

FANNIN

— INNOVATION STUDIO —

Houston's early-stage life science commercialization platform

Foundations of Cancer Therapeutics

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August 25, 2021

Learning Objectives

- Challenges and development models for successfully advancing academic inventions outside the major biotech clusters.
- Unique elements to Fannin's approach to drug development / commercialization and people development.

Texas Medical Center – City of Medicine



CONFIDENTIAL

Powerful Research and Clinical Engine



59 Institutions
106,000+ Employees
5,700 Researchers
88 National Academy Members

Over \$1B per Year in Basic Research

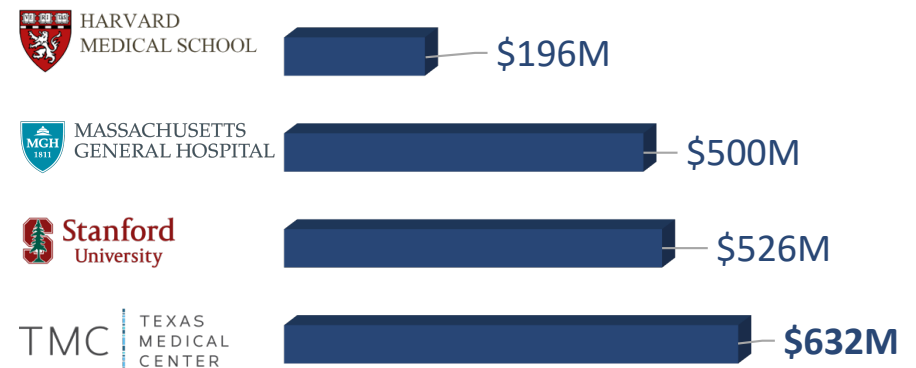
2,208 Active Grants
4,000 Active Clinical Trials

10M

Patient Encounters Each Year



2019 NIH Research Funding



NIH Funding Critical to Pharma/Biotech

Analysis of NME Approvals 2010-2016 *

	Approvals	NIH Contribution **
NMEs	201	198 (98%)
Targets	151	151 (100%)

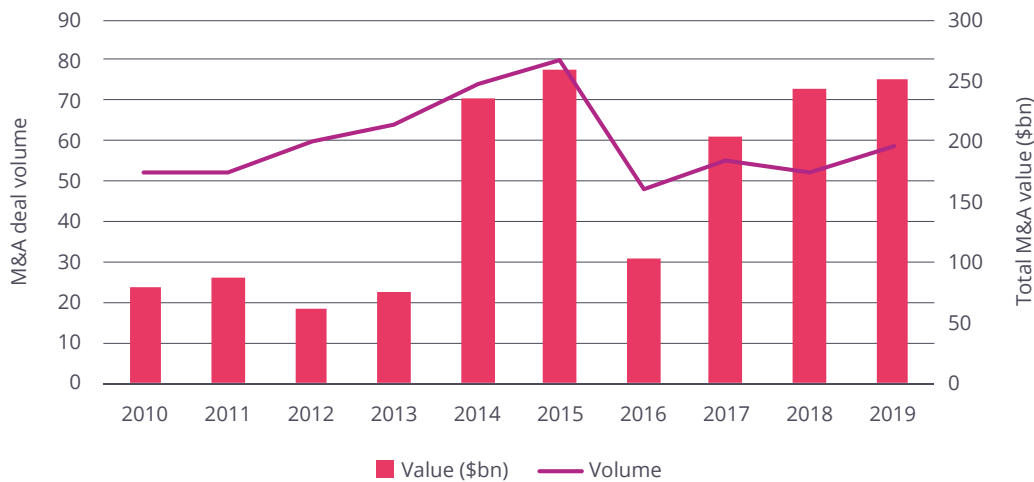
* Cleary *et al.* Proc Natl Acad Sciences, 2018. Eprint
February 12, 2018

