

Utah's Technology Catalyst: USTAR



USTAR

Ivy Estabrooke, Ph.D., Executive Director

USTAR VISION & MISSION

Utah Vision: Utah will lead the nation as the best performing economy and be recognized as a premier global business destination

USTAR Vision: Build a robust innovation ecosystem in the State of Utah

USTAR Mission: Accelerate the commercialization of science and technology ideas generated from the private sector, entrepreneurs, and university researchers in order to positively elevate tax revenue, employment, and corporate retention in the State of Utah

KEY USTAR PRIORITIES

1. Support technology entrepreneurs and innovators through training, funding, incubator, and accelerator programs
2. Broker technology transfer by connecting capital, management, and industry
3. Address market gaps in Utah's technology ecosystem
4. Strengthen Utah research capacity



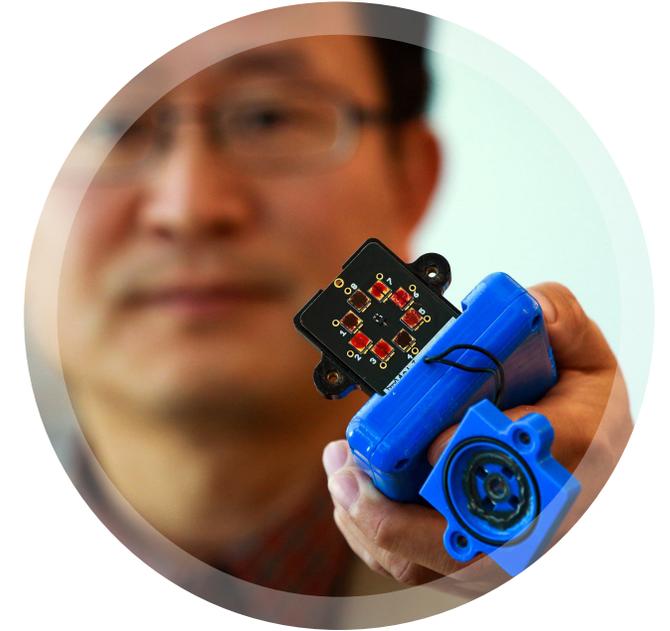
USTAR STATEWIDE PROGRAMS



Competitive Grant
Programs

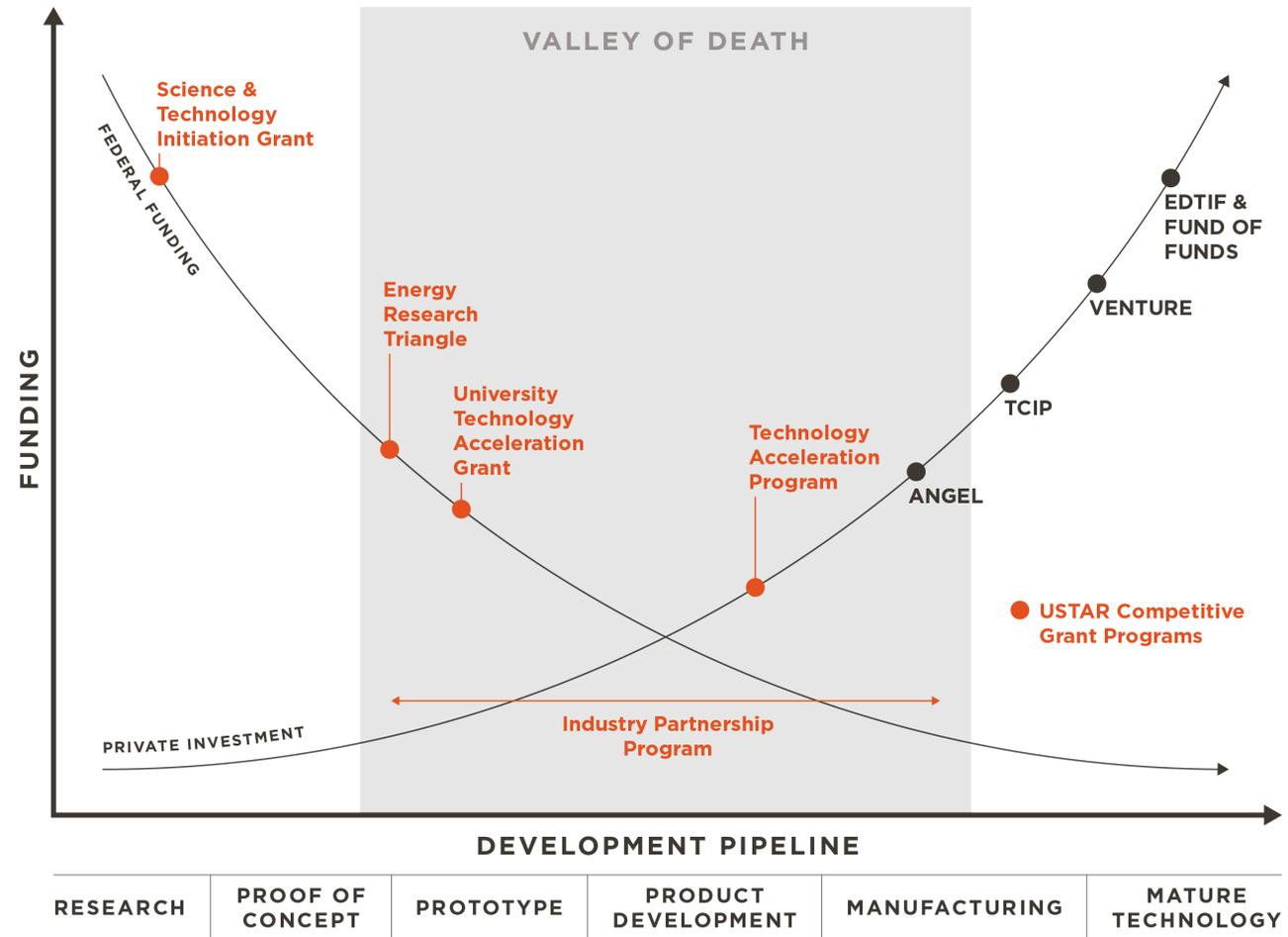


Technology Entrepreneur
Services



Principal
Researchers

TARGETING THE VALLEY OF DEATH

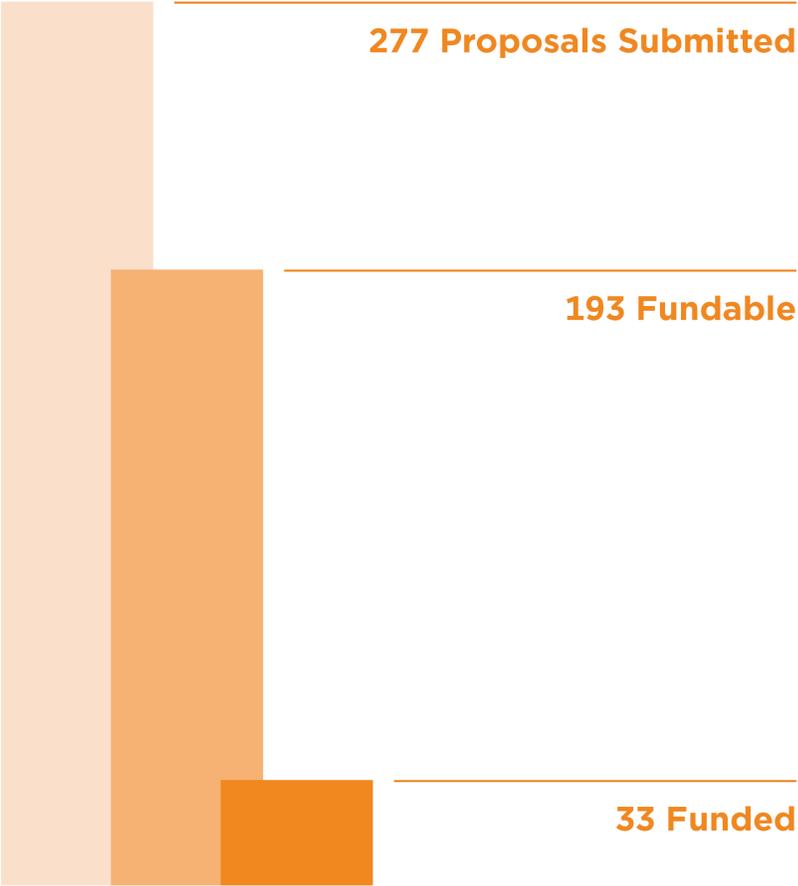


Competitive Grants

COMPETITIVE GRANTS: TAP

Technology Acceleration Program

Accelerates the development of commercially viable technology in emerging companies that is aligned to USTAR target technology areas



