

Life of a Stanford Invention

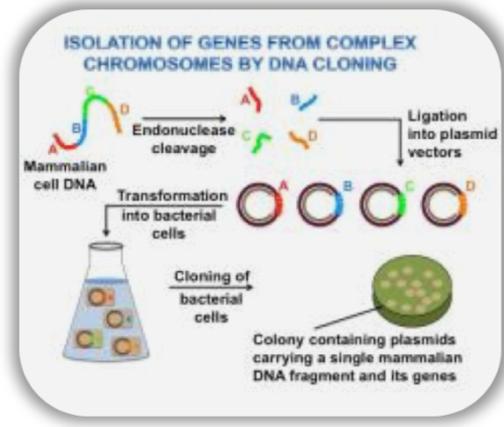
Notable Stanford Inventions



Functional
Antibodies



FM Sound
Synthesis



Recombinant
DNA



Google

Timeline of Stanford Inventions

- 1970 – OTL Established
- 1971 – FM Sound Synthesis (\$22.9M)
- 1974 – Recombinant DNA (\$255M)
- 1981 – Phycobiliproteins (\$46.4M), Fiber Optic Amplifier (\$48.4M), MINOS (\$4.2M)
- 1984 – Functional Antibodies (\$425.7M)
- 1987 – Selective Amplification of Polynucleotides (\$28.1M)
- 1990-1992 – Discrete Multi-tone technologies for DSL (\$29.7M)
- 1993 – Microarrays (\$2.1M), MIMO for Wireless Broadcast (\$1.6M)
- 1994 – In vivo Bioluminescent Imaging (\$9.4M)
- 1996 – Improved Hypertext Searching - Google™ (\$339.2M)
- 2001-2003 – Data Visualization Software
- 2004 – Refocus Photography (\$324.6K)
- **2014 – the next big thing ???**



Stanford inventions begin as nascent ideas

supported by over **\$1 billion per year** of funding for research across 7 schools and SLAC.

Big Picture

Stanford Budget FY13-14:

\$4.8B Total

\$1.35B for research

\$931.6M of gifts (FY13)

\$18.7B Endowment

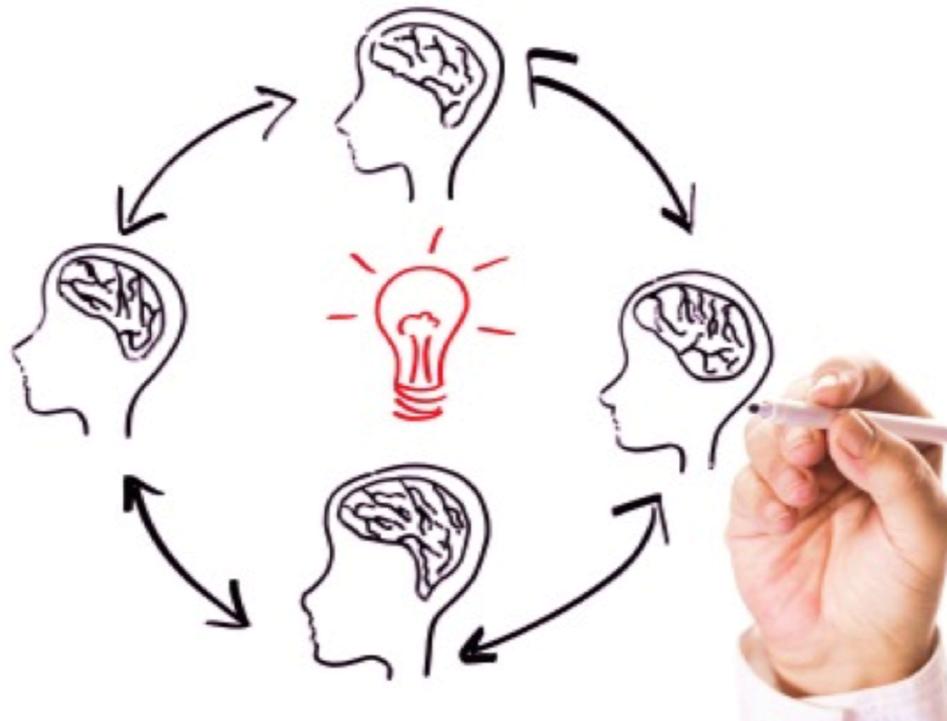
OTL \$87.0M income in FY13



Stanford has over **15,000 students** and over **2,000 faculty** members that teach and conduct research.



How are Stanford innovations transferred to others to develop into new products and companies?