** \$115.3 billion in inflation-adjusted spending estimates

Strong M&A and Investment Activity

Pharma M&A Deals 2010 - 2019

Figure 1: Major biopharmaceutical industry M&A deals during 2010-19

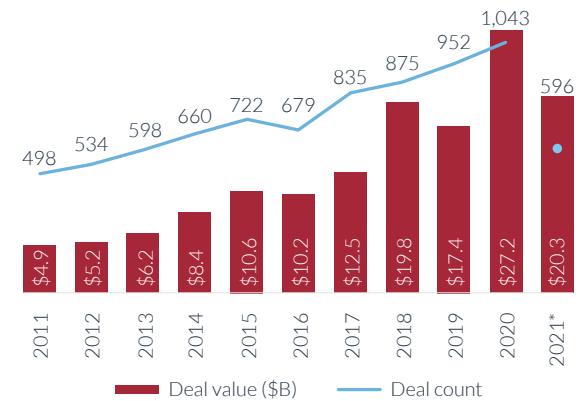


Source: Biomedtracker®, February 2020

Biotech & Pharma VC Deals 2011 - 1H2021

H1 biotech companies raise more than \$20 billion

US VC biotech & pharma deal activity



PitchBook-NVCA Venture Monitor
*As of June 30, 2021

Houston Lags in Biotech Funding and Reputation

Genetic Engineering & Biotechnology News

March 2021

Investments (\$M)

4Q2020 – 1Q2021

Total U.S.	\$30,700
Houston	\$500 (1.6%)

Top US Biopharma Clusters

1. Boston/Cambridge
2. SF Bay Area
3. NY/NJ
4. Maryland/DC
5. San Diego
6. L.A./Orange County
7. Philadelphia
8. Seattle
9. Raleigh-Durham
10. Chicago

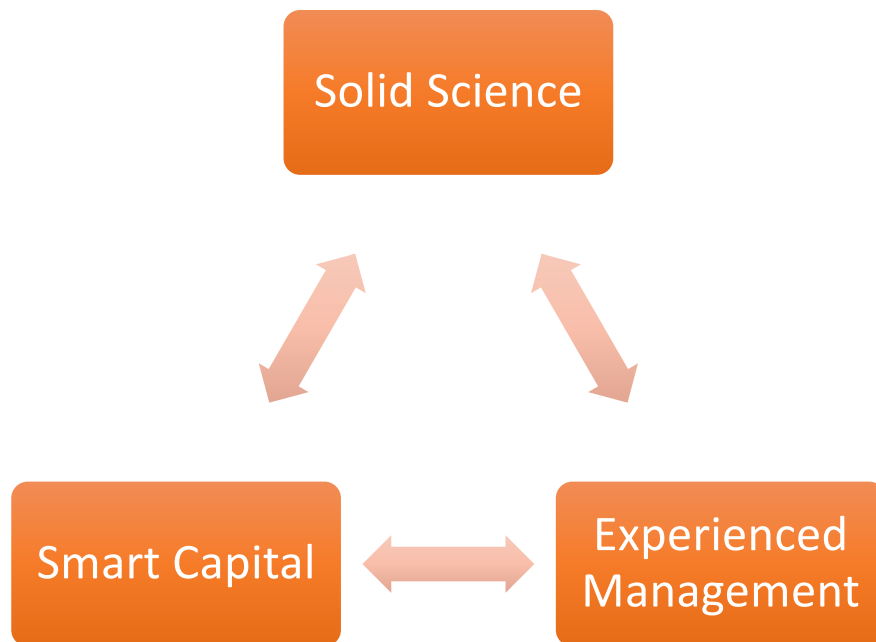
Data source: U.S.: Pitchbook/NVCA VC-backed biopharma, pharmaceutical/biotech only; no devices or diagnostics
Houston: Greater Houston Partnership all Healthcare related investments

Why the Commercialization Gap?

Requirements

Biotech Clusters

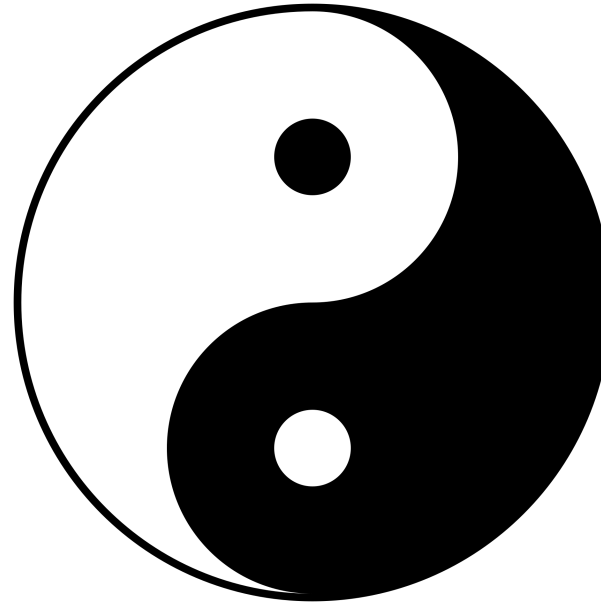
Academic Clusters



Need Both Scientific and Commercial Founder

Scientific Founder

- Deep domain expertise
- Scientific rigor
- Relationships
- But potentially non-commercial priorities and approach



Commercial Founder

- Development and fund-raising experience
- Focus on commercially relevant de-risking
- Credibility with pharma and Investors
- Relationships

Orthogonal Skill Sets and Capabilities

Are Zombies Running Amok?