COMPETITIVE GRANTS: IPP



Industry Partnership Program

Supports partnerships between private industry and university researchers to address technology problems or gaps identified by the company

Success Story

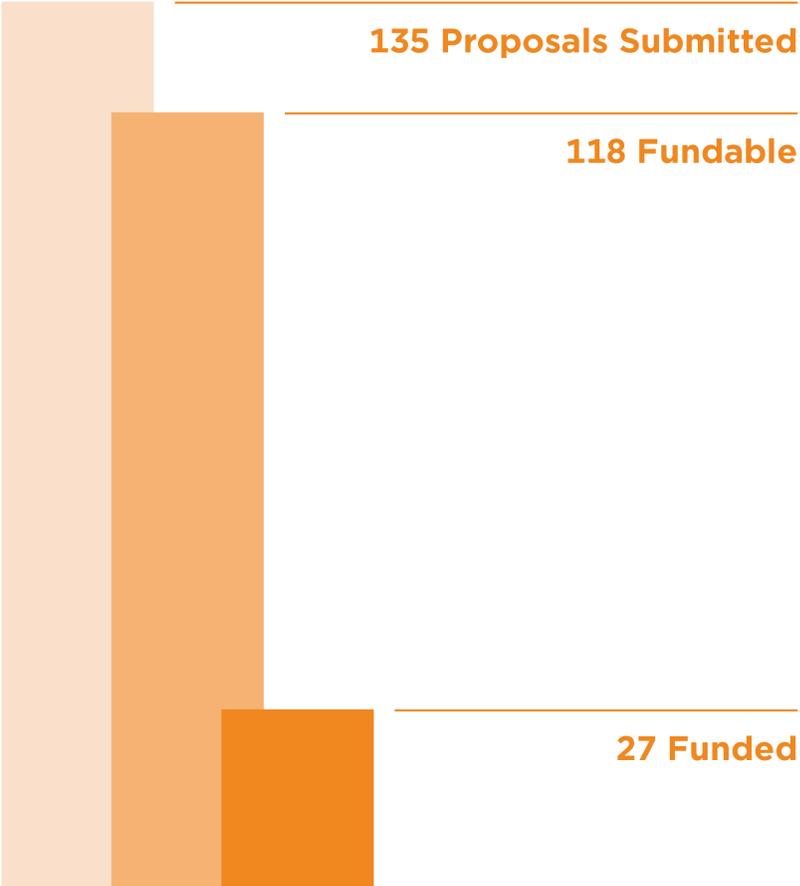
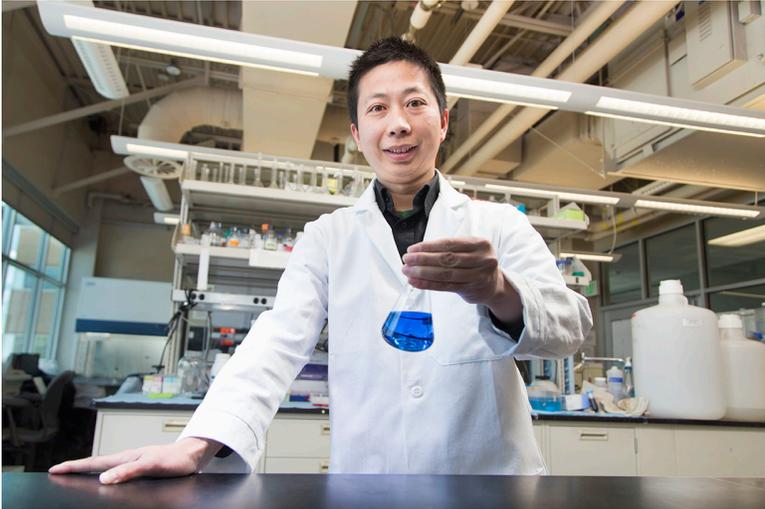
EP Systems & Utah State University



COMPETITIVE GRANTS: UTAG

University Technology Acceleration Grant

Accelerates the development of commercially viable technology aligned to USTAR target technology areas in the university setting



COMPETITIVE GRANTS: ERT & STIG



Energy Research Triangle

Fosters innovation in the development and deployment of energy technologies that address Utah specific challenges



