TABLE OF CONTENTS
FOR
TECHNOLOGY TRANSFER AND RESEARCH COMMITTEE

Committee Meeting: 5/11/2016

Board Meeting: 5/12/2016
Austin, Texas

Wallace L. Hall, Jr., Chairman
Ernest Aliseda
Alex M. Cranberg
Brenda Pejovich
Sara Martinez Tucker

1. U. T. System Board of Regents: Discussion and appropriate action regarding Consent Agenda items, if any, assigned for Committee consideration

RECOMMENDATION

No Consent Agenda items are assigned for review by this Committee. The Consent Agenda begins on Page 251.

2. U. T. System: Report on a systematic assessment of how to best advance Offices of Technology Commercialization and the process of commercialization of discovery across the U. T. System

REPORT

Ms. Julie Goonewardene, Associate Vice Chancellor for Innovation and Strategic Investment and Managing Director of the U. T. Horizon Fund, will report on an assessment conducted on U. T. System institutions' Offices of Technology Commercialization in response to a recommendation from the report titled, "*Task Force on Intellectual Property: Disposition, Practices, and Mechanisms of Implementation*," issued in August 2014 by the U. T. System Task Force on Intellectual Property (IP) Issues. A PowerPoint presentation is set forth on the following pages.

BACKGROUND INFORMATION

The IP Task Force, created by Chairman Foster on February 6, 2014, was charged to evaluate the intent, rationale, current language, workability, and requirements of the U. T. System Board of Regents' *Rules and Regulations* related to the disposition and management of research-derived intellectual property at U. T. System institutions and to recommend changes or revisions of the Regents' Rules to the Board of Regents. The Task Force issued a report in August 2014 titled, "*Task Force on Intellectual Property: Disposition, Practices, and Mechanisms of Implementation*." The report was accepted and recommendations approved by the Board of Regents on February 12, 2015.

One of the recommendations from the report was to "carry out a systematic assessment of how to best advance Offices of Technology Commercialization and the process of commercialization of discovery at each U. T. System institution."

In response to the IP Task Force recommendation, an assessment was conducted to:

1. Provide information on the approach used for assessing technology commercialization across U. T. System institutions.

2. Present findings on "how to best advance offices of technology commercialization and the processes of discovery at each U. T. System institution and across and between U. T. System institutions."

3. Recommend the mechanisms by which U. T. System can provide commercialization resources that will incentivize, promote, and support commercialization by U. T. System institutions.

A Systematic Assessment of How to Best Advance Offices of Technology Commercialization and the Process of Commercialization of Discovery Across the U. T. System

Ms. Julie Goonewardene
Associate Vice Chancellor for Innovation and Strategic Investment and
Managing Director of the U. T. Horizon Fund

U. T. System Board of Regents' Meeting
Technology Transfer and Research Committee
May 2016

Recommendations from Review

- **Recommendation 1**: Presidents at each U. T. System institution should clearly articulate the mission and corresponding primary metrics of their commercialization offices
- **Recommendation 2**: Establish a first-of-its-kind U. T. System Commercialization Fund to advance the commercialization missions and primary objectives of U. T. System institutions
- **Recommendation 3**: Launch the U. T. System Proof-of-Concept Fund and the Patent Nationalization Program, as part of the U. T. System Commercialization Fund, and continue to support royalty audits
- **Recommendation 4**: Gather data from the U. T. System Mentor Network pilot program to inform next steps for a U. T. System Entrepreneurship-in-Residence (EIR) program

How do these Recommendations Strengthen Us?

- Creates a mechanism by which U. T. System can incent commercialization activity across mission critical areas
- Clarifies the role of commercialization offices across U. T. System
- Avoids defining commercialization missions and metrics for institutions
- Builds an innovation pipeline that serves administrators, innovators, and commercialization offices across academic and health center institutions

Which Data Informed the Recommendations?

- Self-reported performance data to the Association of University Technology Managers (AUTM) from FY 2012 - 2014
- May 2015 - July 2015: U. T. System Office of Technology Commercialization (OTC) staff traveled to all U. T. System institutions and met with administrators, commercialization staff, and other stakeholders, such as faculty and entrepreneurs
- October 2015: Follow-on survey was sent to commercialization office directors to gather information on the mission statement, organizational structure, core commercialization areas, and primary challenges and opportunities faced by their offices
- November 2015: Survey was sent to various stakeholders on perceptions of commercialization/entrepreneurship objectives and services offered at U. T. System institutions

Three-Year Average Performance Self-Reported to AUTM for the Top 10 Commercialization Institutions/Systems in the United States, FY 2012 - 2014

(Note – Top 5 shown below)

Measure	Top 5	U. C. System		MIT		U. T. System		Columbia		Stanford	
Overall Rank			1		2		3		4		5
Avg. Licensing Revenues ($M)	101.4	107.5	3	91.6	5	56.4	8	160.9	2	90.8	6
Avg. Licenses Issued	116.3	214.0	2	75.3	8	117.0	3	76.0	7	99.0	5
Avg. Licenses $1M+	9.7	15.7	1	11.0	2	9.7	3	7.0	4	5.3	7
Avg. Total Research Expenditures ($M)	2,232.2	5,410.7	1	1,561.1	3	2,548.6	2	769.0	8	871.7	7
Avg. Federal Research Expenditures ($M)	1,350.4	2,870.6	1	1,309.7	2	1,265.9	3	646.4	7	659.5	6
Avg. Industry Research Expenditures ($M)	181.8	360.0	1	109.5	2	257.7	3	N/A	-	71.3	6
Avg. Prov. Patents Filed	387.0	811.3	1	418.3	2	318.3	3	N/A	-	268.7	4
Avg. U.S. Patents Issued	226.1	384.7	1	271.0	2	187.0	4	92.3	7	195.7	3
Avg. Legal Fees ($M)	17.2	36.3	1	18.2	2	9.7	4	12.7	3	9.3	5
Avg. Legal Fees Reimbursed ($M)	8.7	21.0	1	10.4	2	4.5	3	3.9	5	3.7	6
Avg. Number of Startups	27.2	65.3	1	16.7	4	22.3	2	15.7	7	16.0	5

How Unique Are Each of the Offices?

Institution	UTA	UTAUS	UTD	UTEP	UTHSCH	UTHSCSA	UTHSCT	UTMB	UTMDA	UTPB	UTRGV	UTSA	UTSWMC	UTT	Totals
Total staff	3.0	23.0	6.5	5.0	6.5	5.0	0.0	6.0	10.0	0.0	2.5	4.0	22.5	1.0	95.0
Total research expenditures ($M)	71.1	585.3	99.7	74.5	223.4	178.3	11.0	124.8	736.2	1.2	18.9	45.4	398.6	4.6	2,573.0
Total industrial research expenditures ($M)	5.5	71.3	9.0	2.0	42.6	32.4	0.6	10.1	75.3	0.2	1.0	Not Avail.	25.0	0.0	275.0
Licenses executed	3	21	2	1	27	11	1	7	9	0	3	6	37	0	128
Provisional patents filed	38	102	25	12	15	21	1	11	37	0	3	31	47	0	343
U.S. patents issued	21	50	11	5	23	11	1	24	27	0	3	2	31	0	209
Start-up companies formed	1	7	0	1	2	2	0	2	3	0	1	2	6	0	27
Licensing revenue ($M)	0.0	17.1	0.1	0.0	3.3	2.8	0.0	2.1	21.5	0.0	0.1	0.1	5.4	0.0	52.5
Legal expenditures ($M)	0.4	2.4	0.4	0.2	1.0	0.4	0.1	0.7	2.9	0.0	0.1	0.3	1.2	0.0	10.1
Reimbursements for legal expenditures ($M)	0.0	0.3	0.1	0.0	1.0	0.3	0.0	0.1	2.2	0.0	0.0	0.1	0.6	0.0	4.8

Findings: Mission Statements

- Commercialization missions at many U. T. System institutions are unclear to their various stakeholders

3. In terms of defining commercialization success, how would you best summarize your understanding of the top priority of leadership at your institution?	
Answer Options	Response Percent
Providing excellent service to faculty, students and staff	37.8%
Generating revenues	18.9%
Positively impacting peoples' lives	25.7%
Other	17.6%
Responses	74

Findings: Challenges and Opportunities

Self-Reported Commercialization Challenges and Opportunities (by Institution Type)

U. T. Health Institutions

Challenges	Opportunities
	

U. T. Academic Institutions

Challenges	Opportunities
	

- Two main challenges/ opportunities:
  - Resources
  - Funding

Resources: Proof-of-Concept Fund

- The majority of top-tier institutions across the nation operate a proof-of-concept program, including:
  - University of California System ($8M in proof-of-concept funding to 55 projects between 2011-2013)
  - State University of New York ($1.5M in funding has led to $3.5M in funding from external partners since 2011)
  - University of Illinois ($1M proof-of-concept funding since 2009 has led to 9 startup companies, $49M raised in venture and angel funding, and $1.3M in additional government funding support)
- Compared to peers, U. T. System is behind the curve in providing proof-of-concept resources that can significantly benefit the U. T. System institutions

Resources: Patent Nationalization Program

Self-Reported Data to OTC on Patent Budget at the Beginning of FY2014 and Actual Patent Expenditures for FY2014 across U. T. System Institutions

Institution	Patent Budget at Beginning of FY2014 ($M)	Actual Patent Expenditures for FY2014 ($M)
U. T. Arlington	0.00	0.45
U. T. Austin	2.00	2.40
U. T. Dallas	0.61	0.39
U. T. El Paso	0.07	0.20
U. T. Health Science Center - Houston	1.18	1.18
U. T. Health Science Center - San Antonio	0.40	0.43
U. T. Health Science Center - Tyler	0.00	0.00
U. T. M. D. Anderson Cancer Center	2.50	2.86
U. T. Medical Branch - Galveston	0.90	0.67
U. T. Permian Basin	0.00	0.00
U. T. Rio Grande Valley	0.09	0.07
U. T. San Antonio	0.25	0.33
U. T. Southwestern Medical Center	1.20	0.65
U. T. Tyler	0.00	0.00

Note – U. T. Rio Grande Valley data is comprised of the aggregated data reported by U. T. Brownsville and U. T. Pan American

Resources: Royalty Audits

- Commercialization offices are limited in their ability to monitor delinquent licensee
- In larger offices across the nation, a best practice is to regularly audit licensing portfolios to identify licensees who may owe millions of dollars in delinquent royalty payments
- From on-site interviews, a majority of commercialization office directors from the health science centers identified royalty audits as a useful resource that OTC has funded in the past

Resources: Entrepreneur-in-Residence Program (EIR)

- A number of the U. T. System institutions stated that they would like assistance in attracting executive talent to work with U. T.-related startups
- MIT, Columbia, Stanford, and UCLA, have accomplished this objective through mentoring and EIR programs
- Startups often attribute their success to top-notch and experienced management teams, as well as well-connected mentors that enable fundraising, hiring, partnerships, customers, etc.
- U. T. System has not yet capitalized on its brand and size to develop and strengthen an integrated mentor network across its institutions

Recommendation 1

- **Presidents at each institution should clearly articulate the mission and corresponding primary metrics of their commercialization programs**
  - Establish a common understanding of commercialization measures from those reported in AUTM licensing surveys
  - Directors will select and provide to the OTC primary metrics that will help them to achieve their objectives
  - OTC will generate a Systemwide annual report that will present the most exciting commercialization advances across U. T. System and promote the objectives of the institutions, as well as report on Systemwide performance metrics

Recommendation 2

- **Establish a first-of-its-kind U. T. System Commercialization Fund to advance the commercialization mission and primary objectives of the U. T. System institutions**
  - OTC will work together with commercialization office directors to create the structure and a transparent and equitable process for the allocation of resources and funds across institutions
  - OTC is particularly interested in advancing commercialization across mission critical areas
  - Utilizing Available University Funds as a first source of capital, the primary purpose of this fund will be to advance the commercialization missions and improve performance across the metrics provided by U. T. System institutions

Recommendation 3

- **Launch the U. T. System Proof-of-Concept (POC) Fund and the Patent Nationalization Program (PNP), as part of the U. T. System Commercialization Fund, and continue to support royalty audits**
  - POC will offer finite, milestone-based awards intended to advance research products/technologies and improve the probability of attracting further extramural funding and market interest
  - PNP will provide funding for the nationalization of patents to commercialization offices, which will increase the value of U. T.-generated intellectual property, as well as improve the marketability of these assets
  - The Commercialization Fund will support third-party royalty audits to identify licensees who are not fulfilling their financial obligations to the commercialization offices

