

Labtolmpact

CTL IP & Commercialization Series

LTI#1: Understanding the Technology Commercialization Process



10/3/2024

*This session will be recorded



Cornell Research Innovation

Presenters









Lisa Placanica '00 PhD '09
Senior Managing Director,
CTL @ WCM

Bill Pegg Director of Intellectual Property

Lynda Inseque MS, MBA'25
Director, Technology and
Venture Initiatives &
Engagement

Martin Teschl
Director, BD & Licensing,
Physical Science



Agenda

• CTL Activities & Resources

University Technology Transfer & Bayh Dole

• Intellectual Property Primer

Evaluating and Commercializing Innovations





About Cornell Research & Innovation

\$1,451.9 M – FY23 research expenditure

~57%

Cornell University



\$697.6 M In Federal Funding ~43%





Weill Cornell Medicine-Qatar





Geneva, NY

Cornell Tech NYC

Weill Cornell Medicine NYC

Weill Cornell Medicine Qatar



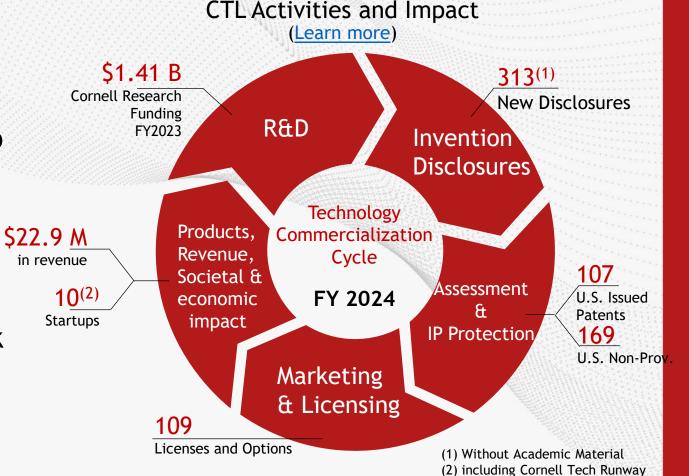
About The Center for Technology Licensing at Cornell University (CTL)

CTL is the commercialization arm of Cornell University, managing the Intellectual Property resulting from the University's scientific discoveries.

Mission

 Catalyze technology commercialization to develop products and services from university innovations for societal benefits

 Promote new technology ventures to foster economic development within New York State and across the nation







CTL Four Pillars

Gap Funding Technology Technology Education Licensing & IP & Programs Startups & Outreach **SERVICES** • Manage University IP • FastTrack Startup License • Accelerate Technology CTL Practicum • Support Inventors & • Startup & Investor

Networking

Ecosystem Support

Researchers

· Marketing & Licensing



• Support New Venture

• Train Entrepreneurs

• External & Internal

Events



CTL Activities per Pillar (FY24)

Gap Funding & Programs



- New: Accelerated Format of Ignite Fellow Program
 - 3 startup projects funded
 - 13 research-lab projects revenue
 - 5 Ignite intern selected for summer internship with Cornell licensed startups

Technology
Licensing & IP

- Manage University IP
- Support Inventor Licenses

313 New Disclosures

251 Issued patents globally

109 Licenses & Options

\$22.9 Million in revenue

Technology Startups

- Ignite Cornell R L2M
- FastTrack
- Startup Networking
- VC Relationships

10 Startups

• 6 in NY State

5 express licenses:

- ENG/Physical Sc techs
- MedTech+

Funding raised by active startups

• \$418.6 Million

Education & Outreach

- CTL Practicum / Classes
- Office Hours
- Externally and Internally focused events