*nearly 40% of ... university-licensed startups ...
qualify as the “walking dead.”*

Data from University-licensed startups over 31 years
(1980-2011).

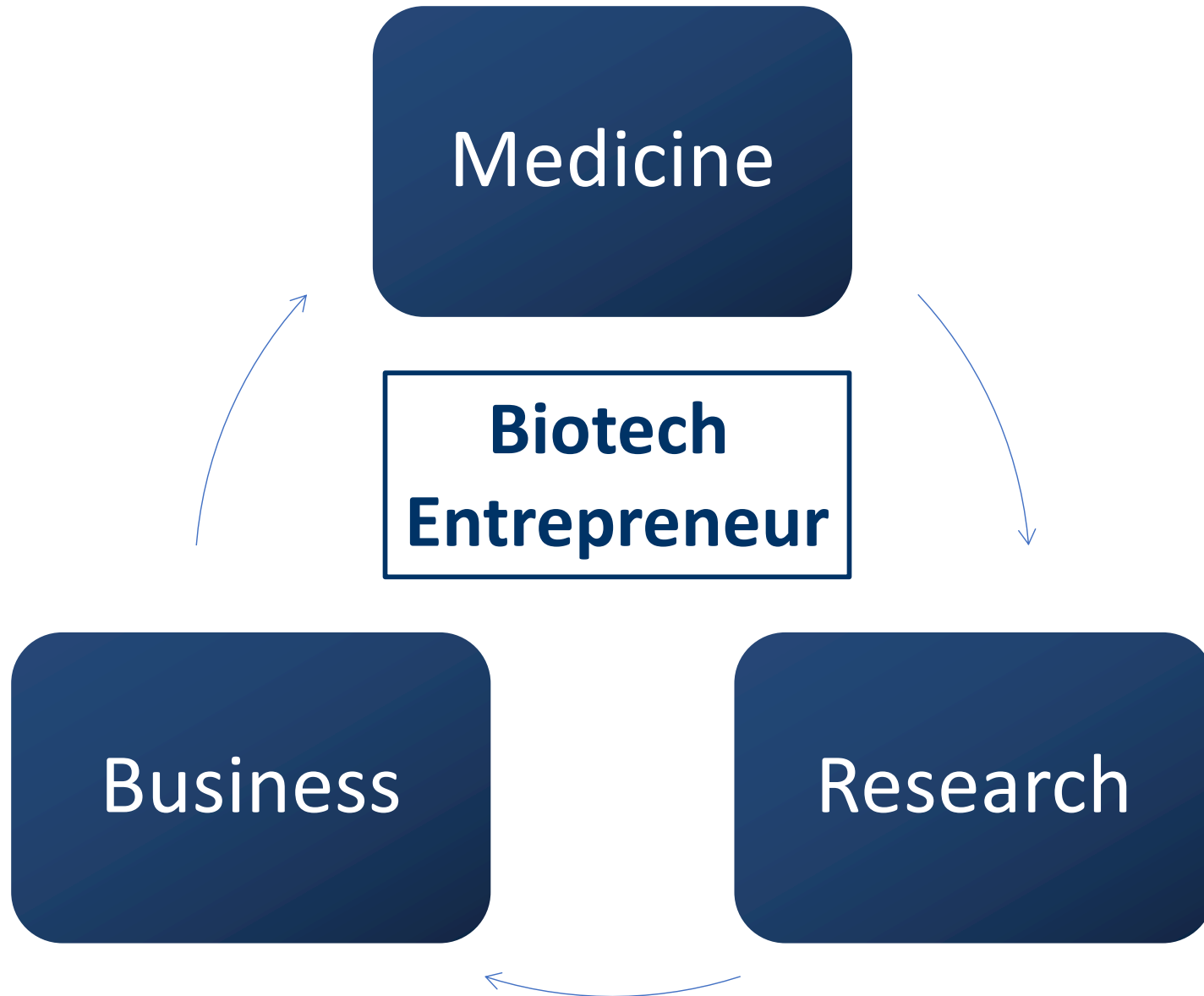
Nature Biotechnology, 2020

The biotech living and the walking dead.