Discussion: A Strategic Approach to the POC Fund

- **Potential funding sources:** Philanthropic (unrestricted)/AUF (restricted)
- **Objective:** Provide gap funding to accelerate the research/development and commercialization of mission-critical areas
- **Structure:** Centrally administered through U. T. System OTC and in collaboration with U. T. System institutions
- **Selection:** External review committee
- **Impact:** Increase likelihood of follow-on research funding; decrease time to commercialize research; increase deal flow for U. T. System OTCs and the U. T. Horizon Fund
- **Sustainability:** Implement mechanisms to return POC capital invested (i.e., investment rights, equity options, or reimbursement through royalty payments received by OTCs)

Recommendation 4

- **Gather data from the U. T. System Mentor Network pilot program to inform next steps for a U. T. System EIR program**
  - OTC will seek to build a strong mentor and executive network as the basis for informing the structure and goals of a potential EIR program
  - The OTC is already in the process of launching a U. T. System Mentor Network, which will be organized in the first half of 2016 and piloted in August 2016
  - One key objective of the pilot is to establish a baseline on the potential benefits and associated costs with a formal EIR program
  - Analysis will be completed at the end of 2016 and presented to the Intellectual Property Task Force at that time

Follow-up Actions

- Task the presidents of all U. T. System institutions to work with their commercialization offices to clearly articulate a commercialization mission and corresponding metrics
- Task U. T. System institutions to communicate their commercialization mission and objectives in all relevant internal and external marketing materials
- Task the OTC to work with commercialization office directors across U. T. System to create the structure and process for the U. T. System Commercialization Fund
- Recommend to the Board of Regents the authorization of funding towards the U. T. System Commercialization Fund, which will include a U. T. System POC Fund, Patent Nationalization Program, and support for royalty audits
- Task the OTC to gather data from the U. T. System Mentor Network pilot program and provide a report on the benefits and costs related to a Systemwide EIR program

3. U. T. System: Report on MicroTransponder, a U. T. Horizon Fund Portfolio Company

REPORT

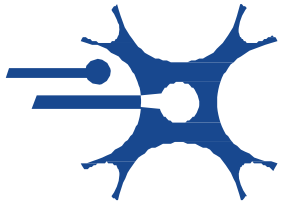
Ms. Julie Goonewardene, Associate Vice Chancellor for Innovation and Strategic Investment and Managing Director of the U. T. Horizon Fund, will introduce Mr. Frank McEachern, J.D., Chief Executive Officer of MicroTransponder, a U. T. Horizon Fund portfolio company. Mr. McEachern will report on the activities and progress of MicroTransponder. A PowerPoint presentation is set forth on the following pages.

BACKGROUND INFORMATION

The dual-purpose mission of the U. T. Horizon Fund is to 1) help move novel technologies to the marketplace to impact the world, and 2) create a positive financial return. To achieve its dual-purpose mission, the U. T. Horizon Fund invests both (i) in companies utilizing U. T. System innovations, and (ii) in companies in which U. T. System holds an existing equity interest, but which may not necessarily be utilizing U. T. System innovations.

MicroTransponder is a U. T. Horizon Fund portfolio company that embodies the Fund's dual-purpose mission. The clinical-stage company is leveraging decades of neuroscience research to develop treatments for two separate neurological conditions: chronic tinnitus and post-stroke upper limb mobility issues. Chronic tinnitus is the persistent presence of noise in a person's ears or head and, according to the NIH, is a primary condition reported by veterans who served in Iraq and Afghanistan. Also as reported by the NIH, stroke is the leading cause of long-term disability in the U.S., affecting nearly four million stroke victims directly and tens of millions more whose lives are interconnected. In pursuit of its therapies, MicroTransponder has completed numerous scientific collaborations with researchers from U. T. Dallas and other leading universities and is currently completing pivotal trial-enabling studies at multiple clinical trial sites in Texas and throughout the U.S.

Mr. McEachern has worked as a corporate securities attorney at Baker Botts, LLP, where he represented Advanced Neuromodulation Systems (ANS) in their merger with St. Jude Medical, the largest neurostimulation merger to date. He has nearly a decade of executive leadership experience in the implantable neurostimulation field and serves on the Board of the Texas Biomedical Device Center at U. T. Dallas. Mr. McEachern received a B.B.A. from U. T. Austin Business Honors Program and completed a J.D. from U. T. Austin.



MicroTransponder

Frank McEachern - CEO

Corporate Presentation

U. T. System Board of Regents' Meeting
Technology Transfer and Research Committee
May 2016

Our Markets

Paired Stroke Rehab

695,000

Annual incidence of ischemic stroke
~1 person every 45 seconds

320,000

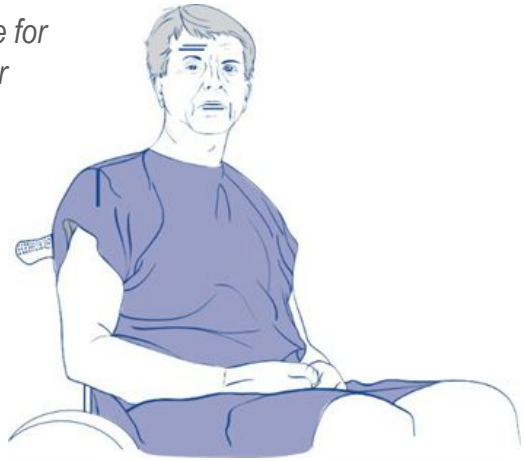
Patients who still suffer from upper arm deficits 3 months post their stroke

$140,000

Direct Medical Cost of care for an ischemic stroke survivor

$73.7 BLN

How much the US spent on stroke-related costs and disability; patients require daily assistance from family members or paid healthcare workers.



Tinnitus

3.9 Million

People in the U.S. with severe, tonal tinnitus

No drugs approved in the U.S. or EU for tinnitus.

#1 disability among recent U.S. Veterans
$1.6B in annual VA disability payments

Currently, no effective treatment.

Note: Cyberonics (NASDAQ: CYBX, $1.6BLN Market Cap) is the largest neurostimulation company focused solely on VNS. Annually it sells 14,520 Devices. (9,850 in U.S., 4,670 OUS)

How MicroTransponder Found the Product: A Visual Chronology

Neuroscientists from U. T. Dallas develop a novel therapy platform to treat a wide range of neurological disorders.

2007

Funding

TEXAS EMERGING TECHNOLOGY FUND

Identified Tinnitus and Stroke as the 2 most promising areas for research and development.

2008

Series A

2010

Series B

Research Grant

NATIONAL INSTITUTES OF HEALTH

The NEW ENGLAND JOURNAL of MEDICINE

nature

150 news articles would follow Nature's publication (February 2011)

2012

Series B1

Clinical Grant

NATIONAL INSTITUTES OF HEALTH

Adapted existing pacemaker technology to deliver MicroTransponder's novel therapies.

Series B1 Follow-on

2014

UK Stroke Study Initiated

20 Patients

2015

US Stroke Trial Initiated

Why MicroTransponder Pursued the Indication: Stroke Rehab

The NEW ENGLAND JOURNAL of MEDICINE

Harnessing Plasticity to Reset Dysfunctional Neurons

nature

Reversing Pathological Neural Activity Using Targeted Plasticity

22 Academic Publications

Nature
New England Journal of Medicine
Neuromodulation
Neuroscience
Cerebral Cortex
Hearing Research
Biologicial Psychiatry
Stroke
Brain Stimulation

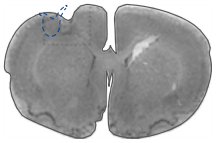
The pre-clinical data showed that Vagus Nerve Stimulation (VNS) therapy paired with rehab was effective over a wide range of brain damage suffered by stroke subjects.

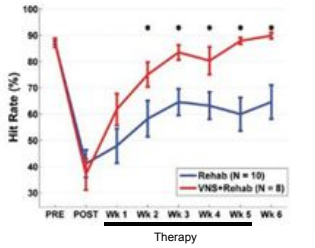
The pre-clinical data also showed that the therapy worked across disabilities common to the target populations:

Chronic Stroke

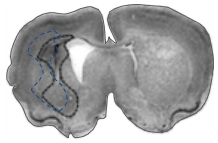
Patients whose stroke events occured a long time ago and still have disabilities.

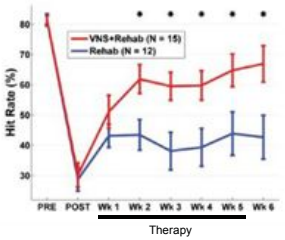
Cortical Ischemic Stroke



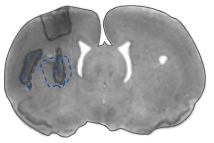


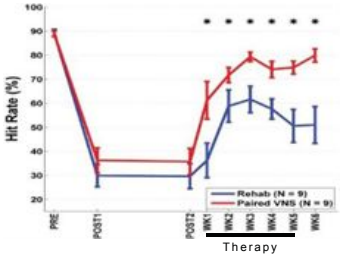
Hemorrhragic Stroke



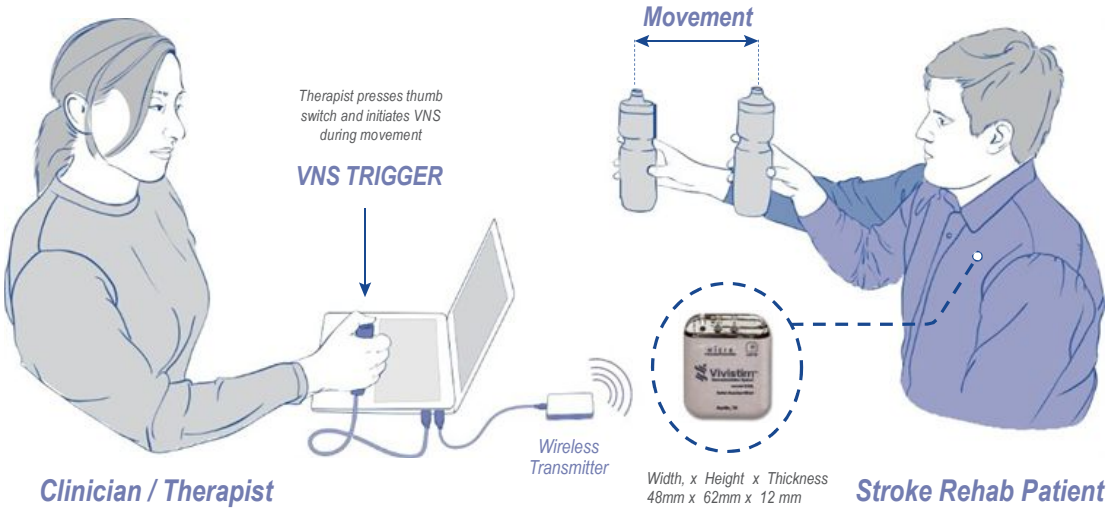


Cortical / Subcortical Ischemic Stroke





What is the Product: Stroke Rehabilitation



Paired Vagus Nerve Stimulation (VNS)

with Physical Therapy

Therapist uses thumb switch to trigger VNS during physical movements by the patient.
Stimulation of the vagus nerve releases important brain chemicals involved in learning and plasticity.
These chemicals strengthen brain circuits that are responsible for arm movement. Therefore, pairing movements with VNS is important.