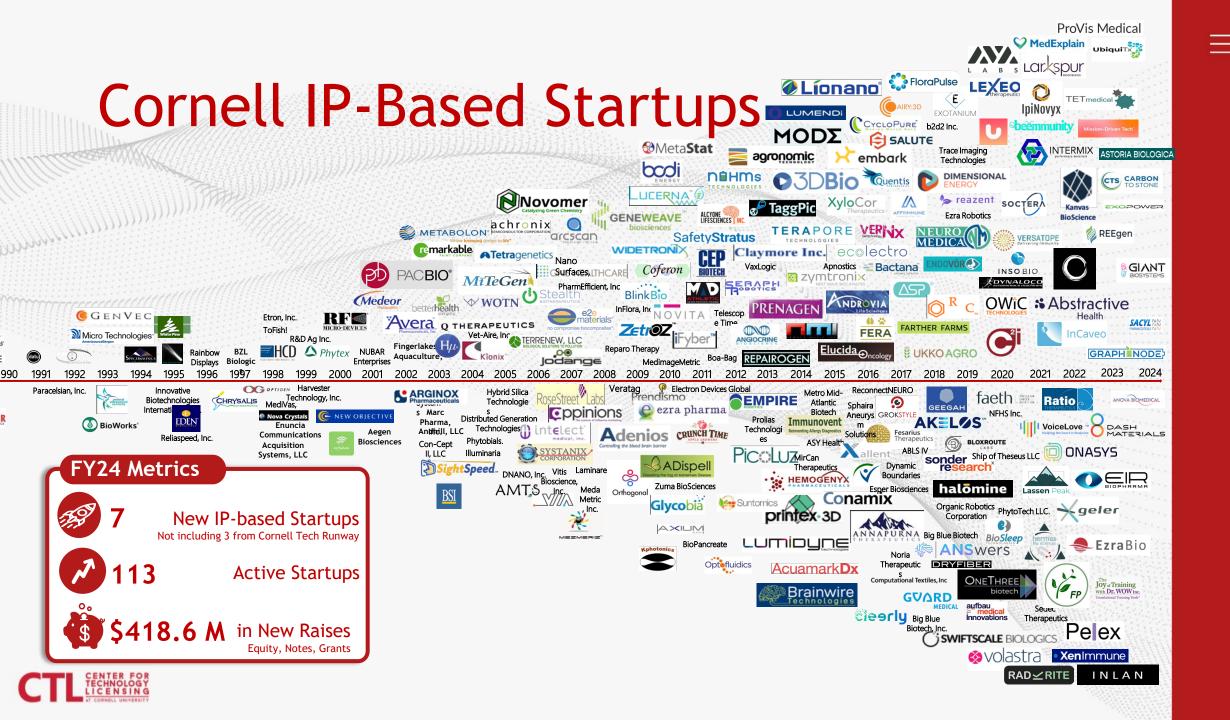
14 Practicants

34 external outreach events

70 Office Hours

14 internal outreach events (training, MeetUps)

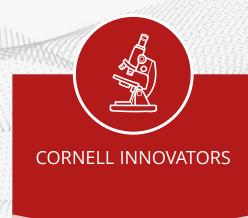








Overview - Programs and Initiatives



- Office Hours
- Recognition (<u>Bearer of Innovation</u>)
- Educational Programming (<u>Lab to</u> <u>Impact Series</u>, , etc.)
- <u>CIVA Roundtable</u> as a presenter
- <u>Ignite Innovation</u> <u>Acceleration grant</u>
- Ignite Fellow to become a co-founder and



ENTREPRENEURS & STARTUPS

- Ignite Fellow for New Ventures - Accelerator program
- FastTrack license
- Ignite Startup Fund
- Cornell technologies investment brief
- Ignite Connect (Online)
- Ignite Showcase
- Select invitation to JPM satellite events, etc.



STUDENTS

- CTL Practicum
- Ignite Intern for Startups
- Educational Programming (<u>Lab to</u> <u>Impact Series</u>, etc.)

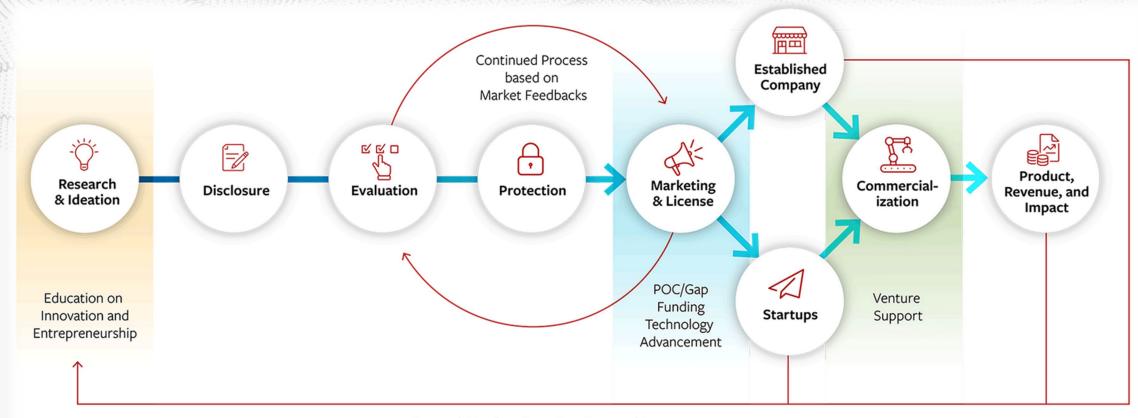


CORPORATE PARTNERS & INVESTORS

- <u>CIVA Roundtable</u> as advisors
- Cornell technologies investment brief (active fundraising)
- <u>Ignite Connect</u> (Online)
- <u>Ignite Showcase</u>
- Select introduction to Cornell innovators and startups



Our Technology Commercialization Process



Research Funding, Donation, Partnership



Learn more



Recompact Educational Programming

- Comprehensive and more integrated program series
- Showcasing the full journey of commercialization to impact
- 4 main modules

Labtolmpact

CTL IP & Commercialization Series







Healthcare



Social Science

Pick your module based on your learning interest!



Cornell Innovation & Venture Advisors

- Seasoned experts from diverse backgrounds (industry leaders, entrepreneurs, investors.
- Providing valuable insights to innovators associated with Cornell with constructive feedback on commercialization strategies, market, and developmental pathways.
- Facilitating connections to potential entrepreneurs and commercial partners, fostering a collaborative and supportive ecosystem.