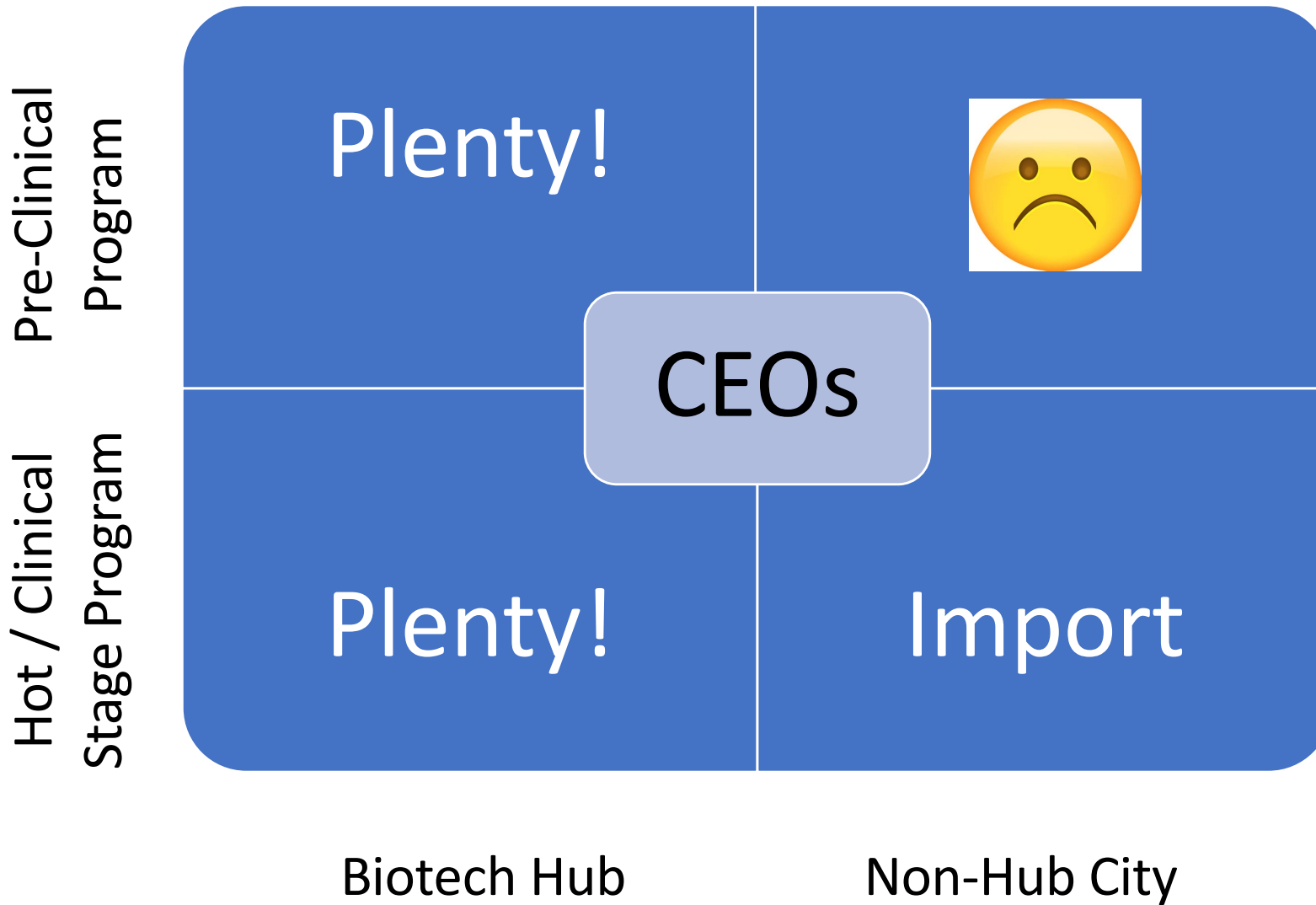
Godfrey, Allen, & Benson.