Safety Well Established
VNS medical implants started in 1997

100,000 patients
Use implanted VNS for Epilepsy
Implant is placed in left pectoral region

75 Minutes
Duration of implanting procedure

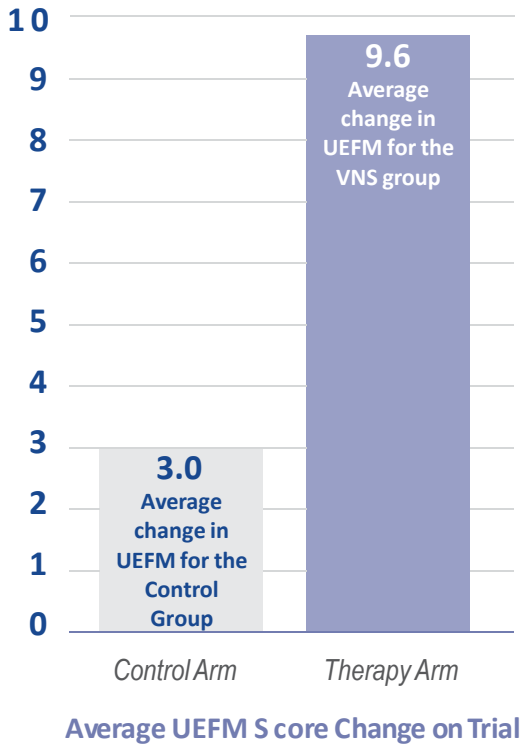
90 Minutes
Duration of treatment

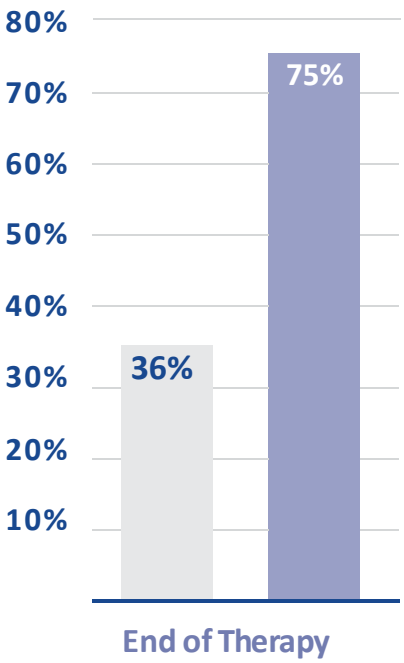
3
Treatments per week

6 weeks
Duration of treatment cycle

Cyberonics
2014 VNS sales $292M

How We Know It Works: Stroke Rehabilitation





UEFM – Upper Extremity Fugl-Meyer, the gold standard of measuring movement. A change in score ≥ 6 is considered clinicinally meaningful (responder)

- *75% of Patients Responded to the Therapy*
- *The 9.6 Change in UEFM Score is Statistically Significant Compared to Control (p= .038)*
- *Chronic Patient Population – Average of 1.8 Years Post-Stroke*
- *"These results are impressive. This therapy has the potential to improve the lives of my patients."*

  Stephen Cramer, M.D.
  Director, Clinical Translational Science at UC Irvine

What is the Product: Tinnitus

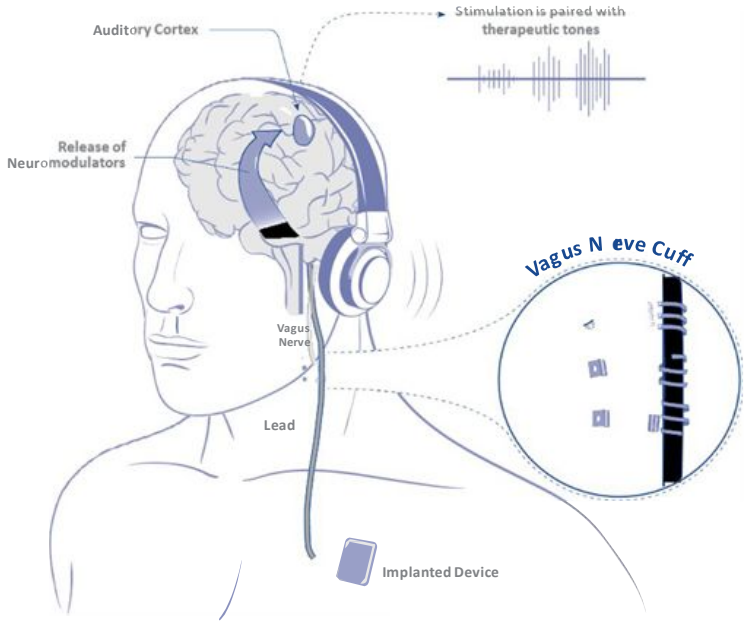
For Tinnitus, we pair stimulation with tones

Dimensions (mm)

Width, x Height x Thickness
48mm x 62mm x 12 mm

Neuroplasticity

Pairing tones with VNS increases the brain's ability to repair brain circuits and reduce the perception of tinnitus.



At-Home Therapy

Patients administer the therapy from the comfort of their own home. No therapist required.

Patient Begins Sound Therapy

Therapeutic tones are played outside of patient's tinnitus frequency.

Why MicroTransponder Pursued the Indication: Tinnitus

The NEW ENGLAND JOURNAL of MEDICINE

Harnessing Plasticity to Reset Dysfunctional Neurons

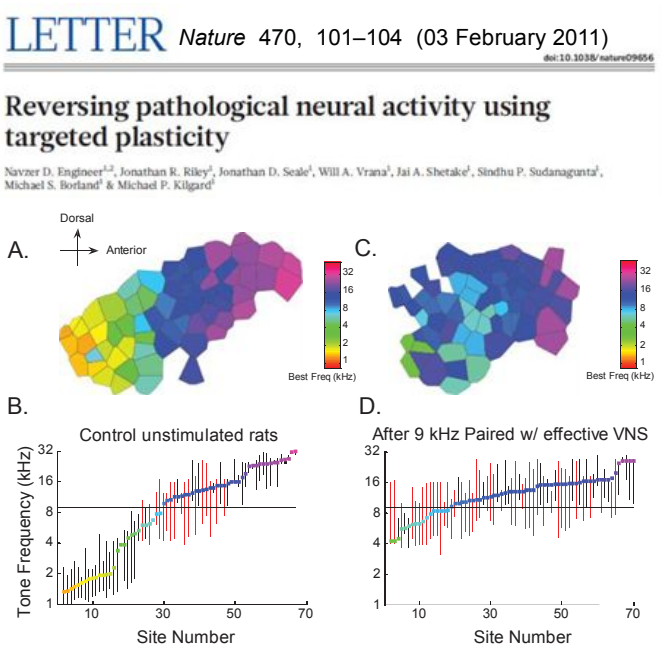
nature

Reversing Pathological Neural Activity Using Targeted Plasticity

22 Academic Publications

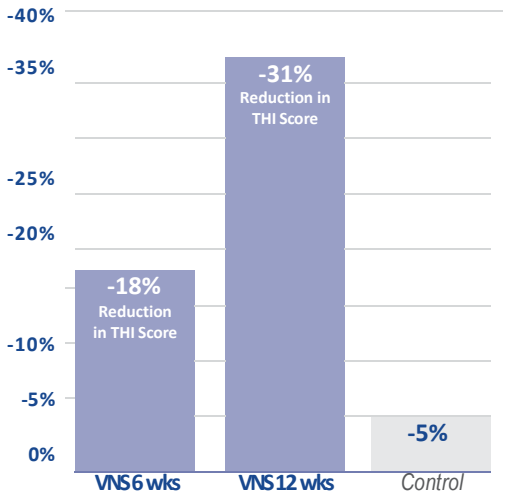
Nature
New England Journal of Medicine
Neuromodulation
Neuroscience
Cerebral Cortex
Hearing Research
Biologicial Psychiatry
Stroke
Brain Stimulation

After trauma that damages a person's hearing, there is lack of auditory input to one or more regions of the auditory cortex in the brain. A region in the auditory cortex not receiving its normal input will seek input from neighboring regions and this interference causes a malfunctioning circuit. The auditory neurons start firing spontaneously and in unison - this is perceived as tinnitus.



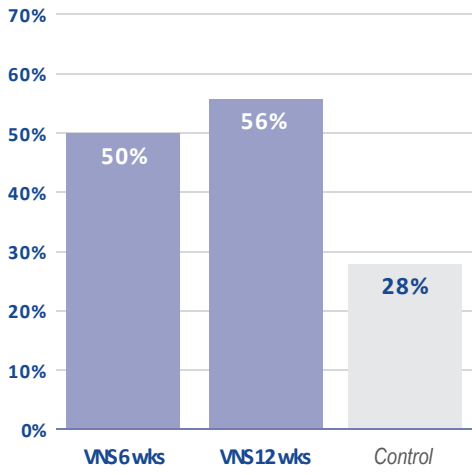
How MicroTransponder Knows It Works: Tinnitus

Primary Efficacy



Median THI (%) Change During Trial

THI Responder Rate



THI – Tinnitus Handicap Inventory, the gold standard of measuring the severity of a patient's tinnitus. 20% or greater change is considered clinically meaningful (responders)

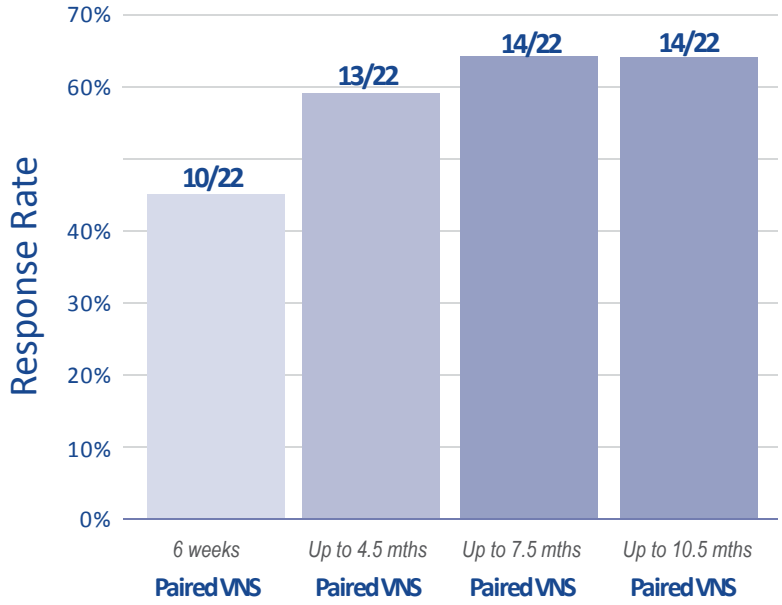
- *56% of Patients Responded to the Therapy*
- *Highly Motivated Patients*
  96% Compliance with Therapy (n=30)
- *Difficult to Treat*
  Average patient had tried 4 other treatments and had tinnitus for 18 years
- *"We have patients reporting big changes in their lives as the result of this therapy."*
  Richard Tyler, Ph.D.
  Professor, Otolaryngology at the University of Iowa

Tinnitus Study

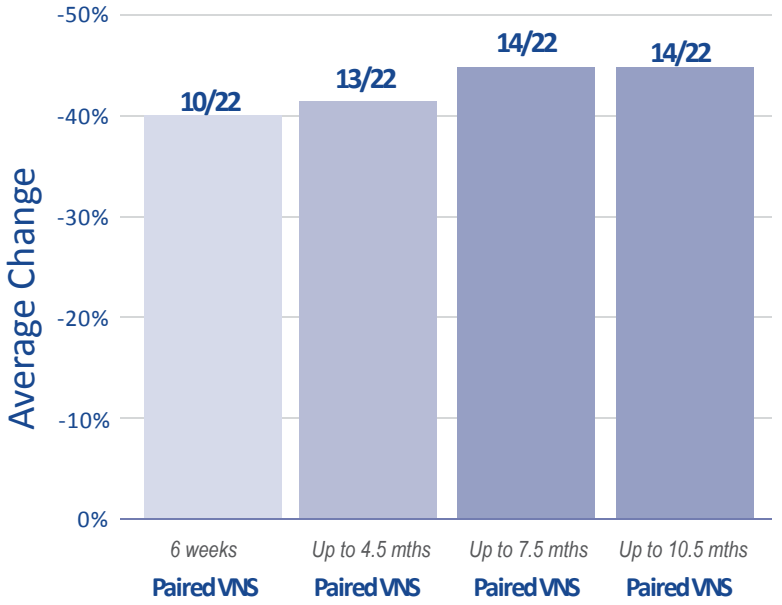
Long-Term Efficacy for more severe patients (>38% in THI)

22/30 patients had moderate or greater tinnitus at baseline (10 moderate, 8 severe, 4 catastrophic)

THI Responders Rate 20% or greater change for moderate or greater tinnitus



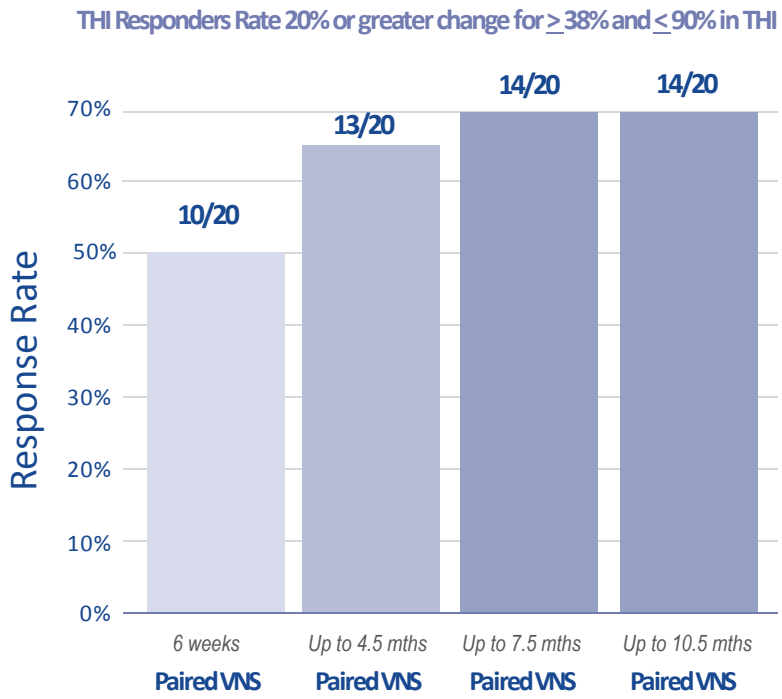
THI % Average Change for moderate or greater tinnitus responders