CTL Practicum

- Internship program for grad students
- 9-month commitment (preferably a year)
- Up to 10 hours/week
- A formal onboarding training
- Support of the marketing & IP processes

CTL PRACTICUM

Alumni of the program



Jin Liang, Ph.D
Technical Specialist
Finnegan





Jordan Johnson, M.ENG Associate Scientist

Andrew Murtha, PhD
Scientific Analyst
Morrison Foerster





\equiv

Hearing Directly from Practicant Alumni

2020 Practicum Cohort

The CTL Practicum allowed me to learn about the breadth of different technologies in the Biomedical and Physical science departments and how to market them to potential licensees. As an aspiring future biomedical entrepreneur, I found it very valuable to get a sense of what types of technologies could be commercialized and how to pitch them.

- Olga Lyudovyk, Ph.D.
candidate Tri-I Computational Biology
and Medicine at Cornell
University

2022 Practicum Cohort

Working at the CTL has provided me with insight into everything from the details of licensing and technical marketing to the bigger picture of the "business side of science". It's rewarding to play an active role in commercializing the incredibly diverse and cutting-edge research here at Cornell.

- Andrew Murtha, Ph.D. '23
Department of Microbiology at
Cornell University



Innovation Fellowship

- Program for Ph.D. graduates and postdoctoral researchers
- Interested in a career in business development, commercialization or technology venture creation

- Full-time employees
- One-year contract



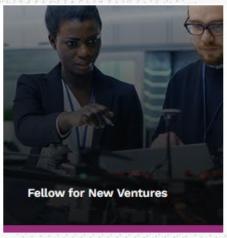
Tian TangInnovation Fellow,
Physical Sciences



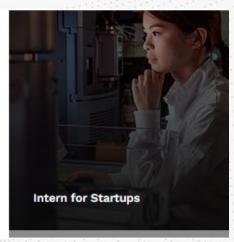


Ignite, a Gap Funding Program Series









Targeted Audience	Researchers with invention disclosures	Master's degree and PhD holders & faculty- inventor with IP	Cornell licensed Startups, clients of Cornell incubators	Cornell licensed Startups
Funding Amount	Up to \$50K	\$120K for 12 months	Up to \$50K	\$10K/Ignite Intern
Funding Type	Grant	SAFE Note (<u>similar</u> to Y-Combinator)	SAFE Note (<u>similar</u> to Y-Combinator)	Direct Compensation to interns
Cycle	2 cycles (Spring, Fall)	Annual cycle	On a rolling basis	Beginning of Academic Year
Weblink	https://ignite.ctl.cornell.ed	https://ignite.ctl.cornell.edu	https://ignite.ctl.cornell.edu/	https://ignite.ctl.cornell.edu/i



CTL Leadership



Alice Li, PhD '98
Executive Director



Lisa Placanica '00 PhD '09
Senior Managing Director,
CTL @ WCM





The Technology & Venture Initiatives and Engagement Team



Lynda Inseque
Director, Technology and
ventures Initiatives
& Engagement



Kris Valentine Behnke
Innovation Outreach
Manager



Aaron Delahanty
Technology Acceleration
and Venture Manager





IP Management Team



Bill PeggDirector of Intellectual
Property (IP)

Patent Management



Gene Masters
Senior IP Officer, Life sciences



Zoe ZhongIP Officer, Physical sciences



Eric BryantIP Officer, CTL@WCM

IP Services



Michelle Shields

IP services Manager



Stephanie G. Reich

IP & Governance Assistant



Renee Passeri
IP Assistant



BD & Licensing Teams - Ithaca-based

=

Life Sciences



Phillip Owh
Director, BD & Licensing
- Life Sciences



Sarah Ward

BD & Licensing

Associate

Marie Donnelly

BD & Licensing

Associate



Aris Despo
Associate Director, Life
Science



Stephen Nowak

BD & Licensing

Associate



Albert Y. Tsui
Associate Director, Plant
Varieties



Emily Courson

BD & Licensing

Associate, Plant Varieties





Martin Teschl
Director, BD & Licensing
- Physical Sciences



Maxim Shabov

BD & Licensing

Associate



Ryan Luebke
Associate Director,
Physical Sciences

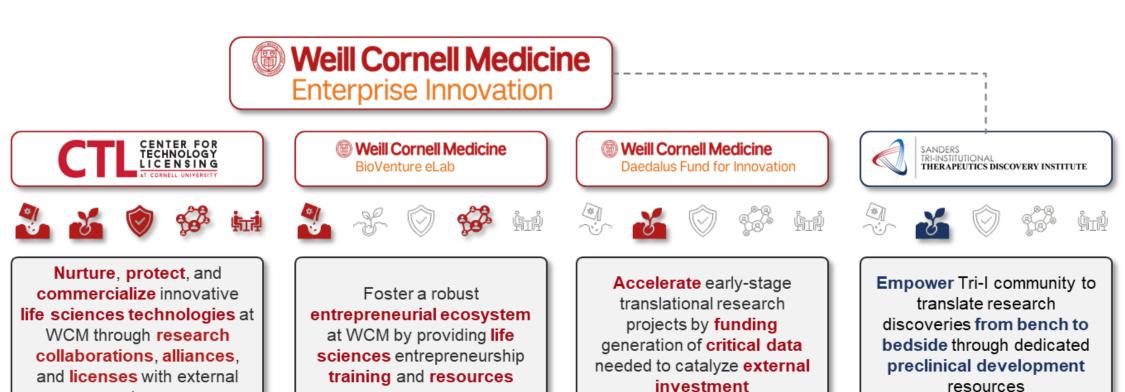


Tian Tang
Innovation Fellow



Join one of the Office Hours to learn about disclosing your innovation

A consolidation and reorganization of key innovation and eShip offices and resources exclusively focused on the needs of the medical/graduate school