Nat Biotechnol **38**, 132–141

About Me

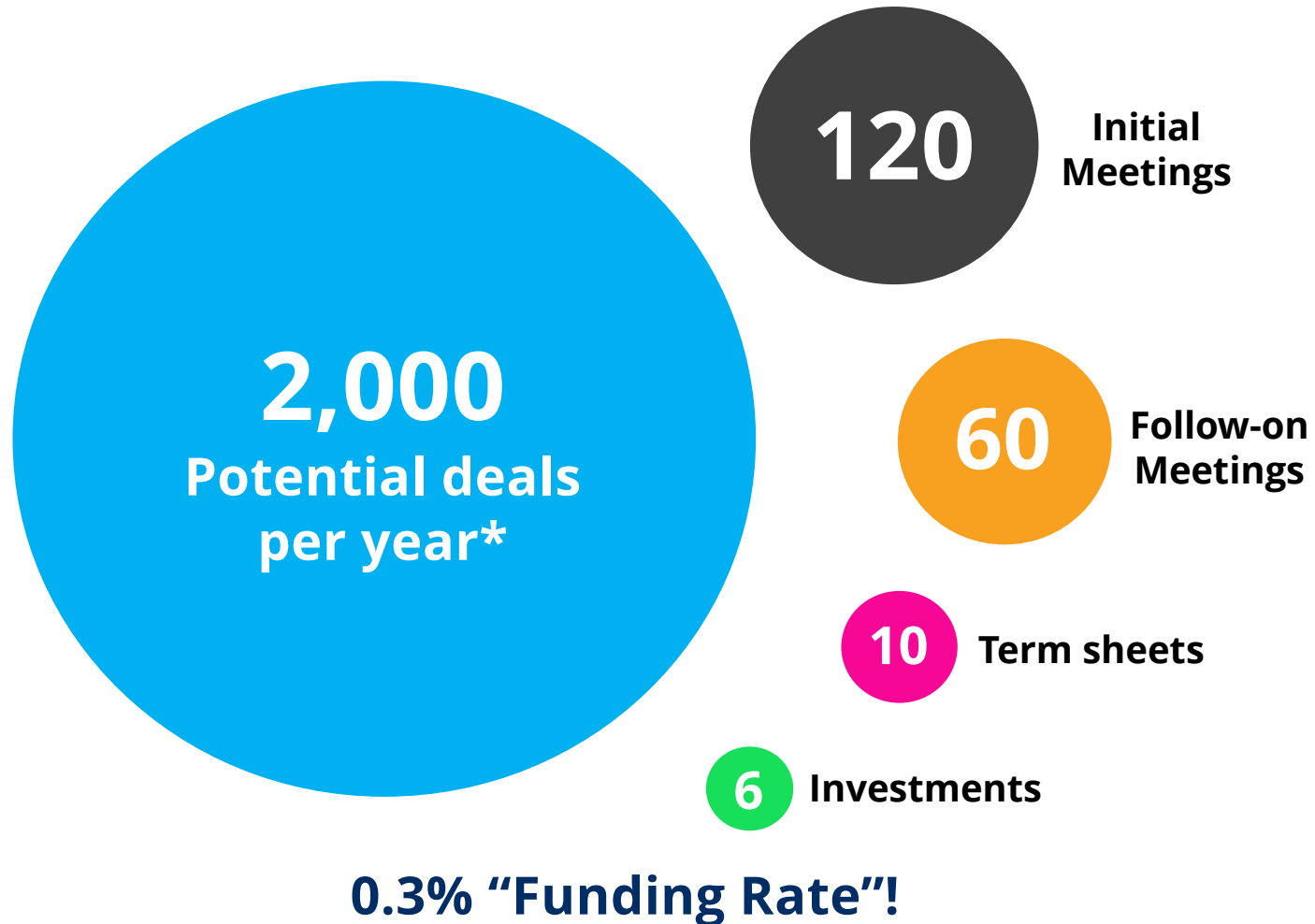


Finding Experienced CEOs Can Be Hard



Raising Early Capital Can Be Hard

Statistics from a Local VC *



* Consistent with other early stage Venture Capital Funds

Hurdle to Licensing Is High



Licensing/Acquisition Costs

Reconfirming original data
Product characterization
Intellectual Property
GMP manufacturing
Clinical programs
Regulatory costs
Marketing


Opportunity Costs
(other options)

Data Reproducibility Can Be A Challenge

The Reproducibility Crises in Biomedical Research and its Impact on Pharmaceutical R&D Productivity

Ülo Palm, MD, PhD,
Senior Vice President Clinical Operations & Biometrics
Forest Research Institute