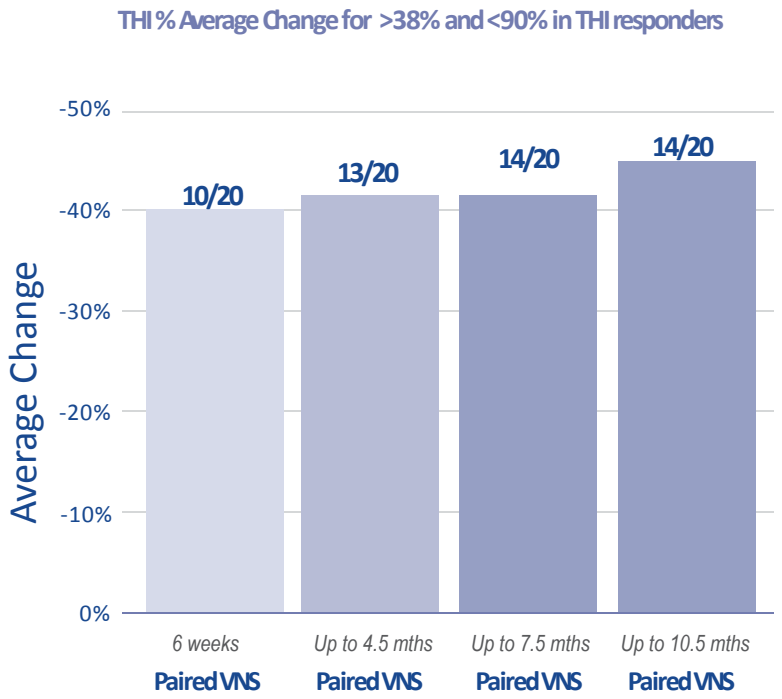


Target Population

Long-Term Efficacy for more severe patients (≥ 38% and ≤ 90% in THI)

20/30 patients were in this THI range (10 moderate, 8 severe, 2 catastrophic)





Why This Matters

Case Study Patient

Click to Play

Status

- *6 issued U.S. patents, 21 pending or allowed, with 267 unique claims.*
- *System development complete.*
- *2nd stroke trial completes enrollment in Q2 2016 with a CE mark expected in Q1 2017.*
- *CE mark in Q3 2016 for tinnitus.*
- *Favorable reimbursement codes exist. (EU $14,500 / U.S. $27,500). The cost of the system will be ~ $5,000 (82% U.S. Profit Margin).*
- *U.S. pivotal trials for both tinnitus and stroke planned for Q4 2016.*
- *FDA has approved the Investigational Device Extension (IDE) for a 120 patient pivotal study in tinnitus.*

267 Unique Claims

European Sales Launch Strategy

VP of Sales and Marketing - EU
Jean-Philippe Allar

- *Led Cyberonic's European VNS Sales for 10 years*
- *VP of Sales for Neurotech, selling VNS devices for another 2 years, ending in 2012*
- *25 years of medical device sales in Europe, great clinical contacts and reimbursement expertise*

Germany

Established Reimbursement

Initial Launch Market

Management Team

Frank McEachern, J.D.
CEO

- Attorney at BakerBotts LLP, including St. Jude / ANS merger
- Business and Law degrees from the University of Texas at Austin
- Significant experience with medical device regulation, reimbursement, outsourcing arrangements, and IP matters

Jordan Curnes, M.B.A.
President and COO

- Co-founder, prior health care consulting expertise
- M.B.A. from Duke University,
- Finance degree from Notre Dame
- Co-founder, prior health care

Navzer Engineer, M.D., Ph.D.
CSO and VP of Medical Affairs

- Expert in neurostimulation procedures and published papers in Nature

Brent Tarver
VP of Clinical Affairs

- Clinical Director at CYBX for 15 years
- Supervised 17 device trials in 8 countries
- Specific previous experience with VNS therapy for treatment of epilepsy and depression

Ravi Jain, M.S.
Director of Engineering

- Experience at St. Jude on both implantable pulse generator (IPG) and lead development
- Responsible for the vagus nerve cuff lead design and production

Jean-Philippe Allar
VP of Sales & Marketing Europe

- European General Manager at Cyberonics for 10 years
- Previous experience at Neurotech and Apnex Medical, both neuromodulation startups

Valuation Framework: Initial Public Offerings (IPOs)

Market data as of April 1, 2015

	Indication	Dev. Stage @IPO	IPO Pricing	IPO Date	Market Cap
nevro	**Back Pain** *Neurostim*	Post CE Mark Pre FDA Approval	Raised $145M IPO @ $523M	Nov 2014	$1.72 BLN
MAINSTAY MEDICAL	**Back Pain** *Neurostim*	26 patients Pre FDA Approval	Raised $25M IPO @ $108M	Apr 2014	$72.4 M
Second Sight	**Vision Restoration** *Neurostim*	Humanitarian Device Exemption	Raised $32M IPO @ $326 M	Nov 2014	$170.5 M
AurisMedical	**Tinnitus** *Drug*	248 patients, Phase II	Raised $56.4M IPO @ $140 M	Aug 2014	$130.5 M
OTONOMY	**Tinnitus** *Drug*	532 patients, Phase III	Raised $115M IPO @ $888 M	Aug 2014	$450.7 M

Valuation Framework: Transactions

		Valuation	Amount Raised			
MicroTransponder	2015	$____	$____	20 stroke patients EU 40 tinnitus patients US/EU		Stroke
saluda MEDICAL	2015	N/A	$10M	80 patients US		Backpain
IMTHERA	2011	$60M	$16M	14 patients EU		Sleep Apnea
NEUROPACE	2011	$100M	$50M	30 patients EU and US		Epilepsy

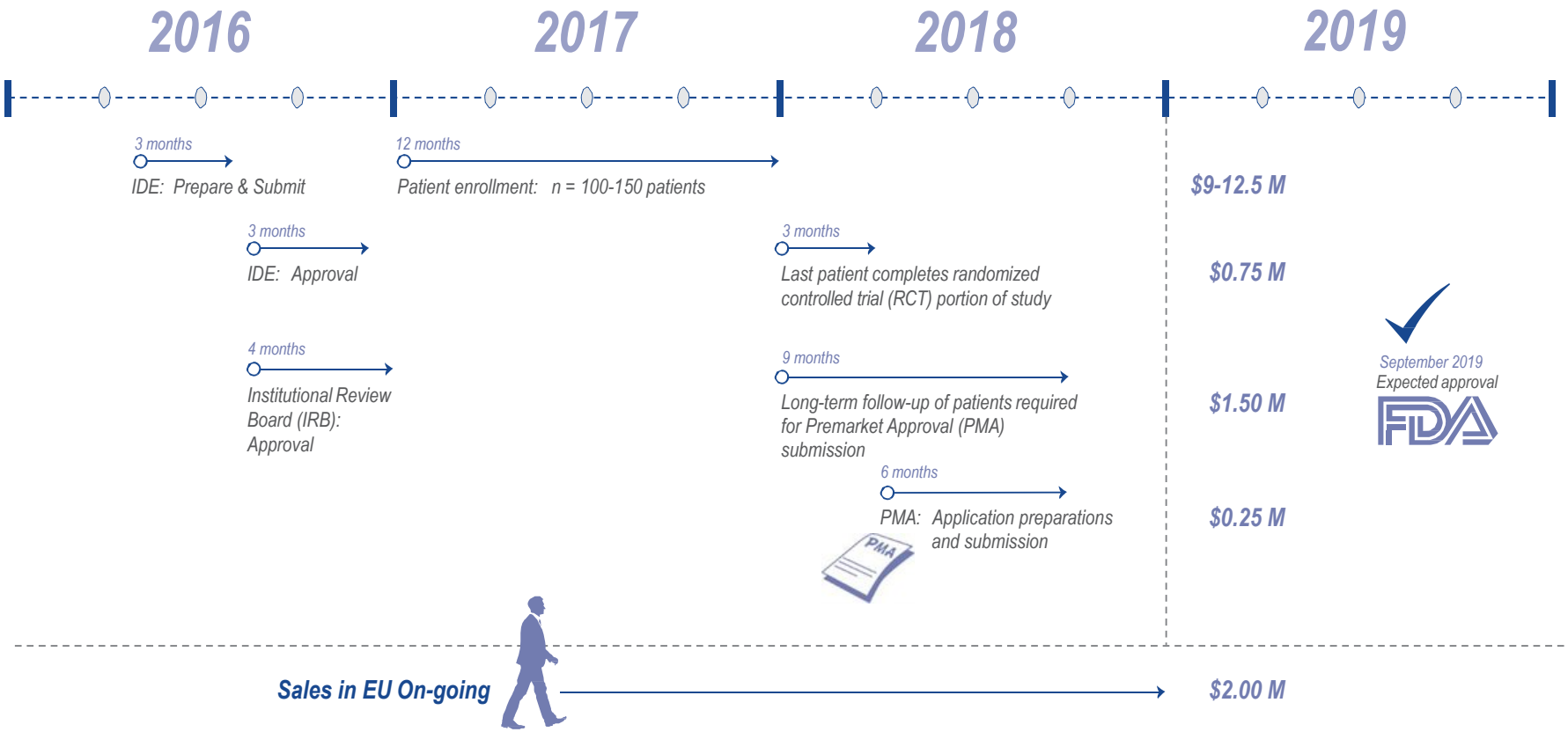
Neurostimulation: Valuation Framework

		Valuation	Amount Raised			
MicroTransponder	2015	$____	$____	20 stroke patients EU 40 tinnitus patients US/EU		Stroke
AUTONOMIC TECHNOLOGIES	2015	$130M	$32M Raised	100 headache patients US		Headache
AxonIcs	2014	N/A	$33M Raised	0 patients US		Urinary Incontinence
SetPoint MEDICAL	2013	N/A	$27M Raised	8 patients US		Rheumatoid Arthritis
nevro	2011	$120M	$58M	24 patients US 70 patients EU		Backpain
Spinal Modulation	2009	$70M	$30M	10 patients US		Backpain