Each branch of WCM EI collaboratively supports key aspects of the innovation lifecycle for the medical school



partners

CTL @ Weill Cornell Medicine



Lisa Placanica Senior Managing Director, CTL @ WCM



Brian Kelly Director, Technology Licensing



Donna Rounds Associate Director, BD and Associate Director, BD and Associate Director, BD and Licensing



Louise Sarup

Licensing



Jeff James Licensing



Jamie Brisbois Manager, Business Development and Licensing



Iris Bica **Business Development and** Licensing Associate



Ivan Gando **Business Development and** Licensing Associate

CTL @ Weill Cornell Medicine



Mina Zion

Associate Director for Innovation and Commercialization WCM- Qatar



James Bellush, Ph.D.

Manager, Scientific



Bruce Toman
Technology Transactions
Associate and MTA
Coordinator



Richard Nyguen, Ph.D. Manager, Alliance Management PICI

BioVenture eLab



Director,
BioVenture eLab



Education, Programming, and Mentorship: Planting the Seeds of Innovation and eShip



PHAR 9021

A WCM Graduate School course provides hands-on training in the management of academic innovations

Module I:

Intellectual Property Protection

- Lecture 1: Technology Transfer
 101 and WCM EI Overview
- Lecture 2: Patents 101 and Claims Construction
- Lecture 3: Conducting a Prior Art Search
- Assignments:
 - Draft Patent Claims
 - Prior Art Search

Module II:

Technology Evaluation

- Lecture 4: Invention Disclosure and Evaluation Process
- Lecture 5: Invention Assessment Presentations
- Assignments:
 - Invention Assessment #1
 - Invention Assessment #2

Module III:

Partnering Academic Technologies

- Lecture 6: Marketing 101 and Industry Biz Dev Panel
- Lecture 7: PowerPoint
 Productivity & Marketing Deck
 Tutorial
- Lecture 8: Presentations & Identifying Potential Partners
- Lecture 9: Mock Negotiation
- Assignments:
 - Technology Marketing Package





Cornell Policies & Priorities

http://www.ctl.cornell.edu/inventors/cornell-policies.php

Cornell claims ownership of its employee's inventions and most other forms of intellectual property and seeks to develop them:

- for the public good NY State is first priority
- to get a reasonable return licensing

As with other universities, licensing is a tool to:

- recruit and retain faculty and students
- increase research sponsorship
- create closer ties to industry

Zero financial risk in working with CTL for faculty, staff and students





Bayh-Dole Act

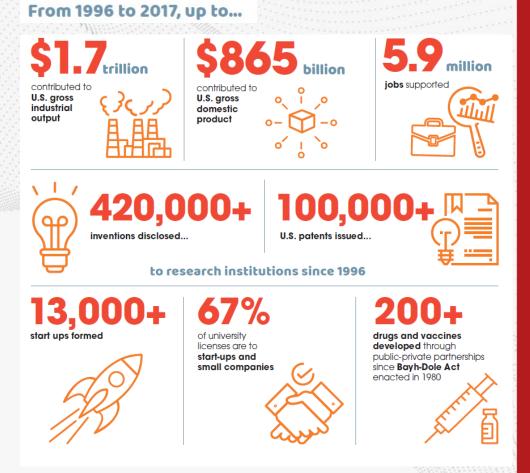
The Economist (2002):

Possibly the most inspired piece of legislation to be enacted in America over the past half-century was the Bayh-Dole act of 1980

Pre Bayh-Dole:

- less than 5% of the 30,000 patents owned by govt' from federal research was licensed to commercial entities
- Only about a dozen institutions (Cornell was one) had commercial technology transfer offices









Cornell Innovation Impact





Bayh-Dole Act

Transferred right of ownership of intellectual property developed from federally funded research from the US Gov't to the academic research institution



- 1. Must try to commercialize
- 2. Preference for licenses to US companies
- 3. Preference for small business over large
- 4. US manufacturing requirements
- 5. Distribution of \$ to inventors

NOTE -- University must also:

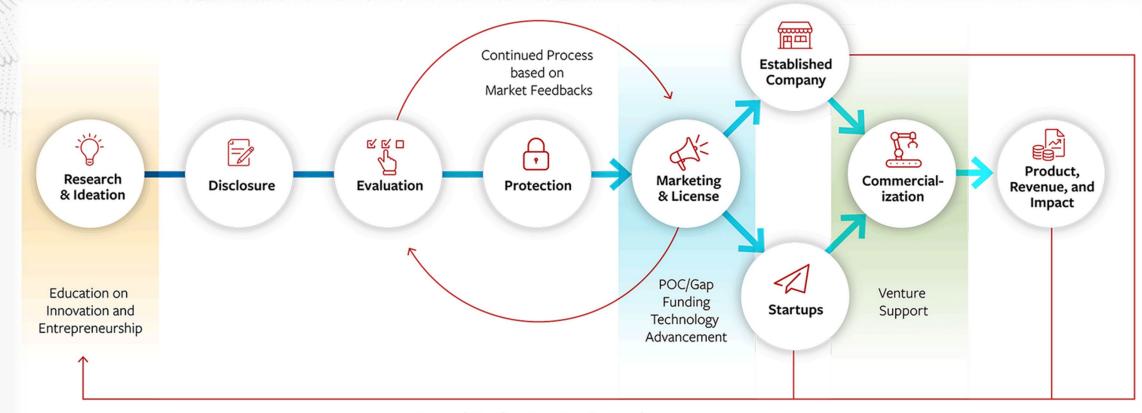
- 1. Report invention to the government
- 2. Grant non-exclusive rights to US Gov't
- 3. Reserve government "march-in" rights







Our Technology Commercialization Process



Research Funding, Donation, Partnership



Learn more

Intellectual Property







Therapeutics:

- **Small Molecules**
- **Biologics**
- Cell/Gene Therapy
- **Novel Targets**

Medical Devices:

- **Imaging** Equipment/Methods
- Surgical Devices/Implants
- Equipment

Diagnostics:

- Molecular
- Histological
- **Imaging**
- mAb based





Ag & Food

- Crops & seeds
- Precision Ag
- Food Packaging & Processing
- Ingredients

Hi Tech:

- Robotics and Autonomy
- Materials
- Renewables
- **Energy & Storage**
- Software (AI/ML, Cyber security, crypto)
- **Transportation &** Infrastructure
- Quantum Eng., Comp & Communication
- Sensors
- Semiconductor & Electronics



Research Tool:

- Mouse models
- Research mAbs
- New research methodologies



- Clinical care models/workflows
- Unique structured data sets
- **INDs**



Digital Health:

- **Therapeutics**
- "alerts"
- Clinical work-flow aides
- Systems utilizing Al/Machine Learning **Algorithms**

...IP THAT CAN IMPACT SOCIETY





Types of Intellectual Property



Patents

- <u>Legal monopoly</u> granted in return for public disclosure of an invention
- Gives the right to <u>exclude others</u> from practicing the invention
- Only enforceable once issued
- Patents <u>valid from 20 years</u> from application date (not issue date)
- Inventorship is <u>legally defined</u> and distinct from authorship



US011417884B2

(12) United States Patent

(10) Patent No.: US 11,417,884 B2 (45) Date of Patent: Aug. 16, 2022

(54) TITANIUM DISULFIDE-SULFUR COMPOSITES

Wuhan (CN)

(71) Applicants:CORNELL UNIVERSITY, Ithaca, NY
(US); WUHAN UNIVERSITY, Wuhan

(72) Inventors: **Héctor D. Abruña**, Ithaca, NY (US); **Yao Yang**, Ithaca, NY (US); **Fu-Sheng Ke**, Wuhan (CN); **Xiao-Chen Liu**,

(73) Assignees: CORNELL UNIVERSITY, Ithaca, NY
(US); WUHAN UNIVERSITY, Wuhan

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 247 days.

21) Appl. No.: 16/771,776

(22) PCT Filed: Dec. 20, 2018

(86) PCT No.: PCT/US2018/066797

§ 371 (c)(1), (2) Date:

Jun. 11, 2020

(87) PCT Pub. No.: WO2019/126499 PCT Pub. Date: Jun. 27, 2019

(5) Prior Publication Data

US 2021/0194004 A1 Jun. 24, 2021

Related U.S. Application Data

(60) Provisional application No. 62/608,230, filed on Dec. 20, 2017.

(51) Int. Cl. H01M 4/00 H01M 4/58

(2006.01) (2010.01) (Continued) ,

(52) U.S. Cl. CPC *H01M 4/5815* (2013.01); *H01M 4/0404* (2013.01); *H01M 4/366* (2013.01);

(S8) Field of Classification Search

See application file for complete search history.

56) References Cited

U.S. PATENT DOCUMENTS

4,007,055 A 2/1977 Whittingham 4,233,377 A 11/1980 Haering et al. (Continued)

FOREIGN PATENT DOCUMENTS

106935796 A 7/2017 3203567 A1 8/2017 (Continued)

OTHER PUBLICATIONS

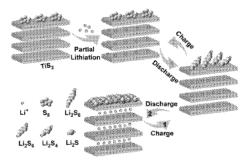
International Search Report and Written Opinion of the International Searching Authority for International Application No. PCT/ US2018/066797 dated Mar. 28, 2019.

(Continued)

Primary Examiner — Cynthia H Kelly Assistant Examiner — Monique M Wills (74) Attorney, Agent, or Firm — Heslin Rothenberg Farley & Mesiti P C.