Science & Technology Initiation Grant

Provides competitive funding for multidisciplinary teams for initial experimentation and data generation to compete for large federal R&D grants or industry contracts

Technology Entrepreneur Services

TECHNOLOGY ENTREPRENEUR SERVICES



Resources for startups and emerging companies to successfully launch and grow their companies

Incubation Enterprise

USTAR Innovation Center

BioInnovations Gateway

Utah Nanofab

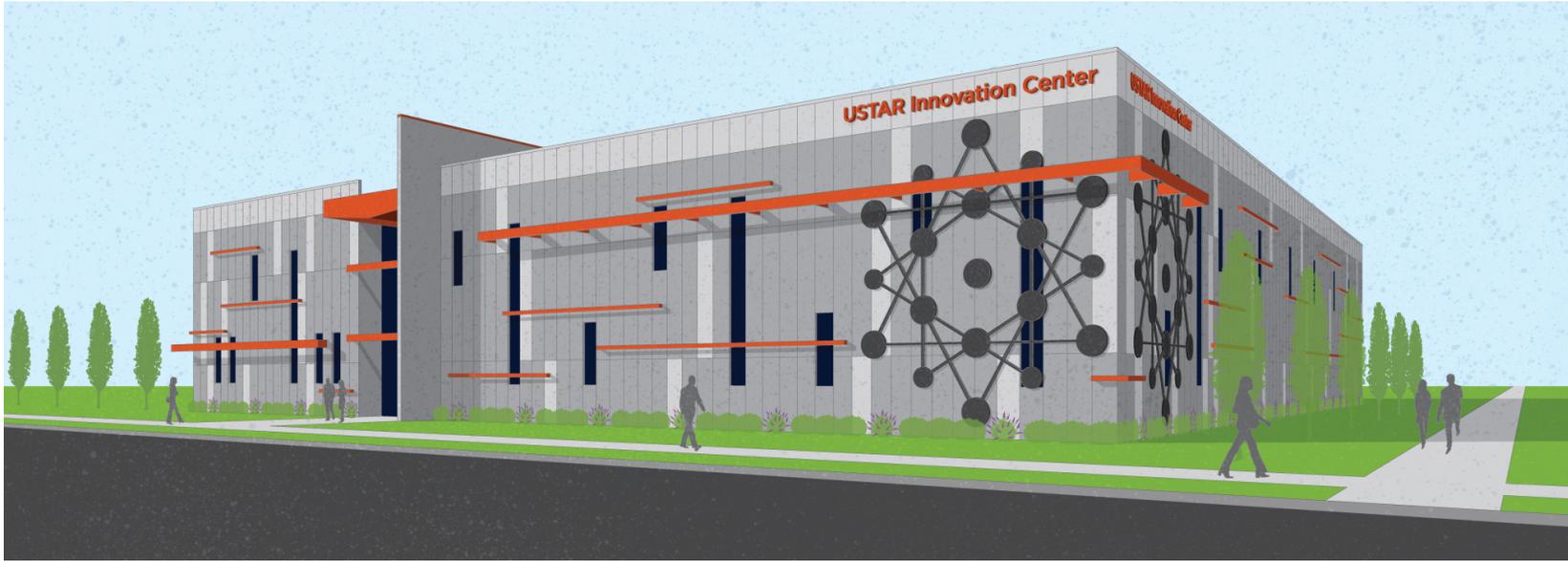
Synthetic Biomanufacturing Facility

SBIR-STTR Assistance Center (SSAC)

Satellite Offices: Orem & St. George



TECHNOLOGY ENTREPRENEUR SERVICES



USTAR Innovation Center

Opening November 3, 2017

Just outside the gates of Hill Air Force Base

TECHNOLOGY ENTREPRENEUR SERVICES



SBIR-STTR Assistance Center (SSAC)

Win rate of 25%, almost twice the national average

Success Story

JSK Therapeutics

JSK

THERAPEUTICS

CHEMISTRY AGAINST CANCER

Impact

IMPACT



Job Growth

USTAR-supported companies added **128 full-time and 90 part-time new jobs** in 2016, up 45% from 2015.

— *TEconomy Partners, LLC*

IMPACT



Follow-on Investment

USTAR-supported companies received over **\$60.5M in follow-on investment** in CY16, more than triple CY15's \$18.3M.