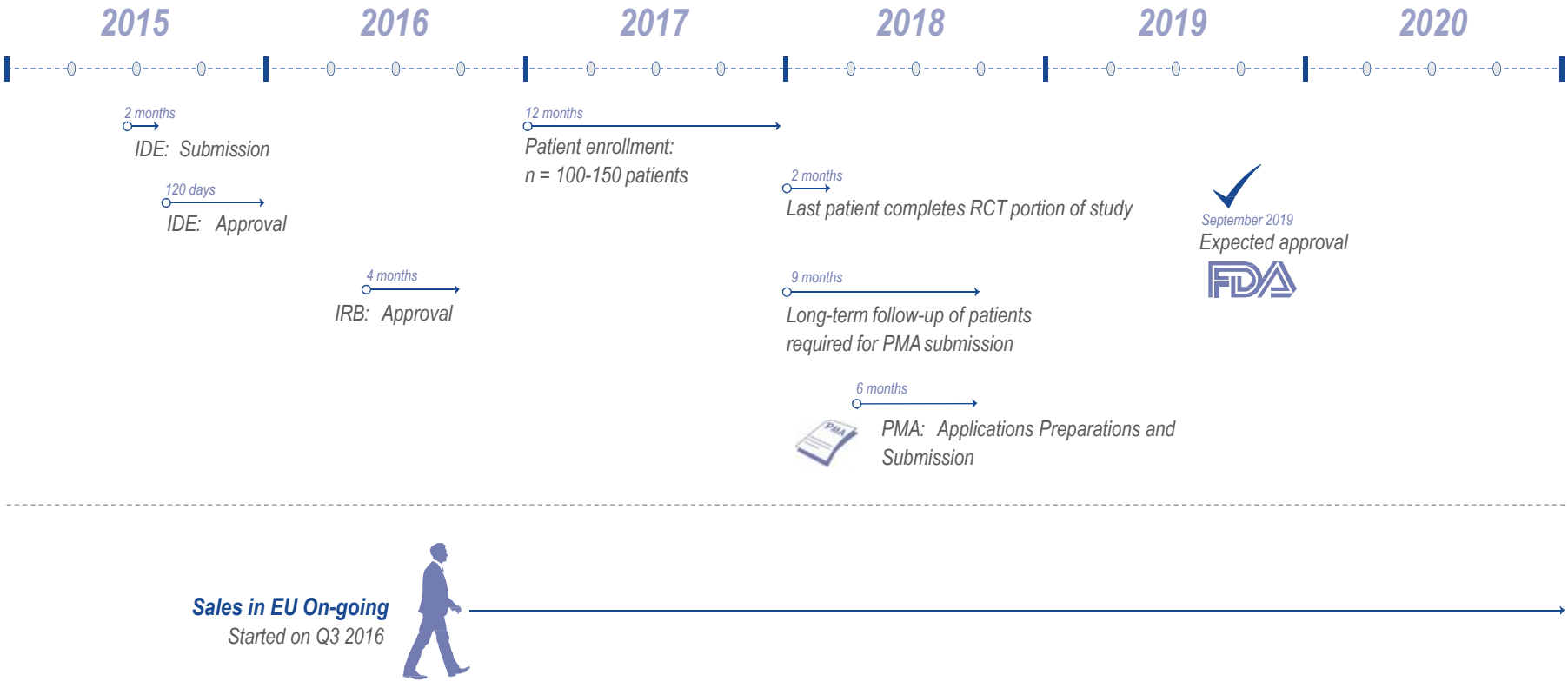
Potential Acquirers

Cochlear	**Cochlear Implant (CI) Leader** *2013 CI Revenue was $646M Great relationships with key opinion leaders in space*	**Expertise in Hearing** *Same physician call points, MicroTransponder (MTI) would be a tuck-in acquisition*
sonova	**Cochlear Implant - Emerging Competitor** *2013 Cochlear Implant Revenue was $218M, 33% increase* *Trying to grow their neurostim presence*	**Dedicated Hearing Aid Player** *Committed to broader hearing issues* *MTI would be a tuck-in acquisition*
Medtronic When Life Depends on Medical Technology	**Dominant Neurostim Leader** *Estimated $8B in Cash, $1.8B rev.* *Leaders in Pain, Urinary Incontinence, DBS space*	**Same Call Points** *Needs growth, and VNS lead* *Sales force understands IPGs, Already sells to Ear, Nose, and Throat (ENT) specialists*
stryker®	**Ischemic Stroke, Interest in Neurostim** *Already bought BSX Neurovascular, Concentric Medical* *Long held interest in neurostimulation space*	**Stroke Experience** *Call points with stroke docs* *Great device sales force*
Boston Scientific	**Large Neurostim with VNS Research** *$550M in revenues* *Previous VNS research for cardiac*	**VNS Research** *Sales Reps familiar with IPG* *Expanding indications*
Cyberonics	**Largest VNS Company** *$292M in revenues* *Recently expanded focus beyond epilepsy*	**VNS Expertise** *Easy tuck-in acquisition* *Sales force fully understands surgery*

Pivotal Trial Timelines: Stroke ($13.5 - $17.0 M)



Tinnitus: Path to the U.S. Market

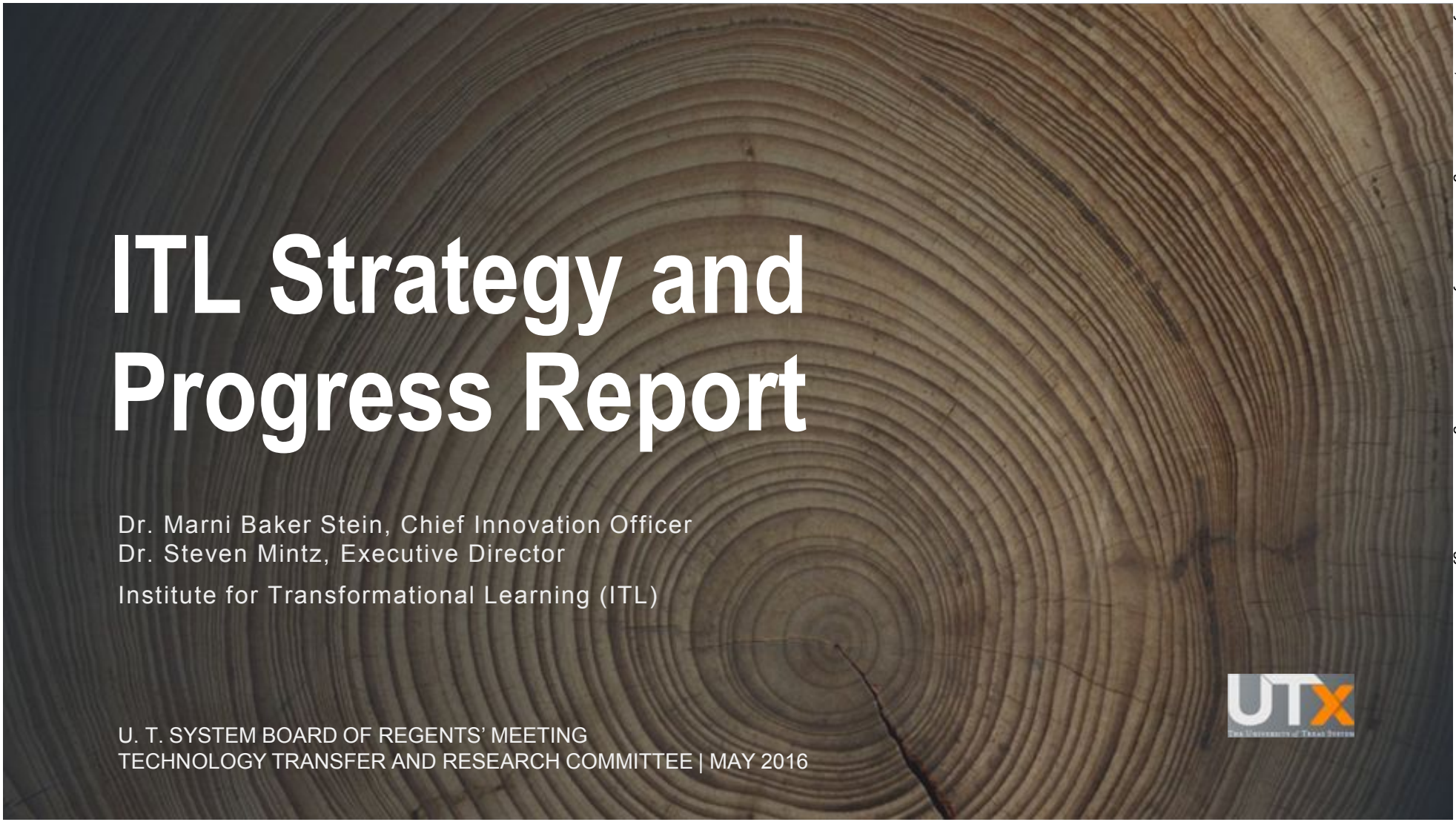


4. U. T. System: Report and discussion on the initiatives of the Institute for Transformational Learning

REPORT

Dr. Steven Mintz, Executive Director of the U. T. System Institute for Transformational Learning (ITL), and Dr. Marni Baker Stein, Chief Innovation Officer, will provide a report on the initiatives of the ITL.

A PowerPoint presentation is set forth on the following pages.



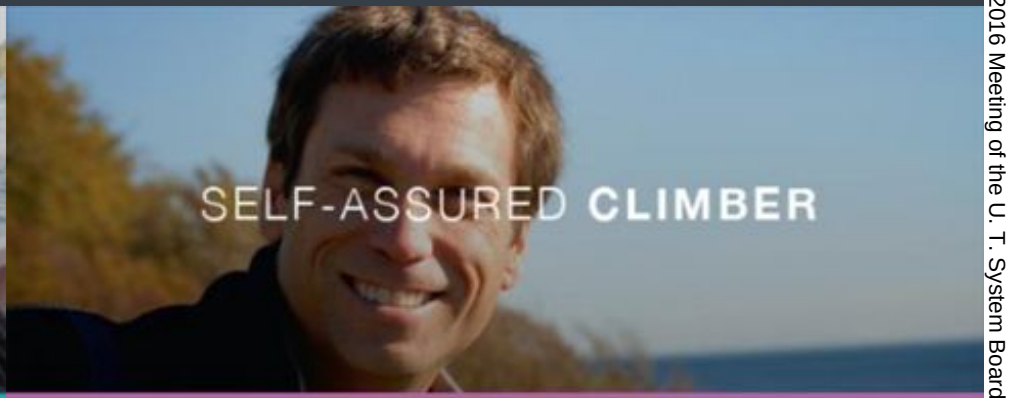
ITL Strategy and Progress Report

Dr. Marni Baker Stein, Chief Innovation Officer
Dr. Steven Mintz, Executive Director

Institute for Transformational Learning (ITL)