February 11, 2013



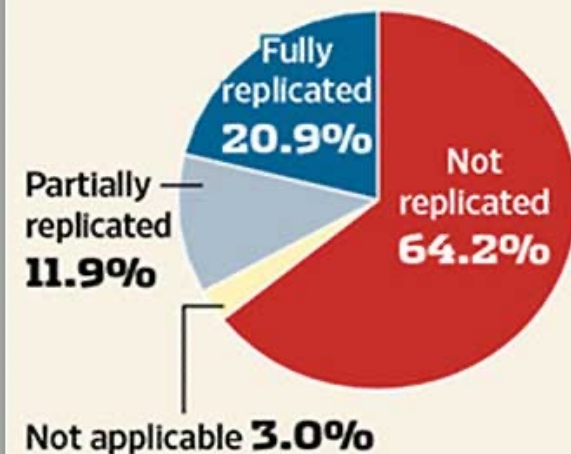
Drug development: Raise standards for preclinical cancer research

6 (11%) of 53 “landmark studies” reproduced by Amgen scientists.

Begley & Ellis. *Nature*. 483, 531-533, 2012

No Cure

When Bayer tried to replicate results of 67 studies published in academic journals, nearly two-thirds failed.



Source: Nature Reviews Drug Discovery

Prinz, Schlange, Asadullah. *Nature Reviews Drug Discovery*. 10, 712 (2011)

Some Options for Early Development

Partner early: engage with Pharma **R&D** (as alternative to BD).

If science is “hot”: **professional** investors may be interested.

Find creative ways (grants, family office, etc.), to **commercially** de-risk then re-engage with Pharma/investors.

Hybrid model offered by Fannin.



Build successful life sciences startups
Grow local life sciences entrepreneurs

“Here at TMC Innovation, we understand the impact a strong local ecosystem can have on young entrepreneurs. Fannin Innovation’s model is crucial for early-stage growth, as it affords access to ground-breaking science spun out of academia. This provides the foundation necessary for companies to flourish through the ecosystem, and ultimately, deliver impactful solutions to patients, faster.”

- Tom Luby

Director, TMC Innovation Institute

Active Development Programs



Pulmotect's lead product, Pul-042, is a clinical-stage inhaled therapeutic that stimulates innate immune system to prevent infection.*



Procyrion is in Phase 2 clinical testing of Aortix, a minimally invasive ambulatory device for treating the 2 million heart failure patients too sick for medication.*



Allterum is developing an IL-7R antibody for the treatment of pediatric T-Cell Acute Lymphoblastic Leukemia.



BreviTest is developing a rapid point-of-care diagnostic platform for sensitive and quantitative detection of analytes.



Aptamer Therapeutics Creative Group is developing targeted agents against several diseases including cancers and ataxias.



The **Cygnet** catheter system is a novel catheter and deployment system that will enable right heart catheterization in the cardiologist's office.



Atrapos is developing immunomodulatory therapeutics relevant to diseases including asthma.



Fannin has several programs whose licensing is underway.



Brimstalt is developing a targeted chemotherapy for cancer.



IP3 is a partnership with Texas Children's Hospital and Baylor College of Medicine that is developing a pipeline of novel medical devices that meet major unmet needs in the pediatric and neonatal space including:



Goldenrod is developing a small molecule to prevent pathogenic activity in a variety of immune cells, including those that contribute to neurodegeneration.



ChorioAnchor

ChorioAnchor is an absorbable implant that enables minimally invasive prenatal surgery to improve outcomes for babies with birth defects.



Raptamer Discovery Group™ specializes in the rapid development of Raptamers™ – next-generation DNA aptamers—using our proprietary methodology. Raptamer Discovery Group's mission is to help you find high-affinity binding molecules for your research or commercial application.



Securine is an implantable device that allows incontinent patients to have complete control over their bladder function resulting in a vastly improved quality of life.

* Clinical Stage

The Studio – In a Nutshell

An integrated approach to life sciences and human capital development



Academic Researchers



IP, Research/Clinical Collaborators
NOT part of management team



Experienced, Pooled
Team



Address CEO Bottleneck



Interns and Fellows



Amplify Team
Train Emerging Entrepreneurs



Smart Funding



Risk- and Stage-Optimized \$\$\$

“My primary responsibility at MD Anderson is to support innovation by assisting our faculty who are pursuing the commercialization their research. Fannin plays an important role in this process, working closely with some of our researchers and clinicians to advance development and spin out companies, while providing opportunities for life sciences entrepreneurs to train and grow. I enjoy working with the Fannin team and I appreciate the critical role they play in our local ecosystem.”