Most research is transferred through...

graduate students, publications, seminars, faculty consulting, industry sponsored research and industrial affiliate programs.

Background: Stanford Intellectual Property Policies

SU18 – Stanford University Patent and Copyright Agreement

Patent policy- University takes title to all inventions created with **more than incidental** use of university resources

Copyright policy - University takes title to copyrightable works created with **significant** university resources

The Office of Technology Licensing (OTL) is responsible for...

the formal transfer of
patents, copyrights and
other technology through
license agreements.



OTL's Mission:

To promote the transfer of Stanford technology for society's use and benefit while generating unrestricted income to support research and education.



Most Inventions are Never Licensed

9-10 invention
disclosures/week

50% have patent
applications filed

20-25% are licensed*

*some inventions such as software
and biological materials are licensed
without patent protection



Disclosures

Then. . .

28 in 1970

Now. . .

502 in 2013

9,897 cumulative

How Does OTL Decide?



Licensing teams try to decide which inventions can make an **impact**.

Questions

Is the invention evolutionary or revolutionary?

What is the stage of development?

Is it patentable and could a patent be enforced?

What is the potential market size?

What is the inventor's track record?

Licensing Teams* Decide Patent and Licensing Strategy



*Licensing Associate and Liaison teams have technical degrees and are market focused.

“Cradle to Grave”

Evaluate overall potential

Develop intellectual property strategy and manage patent prosecution

Determine when and how to market and license the invention

Negotiate contracts

Maintain and amend agreements

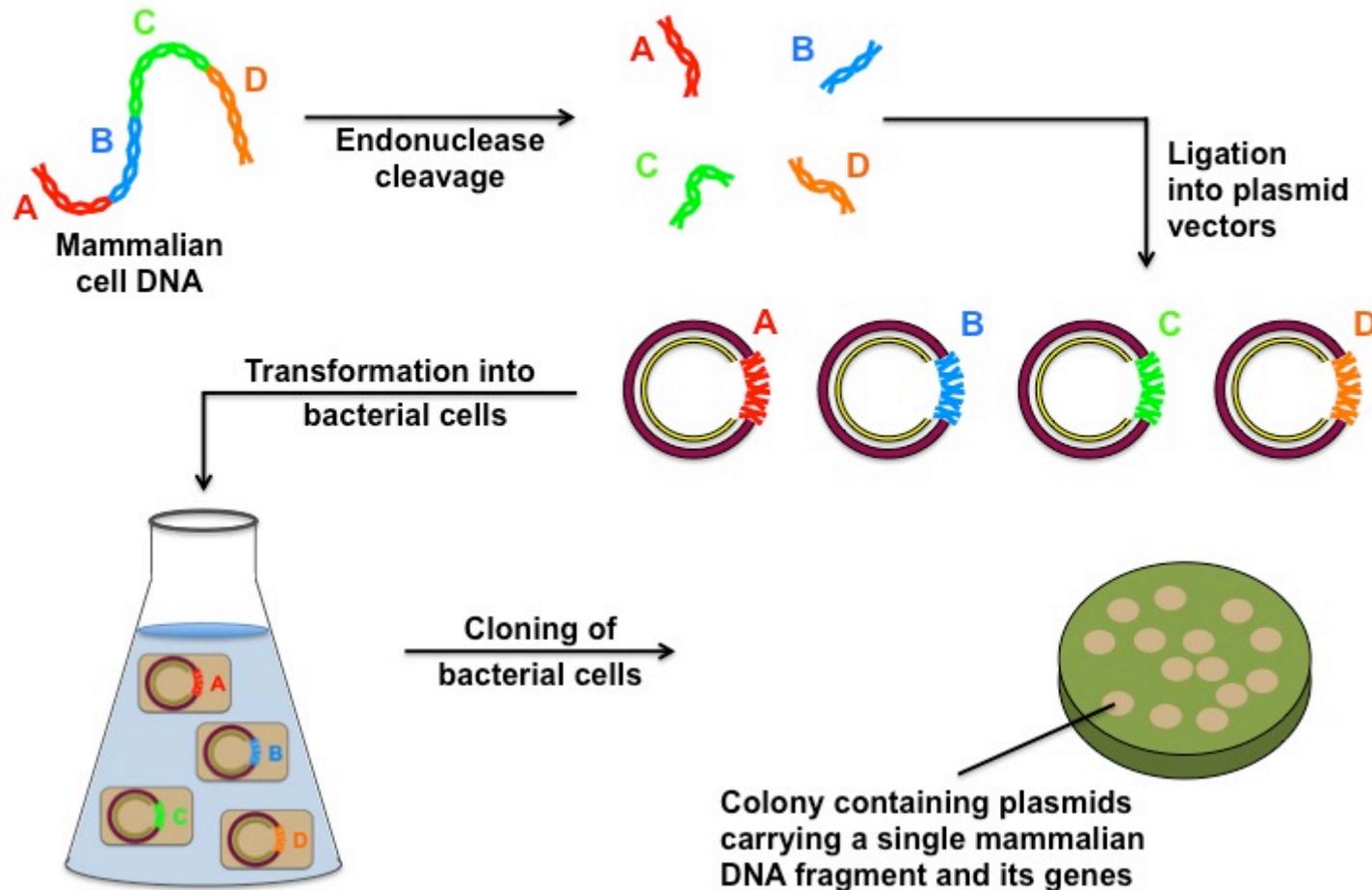
Monitor development and commercialization and track royalty payments