— *TEconomy Partners, LLC*

IMPACT



National Stature

Utah is ranked **#2 in the nation** for increased university R&D funding from 2010–2015. Utah's 30% growth over the five-year period sets it right on the heels of Massachusetts which came in first.

— *National Science Foundation*

IMPACT



Gaining Traction

USTAR's principal researchers at U of U and USU received over **\$28.3M in leveraged research funding** in FY17. This measure of long-term economic development includes federal grants and contracts plus industry, philanthropic, and non-USTAR state funding.

— *University of Utah & Utah State University*

IMPACT



Hitting the Market

USTAR-supported companies generated **\$4.9M in sales from commercialized products** in CY16, an increase from CY15's sales of \$4.3M.

— *TEconomy Partners, LLC*

BEDL H.B. 4 Reporting

ADMINISTRATION: ITEM 21

Metric	Target	FY17	To Date
% USTAR Appropriation used for administration	4%	3.1%	3%*
Unique Visitors to Website	4,000	75,701	22,211
Staff Professional Development	100%	100%**	16%
Confluence (Annual Meeting Attendance)	150	275***	Scheduled for April 18 & 19

*Based on FY18 budget

**Only includes employees that were employed by USTAR more than 9 months of FY17

** Estimate based on registrations

RESEARCH CAPACITY BUILDING: ITEM 22

Metric	Target	Most Recent Data	To Date
% of USTAR Principle Researchers receiving grants*	100%	100% (state FY17)	n/a
Amount of Research and Development funds to universities compared to national average**	> National average	Ranked 27 th , below national average (federal FY15)	n/a

*Includes federal, philanthropic and industry grants

**Most recent data published is from FY2015, limited to federal funding and can only be determined by State not by institution.

GRANT PROGRAMS: ITEM 23

Metric	Target	2016	To Date
Number of "High Quality" jobs created	50	24*	n/a
% of grant recipient companies receiving follow-on investment	50%	86%	n/a
Percentage of grant recipients that introduce new products	50%	7%	n/a

*This number reflects the jobs created from the pilot grant program (N= 12 companies)

SUPPORT PROGRAMS: ITEM 24

Metric	Target	2016	To Date
USTAR assisted companies as portion of all Utah SBIR Grant obligations*	5%	n/a	n/a
USTAR assisted companies as portion of all USTAR awards*	5%	n/a	n/a
Number of "High Quality" jobs created**	50	89	n/a
Number of USTAR client companies assisted**	150	249	n/a
% of client companies receiving follow-on investment**	50%	16%	n/a
Percentage of client companies that introduce new products**	50%	2%	n/a

*Data is not available from all federal agencies on number of applications.

**Companies may have received both services and competitive grants, data here removes the companies that received grants.

NUANCES FOR REPORTING

- USTAR client companies and grantee companies report for five years, by statute, therefore data reflects multiple years of companies, not necessarily impact for the specific funding provided in that FY
- USTAR statutory reporting of company data is done on a calendar year basis rather than FY
- Metrics that rely on federal data as a reference point may lag by 2-3 years
- SBIR/STTR data for the State in terms of applications is not available from all federal organizations

Thank You



TREATMENT OF CHRONIC PAIN WITH CBD & THC

Medical Marijuana Study by:

Deborah Yurgelun-Todd, PhD & Perry Renshaw, MD, PhD

MEDICAL MARIJUANA STUDY

Rationale

- 33,000+ opioid related overdose deaths in 2015
- Epidemic of opioid use is increasing
- A safer analgesic alternative for chronic pain is necessary
- ~80% of individuals who seek medicinal marijuana do so for chronic pain
- Few studies show THC versus CBD versus placebo



WHAT THE SCIENTIFIC COMMUNITY HAS FOUND

Results with THC (tetrahydrocannabinol)

- Smoked or vaporized doses of THC have moderate to high analgesic effects
- Few studies have been done on oral doses of THC

Results with CBD (cannabidiol)

- Few studies have been done with CBD and pain
- CBD has been found to help with appetite stimulation and nausea
- There have been very few studies comparing the analgesic effects of oral THC with CBD