- Chris Taylor

Director, Office of Career & Entrepreneurship Advancement, University of
Texas MD Anderson Cancer Center

Our Inventors and Collaborators



Roberto Adachi, MD
Associate Professor
Pulmonary Medicine
MD Anderson Cancer Center



Burton Dickey, MD
Professor & Chair
Pulmonary Medicine
MD Anderson Cancer Center



Sebastian Johnston
Professor
Respiratory Medicine & Allergy
Imperial College London



Eric S. Schafer, MD, MHS
Assistant Professor
Pediatrics-Oncology
Texas Children's Hospital



Michael Belfort, MD, PhD
Professor & Chair
Dept of OB/GYN
Baylor College of Medicine



Scott K. Durum, PhD
Senior Investigator
Cancer & Inflammation Program
National Cancer Institute



John Morgan Knight, PhD
Instructor
Immunology, Allergy & Rheumatology
Baylor College of Medicine



Ajay Sheshadri, MD
Assistant Professor
Pulmonary Medicine
MD Anderson Cancer Center



Achu Byju, PhD
Research Associate II
Biomedical Engineering
Texas A&M University



Jimmy Espinoza, MD
Co-Director
OB/GYN & Fetal Center
Texas Children's Hospital



Chester Koh, MD
Professor
Urology, Pediatrics, and OB/GYN
Texas Children's Hospital



Anil K. Sood, MD
Professor & Vice Chairman
Gyn. Oncology & Rep. Med
MD Anderson Cancer Center



Roy F. Chemaly, MD, MPH
Professor
Infectious Diseases
MD Anderson Cancer Center



Scott E. Evans, MD, FCCP
Professor
Pulmonary Medicine
MD Anderson Cancer Center



Andras Lacko, PhD
Professor
Physiology & Anatomy
University of North Texas



Kara Toman, MPH
Senior Research Director
Pediatric Urology
Texas Children's Hospital



Seong H. Cho, MD
Associate Professor
Allergy and Immunology
University of South Florida



David Gorenstein, PhD
President and Founder
AptaMed, Inc.



Duncan Maitland, PhD
Professor
Biomedical Engineering
Texas A&M University



Michael Tuvim, PhD
Professor
Pulmonary Medicine
MD Anderson Cancer Center



William E. Cohn MD, FACS, FACC, FAHA
Director
Center for Technology Innovation
Texas Heart Institute



Balakrishna Haridas, PhD
Senior Director
Front End Innovation
Ethicon Inc., J&J Medical Devices



Kanwal Raghav, MBBS, MD
Associate Professor
Genitourinary Medical Oncology
MD Anderson Cancer Center



Sara J. Ward, PhD
Assistant Professor
Pharmacology
Temple University



David Corry, MD
Professor
Immunology, Allergy & Rheumatology
Baylor College of Medicine



Magnus Höök, PhD
Regent Professor & Director
Infectious & Inflammatory Diseases
Texas A&M University



Reynolds M. Delgado III, MD, FACC
Medical Director
Mechanical Assist Devices
Texas Heart Institute



Corey Hopkins, PhD
Associate Professor
Pharmaceutical Sciences
University of Nebraska



“As the world’s leading cancer hospital, the research and clinical faculty at MD Anderson generates a remarkable breadth of basic sciences and clinical insights. Fannin provides unique approach to partnering with academic researchers to advance innovation, with the goal of helping shape the future of patient care.”

Ronald A. DePinho, MD -
Former President of MD Anderson Cancer Center



Core Fannin Team & Portfolio Leadership

Our Core Team



Team Attributes:

- Experience in drug and device development
- Medical/Scientific/Engineering background
- Interest in life sciences entrepreneurship
- Business/project management experience
- Strong history of leadership

Procyron



Eric Fain, MD
President & CEO, Procyron



Jason Heuring, PhD
COO, Procyron



Av Edidin, PhD
Sr. VP, Development & Manufacturing



PULMOTECT



Colin Broom, BSc, MB BS, MRCP, FFPM
CEO, Pulmotect



Brenton Scott, PhD, MBA
President, Pulmotect



John Schaumberg, PhD
Clinical Operations, Pulmotect

Our Internship & Fellowship Program



- Targets 8,000+ early-career scientists and engineers with interest in entrepreneurship opportunities in Houston
- Provides experiential learning through hands-on development with life sciences startups
- Part-time internships and 2-year fulltime fellowship programs for different career stages.
- 225+ interns and fellows from 40 different institutions across the U.S. over the last decade

“Baylor College of Medicine values its strong relationship with Fannin Innovation Studio. The Fannin approach is particularly valuable in Houston biomedical commercialization ecosystem because it directly addresses the pressing need for more experienced entrepreneurial talent through its innovative internship program, which has served with “real-world” product development experience.”