U. T. SYSTEM BOARD OF REGENTS' MEETING
TECHNOLOGY TRANSFER AND RESEARCH COMMITTEE | MAY 2016

THE NEW STUDENT PROFILE

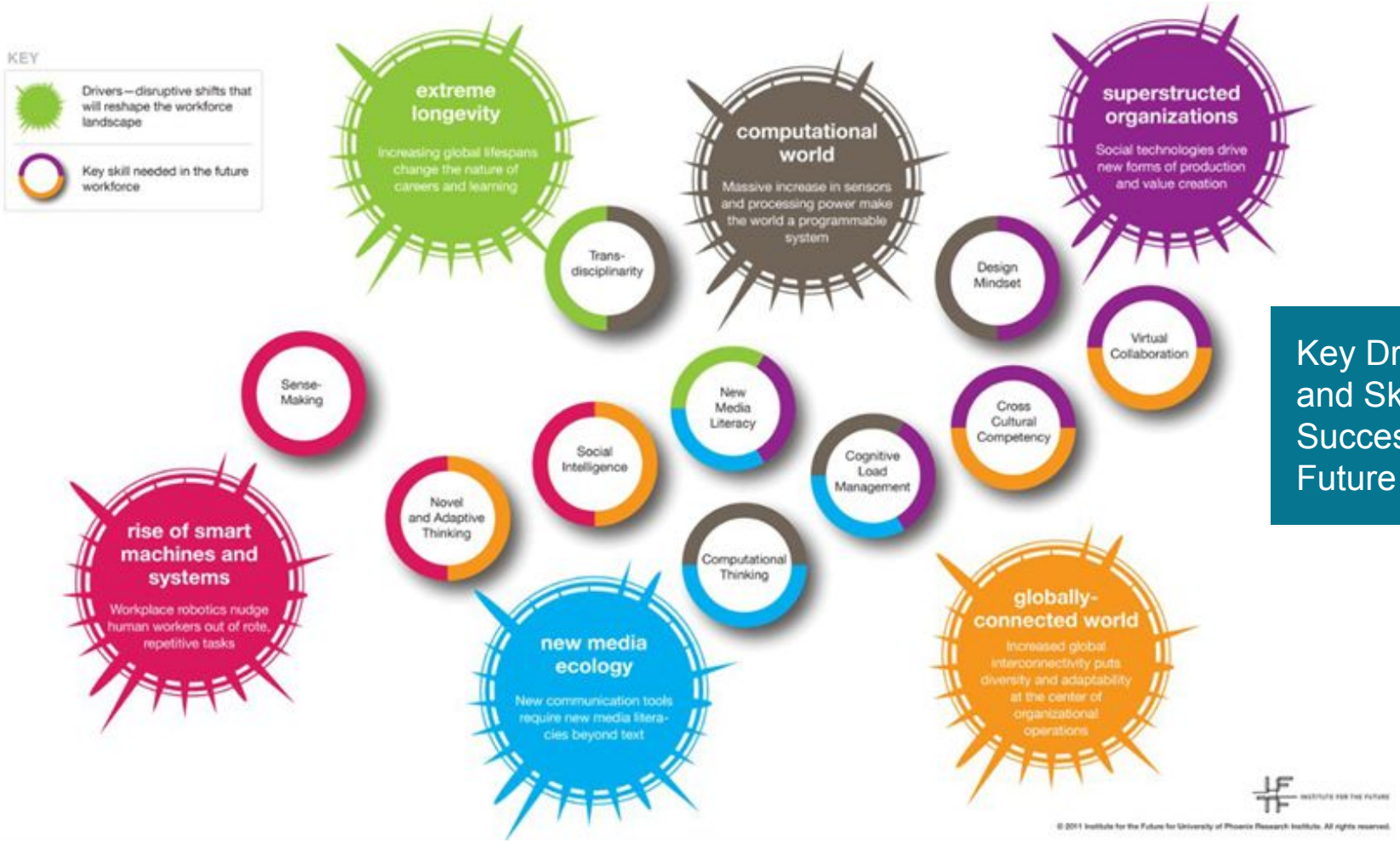


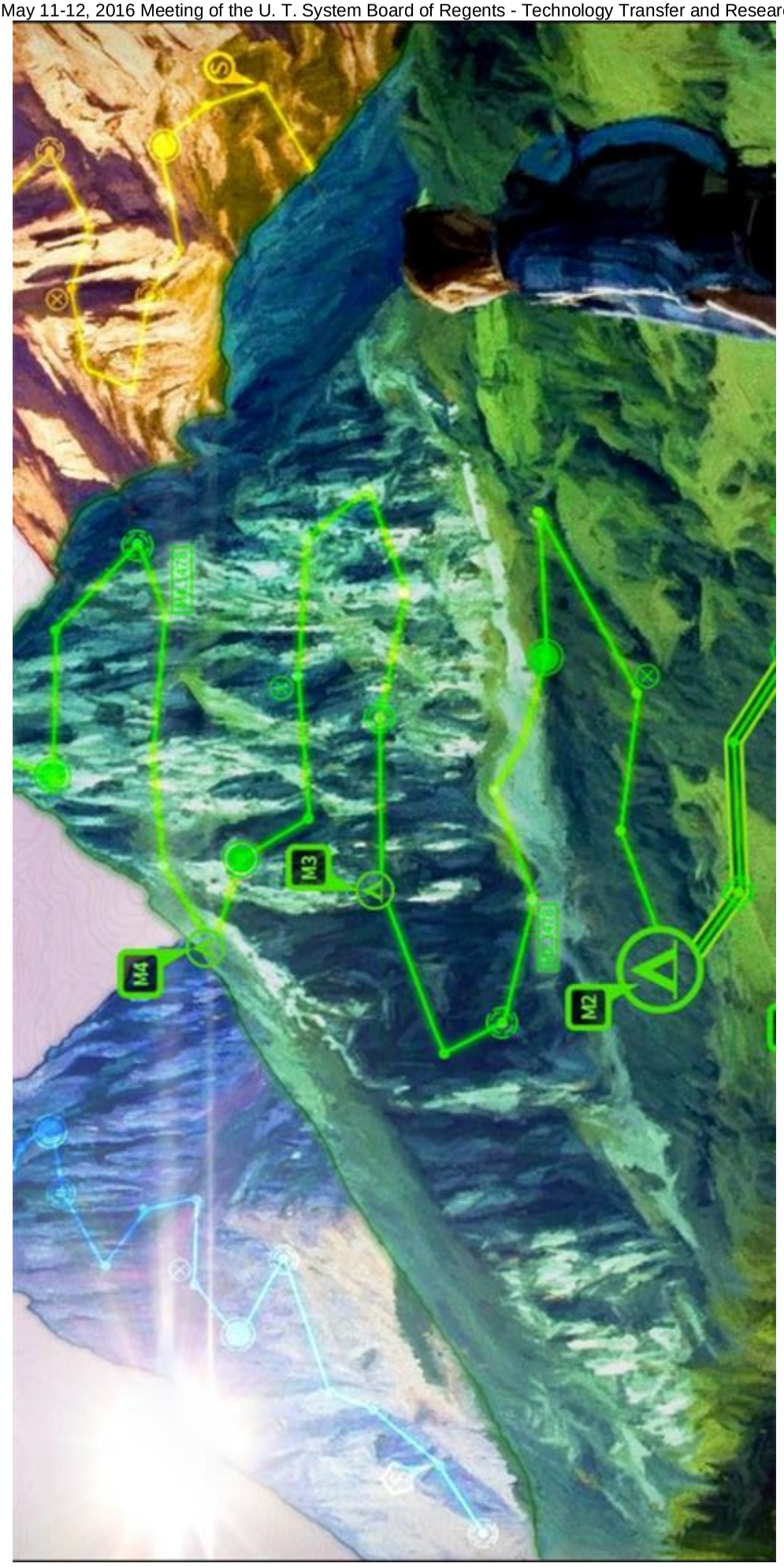
UTx

IT'S A **VUCA** WORLD

Volatile
Uncertain
Complex
Ambiguous

Key Drivers and Skills for Success in the Future of Work



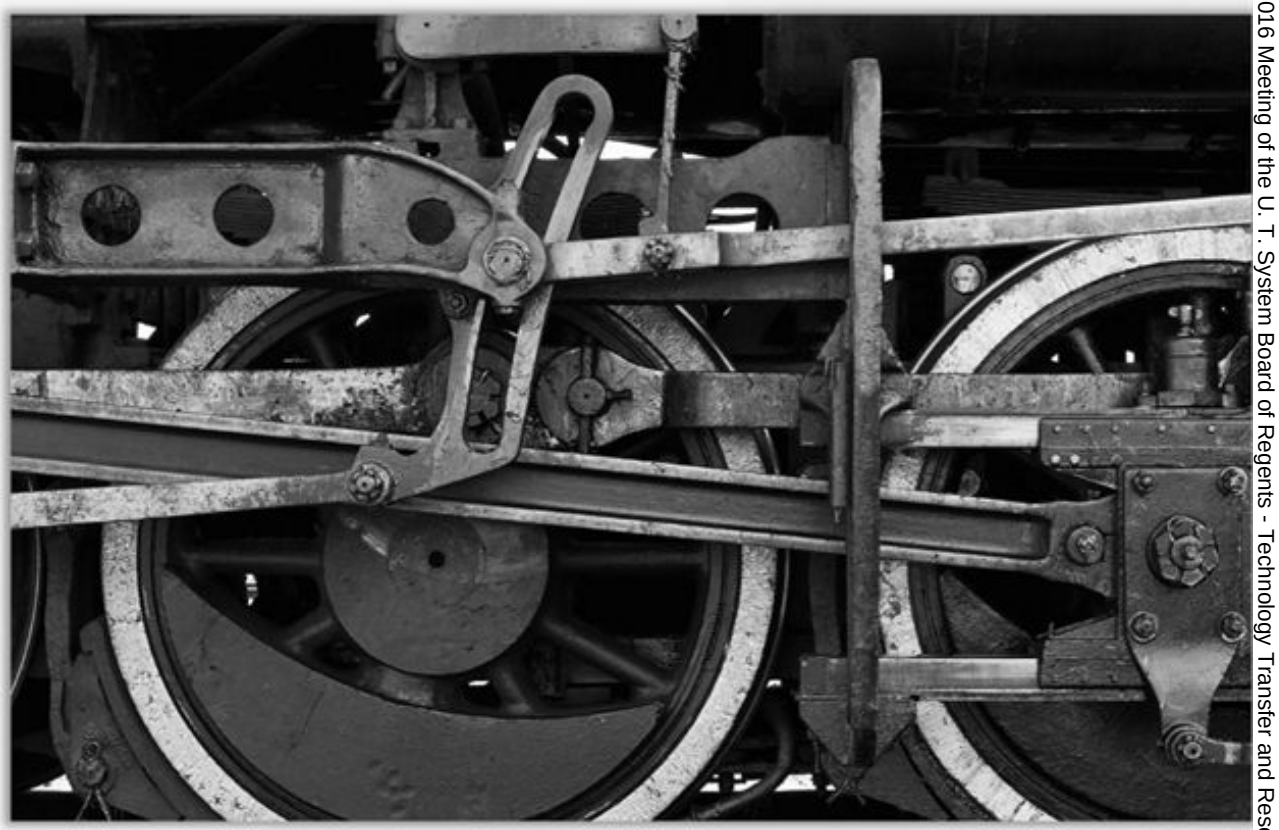

M4
M3
M2

Why can’t we get more learners to this bright future?

“

We are in a new world, using old tools

– Thomas Friedman,
“The World is Flat”



Design Requirements PART 1

CONTINUOUS | Programming pathways that begin as early as middle school and continue throughout a career

TRANSDISCIPLINARY | Programming pathways that encourage learners to move beyond disciplinary-specific approaches as they address critical problems and opportunities

INDUSTRY-ALIGNED | Programming pathways that are laser focused on the future of work and assume (by design) multiple entry and exit points across a life time

Hi-FIDELITY CONTENT | Curate and develop compelling content that delivers high impact pedagogical approaches (has to look good and work)

Design Requirements PART 2

STUDENT-CENTERED and PERSONALIZED | Provide students persistent and progressive lifecycle management, learning, career, and content services

GAMIFIED | Offer learning activities designed for high engagement and tangible progression

SOCIAL | Encourage knowledge networking experiences that are contextualized and designed to drive value

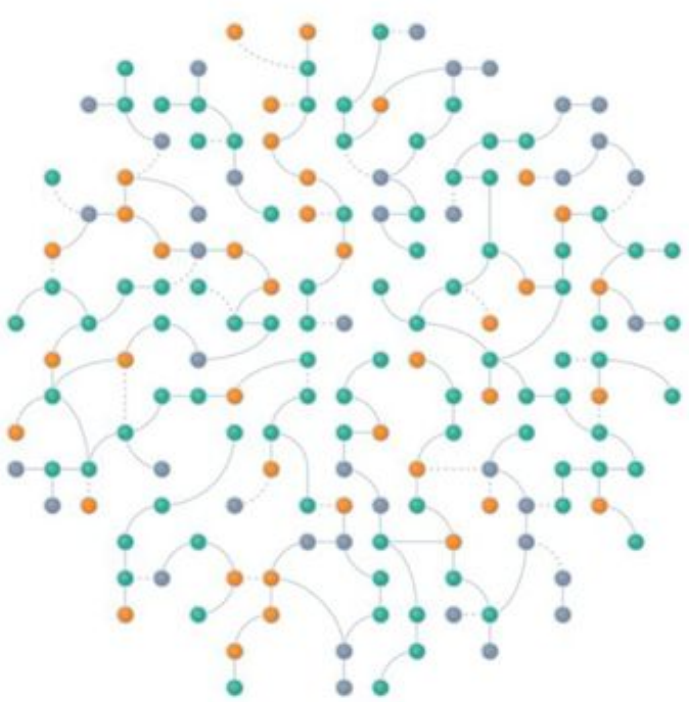
ATOMIC | Modularized, stackable learning experiences that tag to a wide range of accomplishments from badge to competency to credit to certificate or degree (potentially across multiple institutions or kiosks)