(57) ABSTRACT

A titanium disulfide-sulfur (TiS₂—S) composite particle contains a titanium disulfide (TiS₂) substrate having solid elemental sulfur (S) disposed directly on a surface of the TiS₂. The TiS₂ substrate has a layered crystalline hexagonal structure of space group P-3 ml and includes at least 100 distinct layers. The TiS₂ and S are present in the composite in a weight ratio (TiS₂:S) of 20:80 to 50:50. Cathodes and (TiS₂:S) of 20:00 to 50:50.

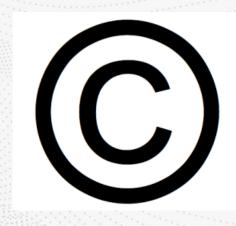






Copyright

- Copyright protects "original works of authorship fixed in a tangible medium of expression."
- Copyright protects computer software as a "literary work." Copyright law does not protect the functional aspects of a computer program, such as the program's algorithms, formatting, functions, logic, or system design and merely protects its expression.
- Data itself is <u>not</u> copyrightable, but a creative arrangement, annotation, or selection of data (a compilation) can be protected by copyright.







Trademark

- A trademark can be any word, phrase, symbol, design, or a combination of these things that identifies an origin for a particular good or service.
- Standard character-only trademarks

RUBYFROST® SNAPDRAGON®

 Special form trademarks include trademarks that are stylized, have designs, or are in color.





Requirements of Patentability

What can be patented?

35 U.S.C. §101 - Subject Matter to be protected is limited to one of the four statutory categories:

 "Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof"

What can't be patented?

Judicial exceptions: laws of nature, products of nature, abstract ideas, natural phenomena





Requirements of Patentability

• 35 U.S.C. §102 - "Novelty" - No one has done the same thing previously

• 35 U.S.C. §103 - "Non-Obvious" - A person of ordinary skill in the relevant art would not reasonably have been expected to have modified or combined known prior art to arrive at the claimed invention.





Requirements of Patentability

- 35 U.S.C. §112 Requires that the specification include the following:
 - (A) A written description of the invention;
 - (B) The manner and process of making and using the invention (the *enablement* requirement); and
 - (C) The **best mode** contemplated by the inventor of carrying out the invention.





Type of Patents

Provisional Patent Applications

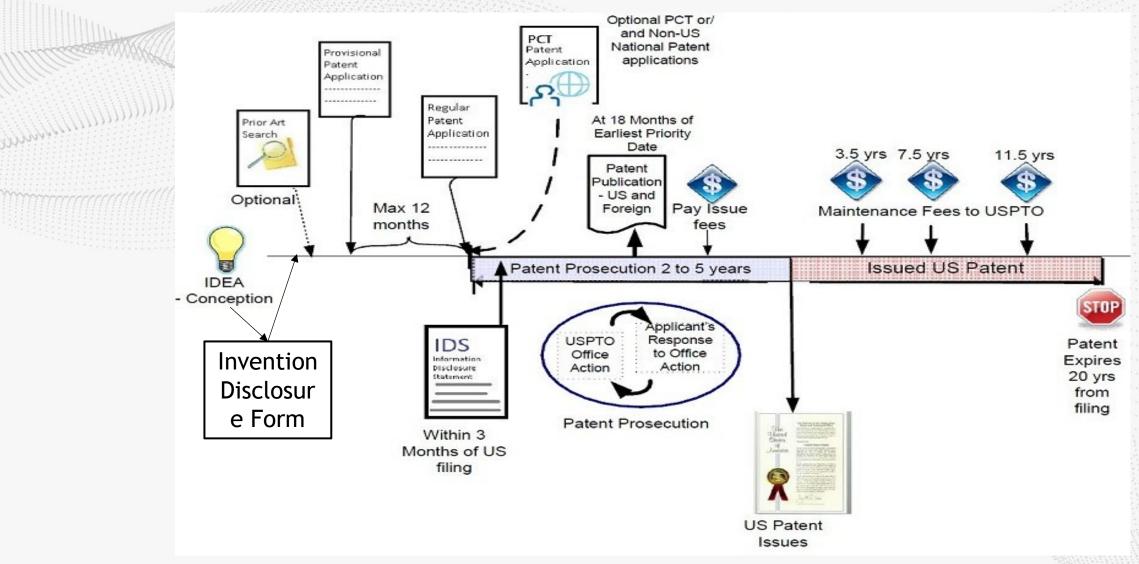
- Informal Application
- Can be filed relatively quickly
- Not Examined Priority "placeholder" for subject matter that is disclosed and enabled
- Expires automatically after one year

Non-Provisional / Patent Cooperation Treaty (PCT) Applications

- Formal applications
- Must be filed within one year of provisional application(s)
- Must **fully describe** the invention in sufficient detail to **enable** a person of ordinary skill in the art to make and use the invention (35 USC 112).