-Michael Dilling, PhD
 Director, Baylor Licensing Group



Grants and Disciplined Capital Deployment

\$140M	GRANTS		INVESTORS
	\$22M	\$16M	\$102+M
Total investment in programs	SBIR/STTR funding awarded	Additional non-SBIR/STTR grant funding	Total investor dollars raised across technologies

Program	Topic	Agency; SBIR/STTR grant number
Pulmotect	Asthma, Anti-infective	NIH/NHLBI: 1R43 HL115903 01; 2R44 HL115903 02 ; 1R43 HL118926 01A1; 2R44 HL118926 02; 9R44 HL127677 04; 5R44 HL127677 05; 5R44 HL127677 06; NIH/NIAID: 1R43 AI092904 01; 2R44 AI092904 02A1; 5R44 AI092904 03; <i>Has also received a UO1 & support from the Texas CPRIT fund</i>
Allterum	T-ALL Therapeutic Antibody	<i>Has received support from the Texas CPRIT fund</i>
Acelerox	Alzheimer's Disease	NIH/NIA: 1R41 AG 055254 01 A1; <i>Has also received support from the Texas CPRIT fund</i>
ATCG	Aptamers / Friedreich's Ataxia	<i>Has received a grant from the Christina Foundation for Friedreich's Ataxia. NIH: 1R44OD030205-01</i>
Atrapos	Stat6/Asthma/Atopic Dermatitis	NIH/NIAID: 1R41 AI125007 01A1; 1 R43 AI131867-01; 7R44AI125007-03 <i>Has also received a SMARTT award from NHLBI</i>
BreviTest	POC-ELISA/Opioid/ Health Disparities	NIH/NIDA: 3R43 DA041966 01S1; 1R43 DA041966 01; 1R43DA043325-01; 2R44DA043325-02; 1R43MD013409-01A1
Exotect	Asthma	NIH/NHLBI: 1R41HL136057-01
Goldenrod	Opioid Dependence	NIH: 162 1R43DA053124-01
GuidaBot	MRI robot	NSF: 1622946
IP3	Pediatric & Fetal Surgery	NIH/NIDDKNIH/ NICHD: 1R43 DK115336-01; 1R43 HD094456-01; 2R44HD094456-02; 1R43DK123908-01; <i>Has also FDA subaward: 1P50FD006428-01</i>
Raptamer Discovery Group	Aptamers	NIH: 1R43GM084552-01; 5R43GM084552-02; 1R43CA141842-01; 2R44GM084552-03; 5R44GM084552-04; 1R43GM086937-01A1; 1R43GM100777-01; 1R43GM108110-01; 5R43GM108110-02; 2R44GM108110-03; 5R44GM108110-04; 3R43GM108110-02S1; 2R44GM086937-02; 5R44GM086937-03; 1R43GM126604-01; 5R43GM126604-02; 6R43GM126604-03; <i>Has also received support from NASA and Bill & Melinda Gates Foundation</i>
rHDL	Cancer & Liver diseases	NIH/NCATS: 1R43TR002043-01; 3R43TR002043-01W1; 1R43AG062064-01

"Fannin's unique model has successfully created new ventures locally in partnership with faculty at top-tier academic institutions. Their impact is further amplified by their entrepreneur development program which includes active outreach to women and minorities. We are pleased that Fannin has been actively engaged with the SBA in many ways. Apart from winning many SBIR/STTR awards, as well as the Tibbetts Award, they have served on review panels and participated in outreach events across the country and work locally with several groups within our network. We wish them the very best."

- Tim Jeffcoat

Director, US Small Business Administration – Houston District Office

Creating Value for Early-Stage Technologies



“The Fannin Innovation model addresses (an) obvious mis-match by addressing the needs of medical device and therapeutics start ups from a long term, capital efficient perspective. It is my observation that such a business development model also develops the human skill set that empowers future industry leaders. Fannin is a blueprint for a business model that should be honed and expanded nationally.”

- Rob Tucci

Managing Director, Texas Halo Fund

Questions? Suggestions?



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