TEx

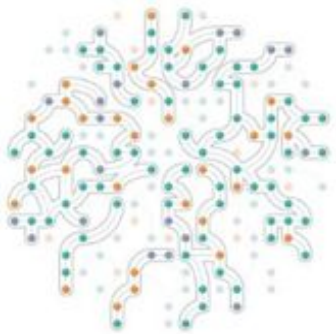
Total Educational Experience

A Persistent Progressive Profile and Universal Transcript

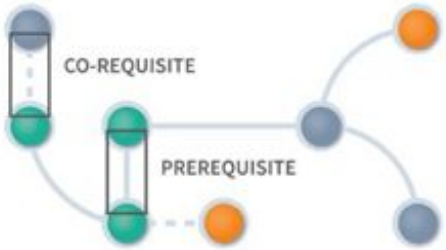
The Knowledge Graph



Certificate

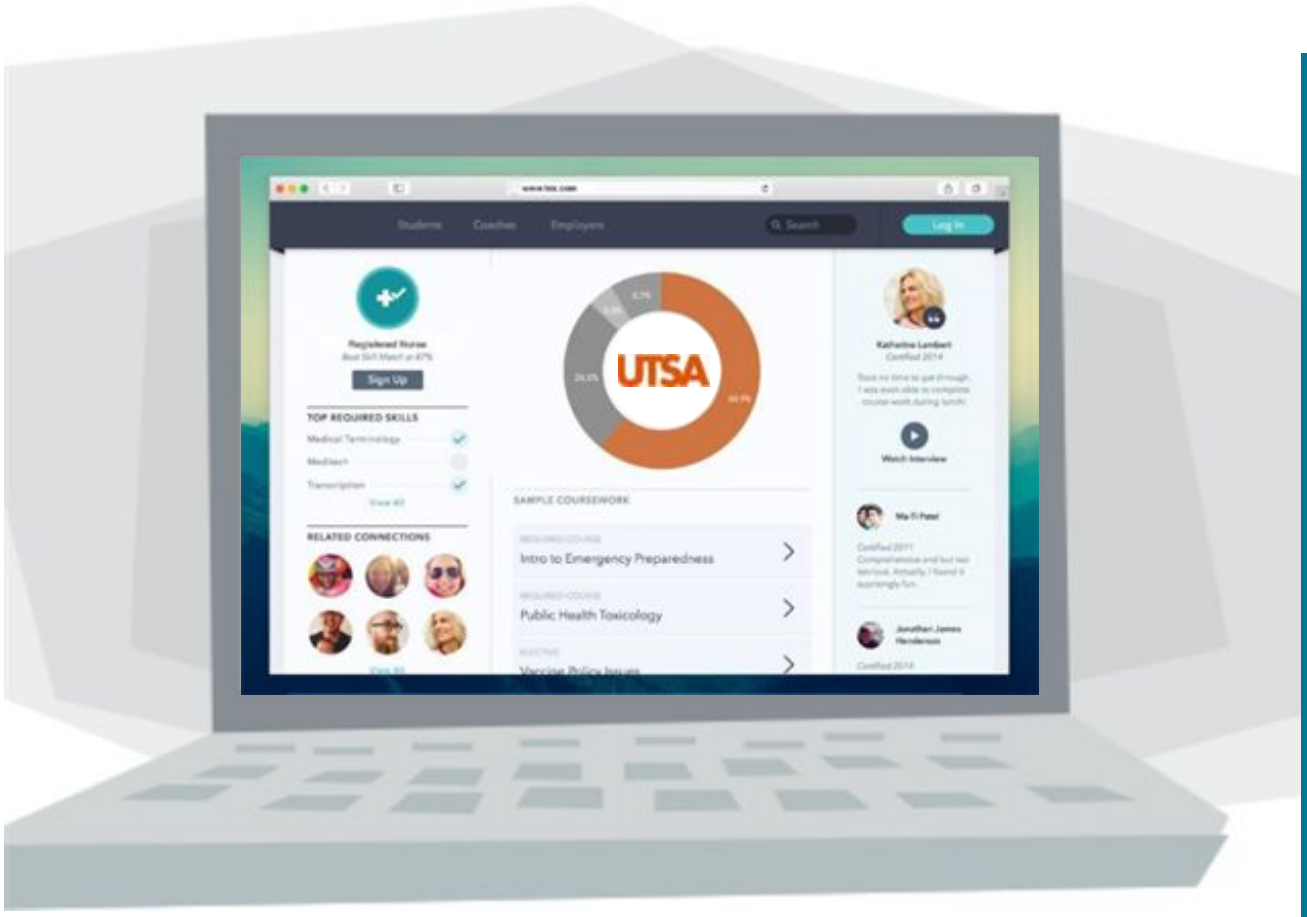


Degree



UTx

The Learning Environment



The Marketplace

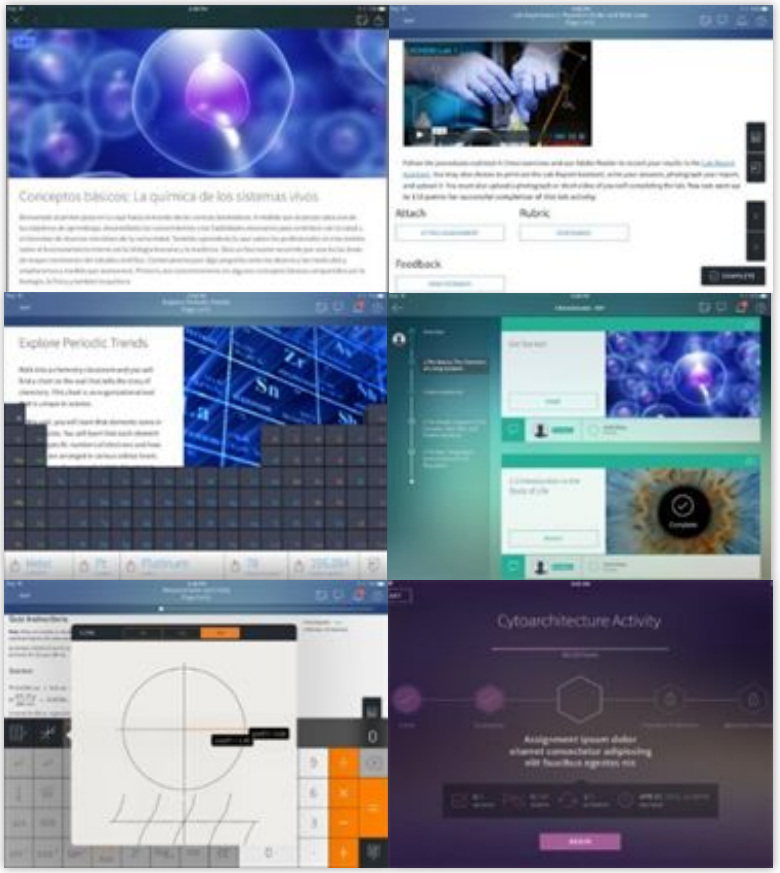
THE PROTOTYPE

BS in Biomedical Sciences

THE PROTOTYPE : **BS IN BIOMEDICAL SCIENCES**

High fidelity content and learning experiences that engage students and compete for attention in a complex world:

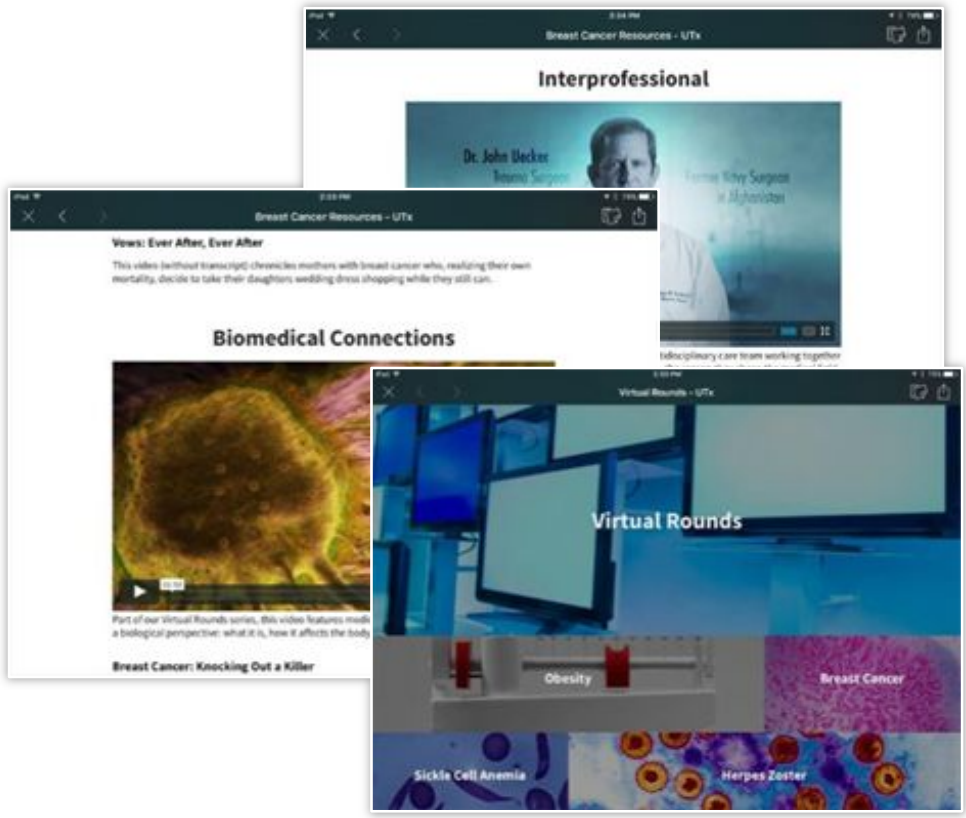
- Mobile-first approach
- Pre-loaded content
- Bilingual content and Offline content
- High impact pedagogies and authentic assessment
- Distributed activity framework (atomic design)
- Points-driven progress indicators



THE PROTOTYPE : **BS IN BIOMEDICAL SCIENCES**

Transdisciplinary insights and windows into the health professions:

- Design across all 120 credit requirements
- Synergistic learning pathways across each term
- Virtual rounds as red thread across disciplinary domains



THE PROTOTYPE : **BS IN BIOMEDICAL SCIENCES**

A level of personalization to support a diverse audience of learners:

Personalization of pace (bounded)

Block scheduling

Pre-set pathways

and…

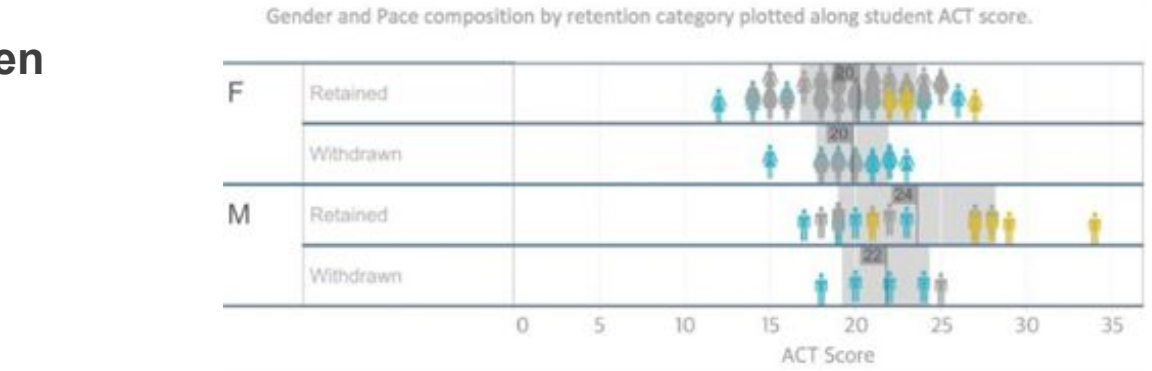
UTx

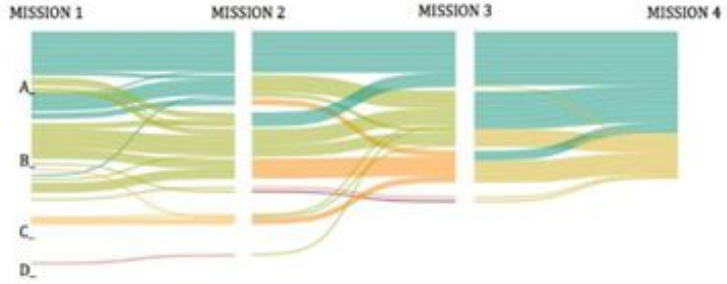
A community of care acting on real time engagement and performance data (2.3 million events in term one):

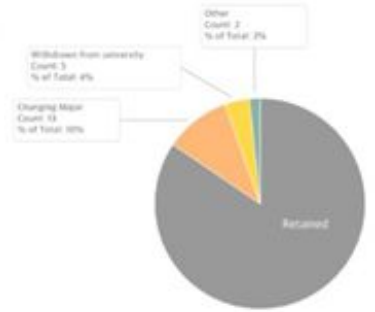
- Faculty
- Longitudinal Instructional Facilitators
- Student Lifecycle Management Coaching (proactive and reactive)
- Dedicated Student Success Coach
- Tutoring Services

A commitment to evidence-driven continuous improvement:

- Profile
- Engagement
- Self-efficacy
- Endurance
- Learning decay
- Intervention impacts
- Outcomes