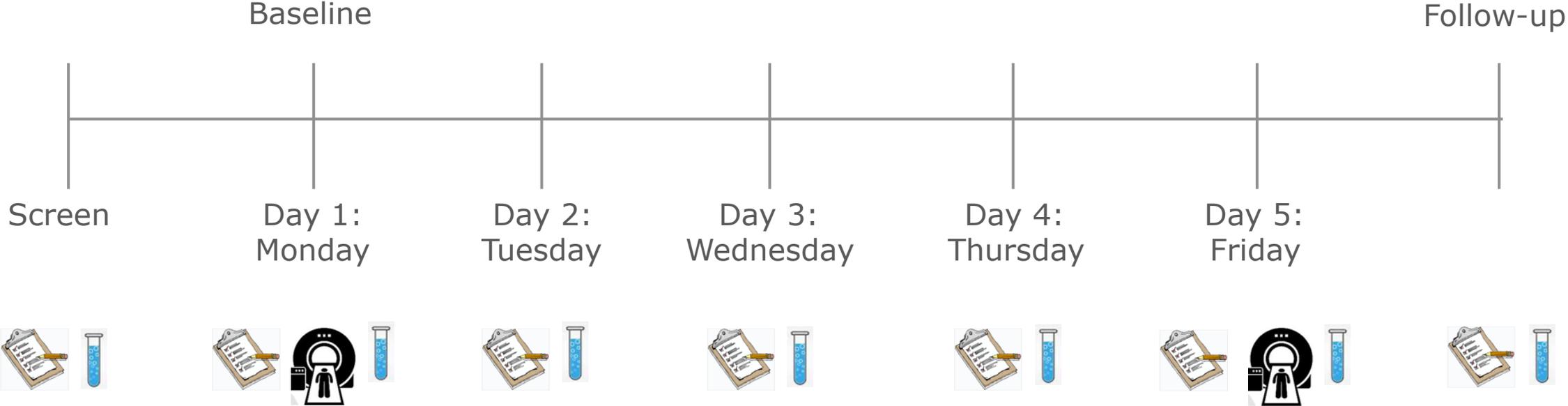
STUDY OBJECTIVE

Examine effects of tetrahydrocannabinol (THC) and cannabidiol (CBD) on:

- Chronic pain intensity and symptoms
- Life functioning as a result of chronic pain
- Brain metabolism, brain connectivity, and brain structure changes as a result of acute use of THC or CBD

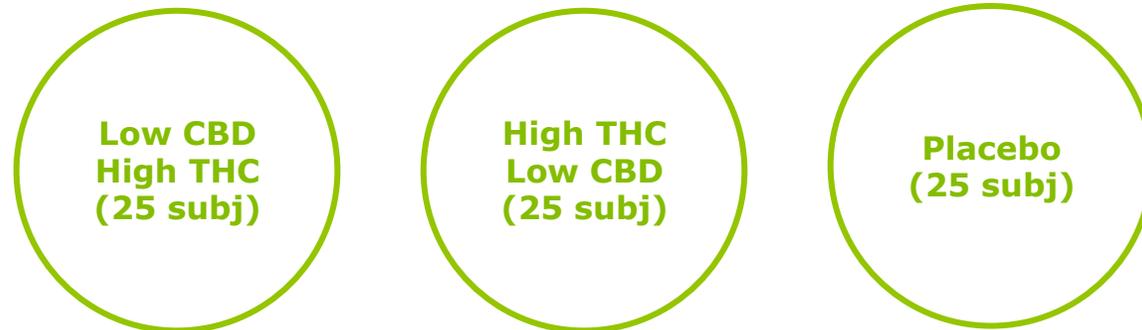


STUDY DESIGN



STUDY SUBJECTS / TREATMENT GROUPS

- Double-blind, placebo-controlled
- 75 total subjects, randomly assigned to one treatment arm
- Recruitment from pain clinics of patients with chronic pain and prior marijuana use (during lifetime)
- Will stay on current medication regime during study



DRUG MANAGEMENT

- Product procured through NIDA Drug Supply Program
 - Standard doses
 - Stability and safety approved by the FDA
 - Comparison to other studies
- Study Drug
 - 10mg high THC (>70%), low CBD (<1%)
 - 500mg high CBD (>50%), low THC (<1%)
- Only Federally legal supplier of marijuana



REGULATORY REQUIREMENTS

Food & Drug Administration (FDA) safe to proceed letter

Institutional review board (IRB) protocol approval

DEA Schedule 1 renewal

Certificate of Confidentiality from FDA



ADMINISTRATIVE NOTES

- Experimental protocol was reviewed by two experts
- Study reviewed with members of the legislature
- Contract that specifies deliverables



THANK YOU