive and therapeutic vaccines for infectious disease (HCV, HBV, HPV, HIV).

Respiratory Disease: Experience & Expertise

Respiratory Disease

- ◆ **RESPIRATORY DISEASE** is an active area of research for Defined Health, and includes extensive assessments in both the Allergist and Pulmonologist side of these disorders (as well as their overlap into the PCP space).
- ◆ Defined Health has recently conducted a very large review of the COPD current and future management landscape, including a very granular analysis of novel MOAs.
- ◆ Defined Health has conducted numerous commercial evaluations of novel MOAs such as FLAP and CRTH2 inhibitors, interleukin antagonists, and historically did many analyses around leukotriene modifiers and PDE-IV inhibitors.
- ◆ Because of Defined Health's extensive client base of drug delivery companies, we have extensive experience looking at novel inhalation and intranasal platforms, both for next generation agents, novel agents, as well as lower risk branded generics, for asthma, allergic rhinitis, and COPD.
- ◆ Finally, Defined Health has conducted assessments of smaller, niche and orphan settings such as Idiopathic Pulmonary Fibrosis (IPF) and Cystic Fibrosis (CF).

Other Areas of Experience and Expertise

Nephrology

- ◆ Assessment of novel metallomatrix pathway-targeting agent for diabetic neuropathy
- ◆ Evaluation and forecasting of drug delivery play on erythropoietin
- ◆ Assessment of novel MOA for ESRD
- ◆ Opportunity search for development products within the renal space

Transplant Rejection

- ◆ Evaluation and forecasting of next generation calcineurin inhibitors with improved tolerability proposition
- ◆ Evaluation of novel, tolerizing biologicals for transplant and other immune settings
- ◆ Evaluation of targeted anti-lymphocyte cell surface-targeting monoclonal for SCT and SOT

Urology

- ◆ Scientific and commercial assessment of a novel biologic therapy for superficial bladder cancer
- ◆ Development of an in-licensing/acquisition strategy for a nascent urology franchise
- ◆ Critical evaluation of clinical development and market positioning strategies for a first-in-class therapy (benign prostatic hyperplasia and hypogonadism)

Women's Health

- ◆ Assessment of future market for female sexual dysfunction, including forecast for several pipeline agents
- ◆ Evaluation of novel MOA for the treatment of vasomotor symptoms
- ◆ Detailed evaluation of urinary incontinence/overactive bladder market and revenue potential for a niche market opportunity

Other Areas of Experience and Expertise

Ophthalmology

- ◆ Assessment, partner identification, and sales force estimates for cell based therapy for corneal surface disorders
- ◆ Evaluation and forecast of next generation anti-VEGF therapies for wet AMD (several projects)
- ◆ Market landscape and pipeline evaluations for major ophthalmology segments of glaucoma, retinal disease, and dry eye

Dermatology

- ◆ Evaluation & forecast of next generation cosmetic fillers and botulinum toxin products
- ◆ Evaluation & forecast for topical products aimed at treating actinic keratoses and cutaneous warts
- ◆ Search projects aimed at identifying potential “corner property” acquisitions for dermatology including evaluation of typical products for acne, psoriasis, and other common dermatology indications

Orphan Diseases

- ◆ Market assessments for expanded indications of marketed injectable product for spasticity, and other orphan indications
- ◆ Detailed competitive analysis & recommendations for next generation approaches in blood diseases such as hemophilia, ITP, & myelodysplastic syndromes
- ◆ Opportunity searches for potential in-licensing and acquisition targets for orphan metabolic diseases, cystic fibrosis, and pulmonary hypertension

Gastroenterology

- ◆ Evaluation and forecasting of products for post-operative ileus, inflammatory bowel disease (biologicals/small molecules), and ‘topical’ steroids
- ◆ Analysis of the pancreatic enzyme market and recommendation of a competitive positioning
- ◆ Assisted a biotechnology company with identification and prioritization of potential in-licensing opportunities focused on indications in the GI specialty setting

How Can Defined Health Work With Your Team?

- ◆ We are flexible with respect to project structure and timelines; all of our projects are done on a single client, custom and confidential basis.
- ◆ We have broad and deep knowledge across and within therapeutic and disease areas and ample infrastructure in place to start work on a given project quickly – we’re a good resource when time sensitive in-licensing opportunities are in play.
- ◆ We work either on a fixed cost or a per-diem (hourly) basis depending on client needs.
- ◆ We scope out projects based on client needs. We can perform a full opportunity assessment with a detailed patient-based 10-year forecast using analogs for ramp up, or conduct a portion of it (market research/secondary research/scientific diligence/KOL primary interviews/web based surveys, etc.), thus complementing in house expertise and resources on an a la carte basis. Here are some areas where we are often engaged by new product planning/emerging brand/business development teams:
 - Quick turn around primary market research.
 - Turn-key opportunity assessments including or excluding top-line, peak year or detailed patient based/scrip based market forecasts.
 - “Primer” sessions to bring the team up to speed in a new area.
 - Search and evaluation of strategically-valuable partnering candidates in any therapeutic or disease area of interest; product, technology or company focused; marketed and/or pipeline compounds; with global reach, using flexible screens depending on client needs.

Defined Health is pleased to present:



Defined Health will also be participating in the following industry events:

Rational Combinations 360° | June 23 - 24, 2016 | New York, NY | <http://dfndhlth.com/RC-360>
Pharma CI USA Conference | September 13 - 14, 2016 Parsippany, NJ | <http://dfndhlth.com/PharmaCIUSA>
The International Cancer Immunotherapy Conference | September 25 - 28, 2016 New York City | <http://dfndhlth.com/ICIC-2016>
LES Annual Conference | October 23 - 26, 2016 Vancouver, BC | <http://dfndhlth.com/LES-2016>
Bio-Europe | November 7 - 9, 2016 Cologne, Germany | <http://dfndhlth.com/Bio-Europe2016>
SITC 2016 | November 9 - 13, 2016 National Harbor, MD | <http://dfndhlth.com/SITC-2016>
ASH Annual Meeting | December 3 - 6, 2016 San Diego, CA | <http://dfndhlth.com/ASH-2016>
Cancer Progress by Defined Health | March 7 - 8, 2017 | New York, NY | <http://www.cancerprogressbydh.com>
Therapeutic Insight by Defined Health | March 20 - 22, 2017 | Barcelona, Spain | <http://www.therapeuticinsight.com>