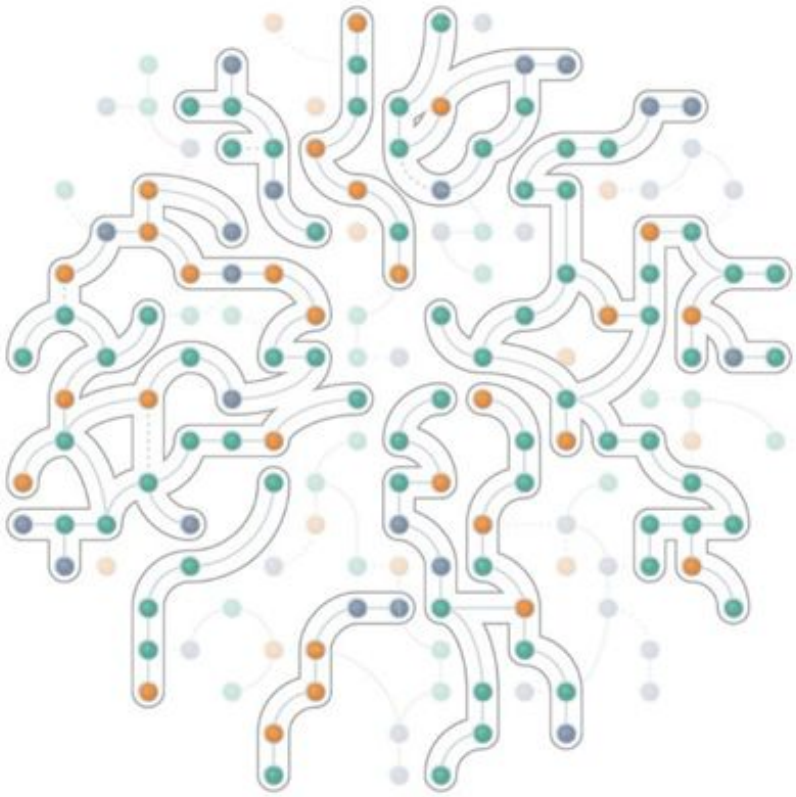
THE EMERGING PARTNERSHIP LANDSCAPE

The Gates Foundation
The Teagle Foundation
The Department of Education
Apple
Salesforce
PBS
Dell Corporate Giving

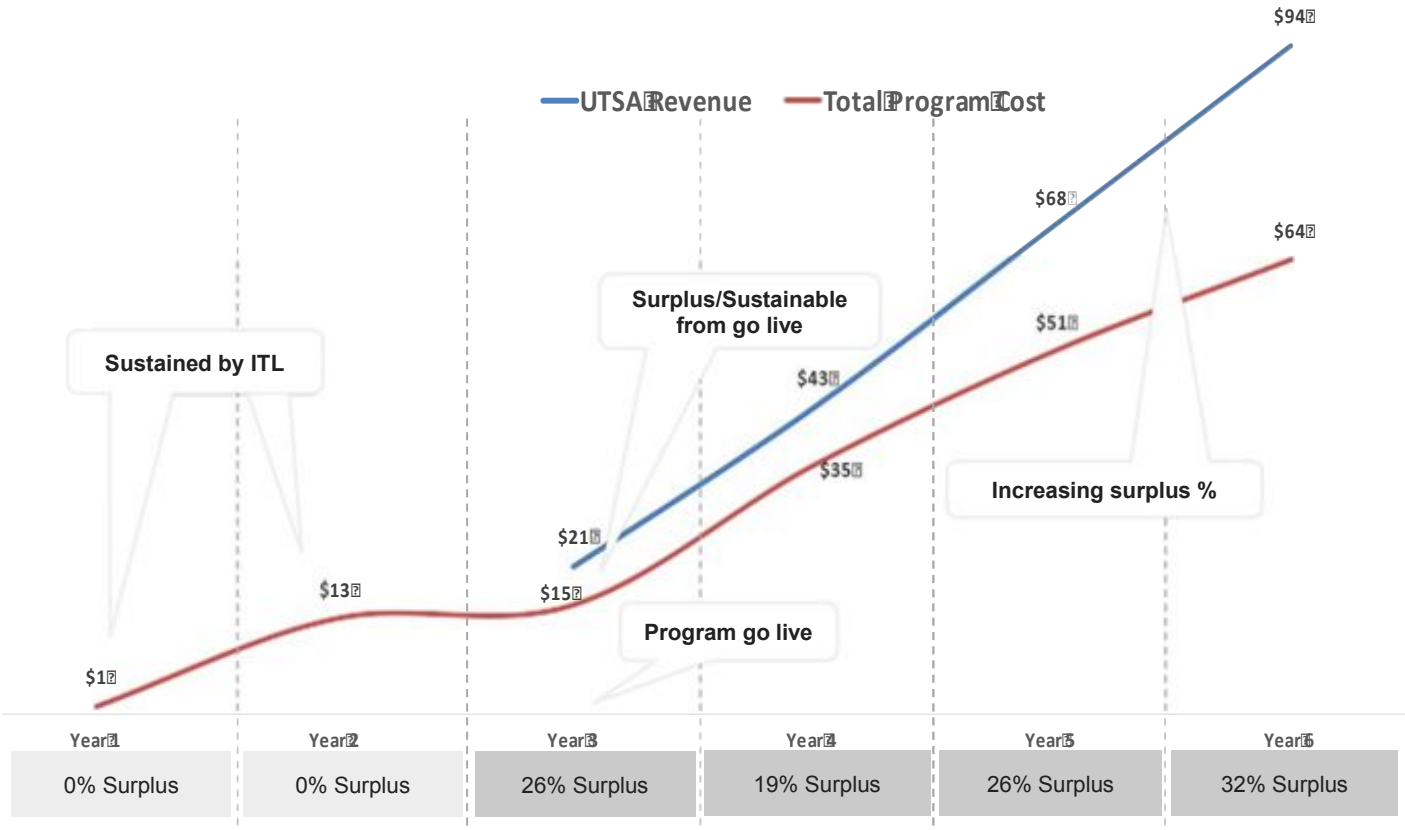
Is this model sustainable – and can we get it to scale?

UTSA CYBER PORTFOLIO

- BA in Computer Science
- BBA in Information Systems and Cyber Security
- Multiple Academic Certificates
- Multiple professional/non-credit Certificates
- Credit by exam

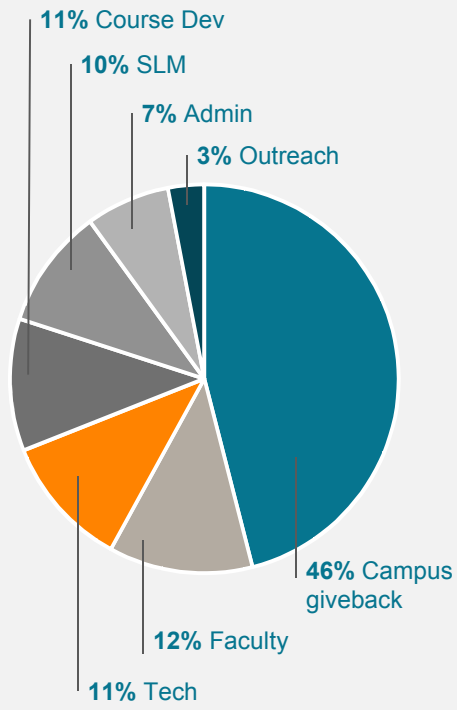


Total UTSA Program Revenue and Cost ($m)

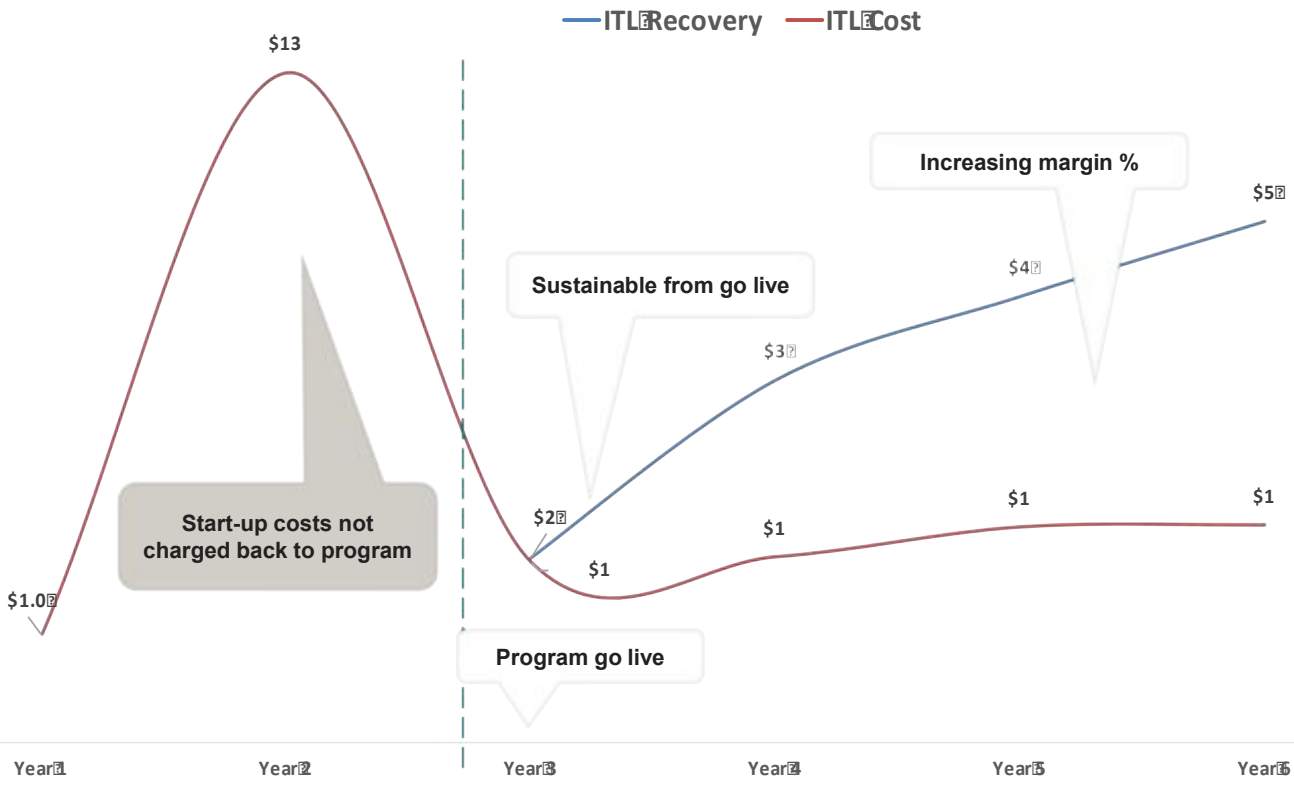


* Assumes no recovery for initial start-up funds incurred by ITL

Average Cost Breakdown by Type for Program



ITL Support for UTSA Program - Recovery and Cost ($m)



- Assumes ITL will not chargeback any initial program creation costs
- Some recovery can be built into these surplus programs
- ITL costs relate to program are for headcount and program management
- All ITL related costs are recovered at go live

BUSINESS

U. T. San Antonio - BBA Cyber Security and Early Business Core (Fall 2017)

U. T. Tyler - BS Marketing (concept stage)

HEALTH PROFESSIONS

U. T. Rio Grande Valley - BS in Biomedical Sciences (Live – Fall 2015)

U. T. Health Science Center - Houston - Biostatistics Pathway (Fall 2016)

TIME Initiative - Early Health Sciences Core (concept stage)

U. T. M. D. Anderson Cancer Center - Cross Institutional UTxHealth Continuing and Professional Education Portfolio (Fall 2017)

COMPUTER SCIENCE

U. T. San Antonio - BA Cyber Security and Early Computer Science Core (Fall 2017)

ENGINEERING

U. T. El Paso - BS Electrical (concept stage)

U. T. Permian Basin - BS Petroleum and Energy Technology (concept stage)

U. T. Austin - Early Engineering (Fall 2017)

MEDICAL SCHOOL

U. T. Rio Grande Valley - Competency Based Degree Mapping (complete – Fall 2015)

U. T. Austin - Competency Based Degree Mapping (complete – Spring 2015)

U. T. Austin - Value Based Care Metrics (Spring 2016)

What is the real measure of success?

Value Metrics

STUDENT ACCESS

STUDENT SUCCESS

CROSS-INSTITUTIONAL IMPACT

Programs in Development

Programs Live

STAKEHOLDER VALUE

Annual Earnings to Partners

Annual Earnings to ITL

STAKEHOLDER SATISFACTION

Campus Leadership ★★★★★

Faculty ★★★★★

Students ★★★★★

UTx

Value Metrics

SCALABILITY

	2015	2016
Program Growth	Partner Partner	Partner
Affiliate Partners	Partner Partner Partner	Partner Partner Partner Partner

DIFFUSION OF INNOVATION

- Requests for New Program Development
- Requests for Consultation
- Proliferation of Models Beyond ITL

INTELLECTUAL CAPITAL

- Data Attributes
- Research Initiatives
- Publications
- IP

REPUTATIONAL CAPITAL

	2015	2016
Foundation Partners	Partner Partner	Partner Partner Partner
Industry Partners	Partner Partner Partner	Partner Partner Partner Partner
Non-Profit Partners	Partner Partner	Partner Partner

UTx