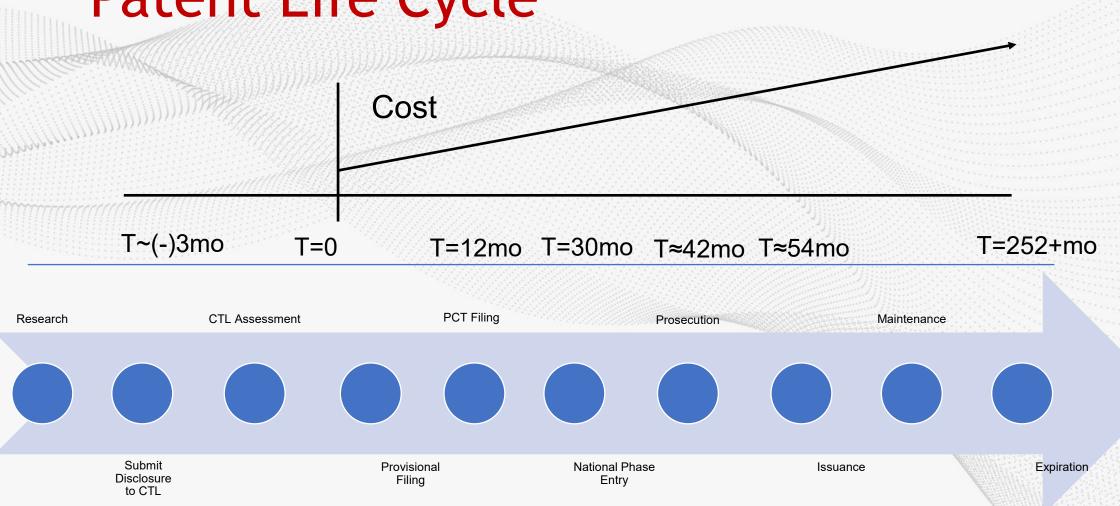
Patent Life Cycle







Patent Life Cycle







Inventorship

Inventorship

- Different than authorship.
- Legal determination analyzed in view of case law and the facts presented.
- Defined relative to claimed subject matter of the invention.
- Inventorship can *change* during prosecution if claims are amended, cancelled or added.
- One must contribute to the conception of the claimed invention to be an inventor.
- *Merely assisting* implementation, being on a team, or supervising a team does not automatically make a person an inventor.
- Co-inventorship requires *more* than a mere contribution of well-known concepts and/or the current state of the art.





Cornell IP policies

Policy 1.5 Inventions and Related Property Rights

 Policy 4.10 Use of Cornell's Name, Logos, Trademarks, and Insignias

• Policy 4.15 Copyright





Public Disclosure Can Jeopardize Patent Rights

- Manuscript publication
- Pre-print postings (e.g., BioRxIV; early online access)
- Published Abstracts
- Open thesis defense
- Posters/Talks
- Awarded federal grant applications
- Speaker engagements
- Social media postings
- Commercial use/sale

*when in doubt contact CTL well before any such disclosure to discuss *







How it starts

Submit Your Disclosure

Disclosing your idea or discovery (preferably prior to any public presentation) is the initial step to engaging with CTL and starting the technology commercialization process. Fill out the relevant disclosure form:

-> Invention Disclosure Form

Copyright Disclosure Form

Material Disclosure Form

Access CTL website





CTL ONLY:

Docket No.:

Completed form should be submitted via:

Ithaca: CTL, 395 Pine Tree Road, Suite 310, Ithaca, NY 14850 WCM: CTL, 1155 York Ave, New York, NY 10065

CTL, 395 Pine Tree Road, Suite 310

Fax: 607.254.5454 (original signature copy must be sent separately)

E-mail: ctl-patents@cornell.edu (original signature copy must be sent separately)

If you have any questions, please email ctl-patents@cornell.edu or call 607.254.4698

I. Title of Invention

II. Brief Description of Invention*

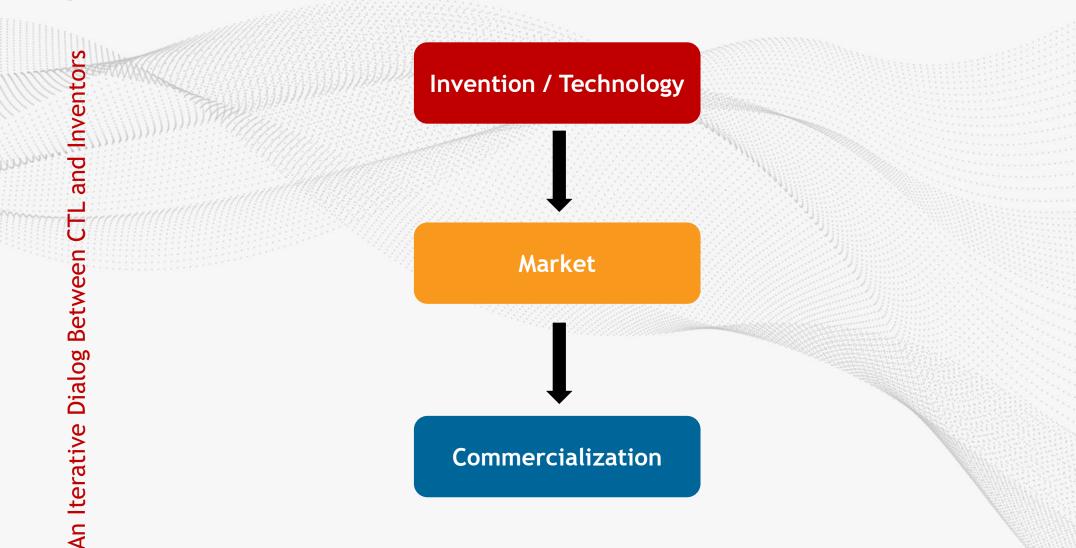
*For a complete description please include an Attachment with the following:

- 1. Background of the Invention and Related Technologies
- a. What problem does your Invention solve?
- b. To your knowledge, are there existing technologies, products, or solutions that address the same problem?
 - Please name and describe them.
- c. List all relevant publications, patents and competing inventors or labs that you are aware of.
- 2. Unique Features of the Invention
- a. List all of the features that distinguish the Invention over the Related Technologies.
- 3. Detailed Description of the Invention including:
- a. How to make and use the Invention
- b. Best way of making the Invention
- c. Drawings or pictures of all versions of the Invention
- 4. Possible alternative versions and variations of the Invention
- 5. Probable uses of the Invention

Please suggest some keywords/categories for this invention that would be used to identify it:

395 Pine Tree Road, Suite 310 Ithaca, NY 14850 • P: 607-254-4698 • F: 607-254-5454 • E: cll-patents@comell.edu • www.ctl.comell.edu







Factors Considered When Deciding to Invest in an Asset

- What <u>problem</u> does the technology address?
- How can the <u>intellectual property be protected and leveraged?</u>
- Can the invention be <u>policed</u>? Are there <u>freedom-to-operate</u> concerns?

Invention / Technology

- What are the <u>competing solutions</u> (both existing <u>and</u> in development)?
- What <u>advantages and distinguishing features</u> does the technology have?
- Is it a <u>platform technology</u> or improvement? What is <u>its initial application</u>, or indication?





Factors Considered When Deciding to Invest in an Asset

- Who is the <u>ultimate customer</u> and who will pay for it (and pay for what)?
- What is the <u>market size</u> and is it large enough to support commercial development costs?
- Who are the <u>commercial partners</u> in the field (corporate and investor)?

Market



Factors Considered When Deciding to Invest in an Asset

- What is the <u>development status</u> What are the <u>immediate and longer-term "next steps"</u> for further validation (timeline and funding)?
- Will manufacturing be difficult?
- What will the regulatory pathway look like?

Commercialization

 What <u>data are needed to support</u> intellectual property strategy and commercial outreach?





Marketing Inventions - Commercial Outreach

Iterative Dialog between CTL, Inventors, and Potential

Partners



- Generate marketing materials (value proposition!)
- Identify & contact companies, entrepreneurs, investors
- Web postings, cold calls, email campaigns, social media
- Strategic partners
- Technology Showcase Events
- Network, network, network!
 - Seek recommendations, information, feedback, referrals
 - Alumni & Friends of Cornell with various backgrounds, expertise and industry and/or venture experience
 - Cornell and Ithaca ecosystem E@C, Rev:Ithaca, eLab, Interior Northeast I-Corps Hub (IN I-Corps), Center for Life Science Ventures (CLSV), Praxis incubators, etc.





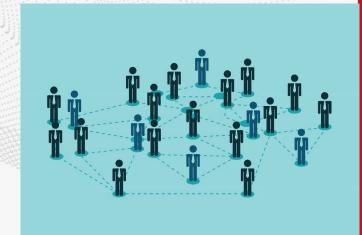




The Inventor's Role

- Technology Transfer an ongoing iterative process in consultation with the inventors and potential industry partners
- Inventors are critical partners for CTL to achieve commercial marketing success!
- Anecdotal: 80% of university licensing deals are with startups and/or begin with the researcher's existing industry relationships (CTL's hit rate higher)
- Make industry contacts at conferences and let CTL know about them
- You are not "just" a scientist at the conference; you are also "selling" your inventions

NETWORK





Engage with Us and Reach out to CTL teams at any time!

· CTL BD & Licensing Officers can assist even at the early ideation stage.

 In addition to department presentation, CTL team members hold regular office hours to in campus or virtually to answer your IP, commercialization

strategy questions.



















Contact Information

For Information about Disclosures



Lisa Placanica

Senior Managing Director, CTL @ WCM lmp26@cornell.edu



William (Bill) Pegg

Director of Intellectual Property wdp48@cornell.edu



Phillip Owh

Director, Business Development & Licensing - Life Sciences po62@cornell.edu



Martin Teschl

Director, Business Development & Licensing - Physical Sciences mt439@cornell.edu

For Information about CTL Programs



Lynda Inseque

Director, Technology and Ventures Initiatives & Engagement lci2@cornell.edu





QUESTIONS?

Follow CTL on your favorite social platforms for more information and features of Cornell Technology!







Take a Short Survey



SCAN ME

Scan or Click the code to complete a 45-second survey

Give us an idea of what YOU would like to see in Lab to Impact programming!