OTL Markets Broadly to Find the Best Fit for the Technology



Recombinant DNA: Many Companies of All Sizes

ISOLATION OF GENES FROM COMPLEX CHROMOSOMES BY DNA CLONING



FM Sound: One Big Company



Functional Antibodies: One Mid-Sized Company



Google: One Start-Up Company



103 New License Agreements in FY13

66 non-exclusive

20 exclusive

17 option agreements



Licenses

Then. . .

3 in 1970

Now. . .

103 in FY13

~1200 active licenses from ~3500 active inventions

~3300 cumulative licenses

some inventions have many licensees

What is in a License?*

Financial terms can include:

- License issue fee
- Annual minimum payments
- Earned royalties
- Equity (if appropriate)
- Reimbursement of patent costs

Non-financial terms can include:

- Field of Use
- Non-exclusive or exclusive rights
- Development milestones and diligence provisions

*Sample Agreement:

http://otl.stanford.edu/industry/resources/industry_res.html?headerbar=2

Equity Can be One Component of the Financial Package



About **10-15%** of OTL's licenses have an equity term.

License Agreements with Equity

OTL first took equity in 1991

11 licenses with equity in FY13

Stanford holds equity in 161 companies as a result of license agreements (as of Aug. 31, 2013)

Managed by Stanford Management Company

Liquidated soon after IPO or at merger/
acquisition

Stanford may divest equity if a licensee conducts a clinical trial at the university

Equity Cash-Out at Stanford

\$1.0M in FY13

\$370M cumulative from equity
vs. \$1.6B in total income

\$34M cumulative from non-Google equity
vs. \$1.2B in cumulative cash royalties

Licensed Inventions Can Develop into Products

that generate income
for the company



and royalty returns to
Stanford.



Income

Then...

\$50K in 1970

Now...

\$87.0M in FY13

~\$1.6B cumulative

Big Winners...

Cohen-Boyer Recombinant DNA (\$255M)

Google (\$339M)

Functional Antibodies (\$426M)

ECONOMY VALUES
PLAN RESULTS SKILLS
QUALITY LEADERSHIP
IDEAS SUCCESS GOALS MONEY
SOLUTIONS BUSINESS TRAINING
FUTURE FINANCE
PARTNERSHIP STRATEGY RISK
GROWTH INNOVATION MANAGEMENT MARKET
EXCELLENCE PRODUCTIVITY
TEAMWORK VISION

Since 1970, Stanford inventions have generated ~
\$1.6 Billion in licensing income, **BUT**

only 3 out of 10,000 inventions was a big winner
and **only 75** have generated over \$1 million.

Most Income Comes from a Few Dockets

622 inventions generated income in FY13

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graph TD; A[622 inventions generated income in FY13] --> B[42 of those generated over $100K]; B --> C[6 of those generated over $1M]; C --> D[1 invention generated over $55M];
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42 of those generated over \$100K

6 of those generated over \$1M

1 invention generated over
\$55M

Licensing Takes Time

10 to 15 years can elapse between initial invention disclosure and significant royalties

OTL Shares the Royalties

After deductions for overhead (15%) and expenses, the net cash royalties are divided:

1/3 to inventors

1/3 to inventors' departments

1/3 to inventors' school



Royalty Sharing for Equity*

In license agreements with equity, OTL typically negotiates 5% or less of the company, depending on the other financial terms.

That equity is then distributed:

15% earmarked for OTL, with the rest divided

1/3 to the inventors
(issued directly to them)

2/3 to Stanford
(designated for the OTL Research Fund and the
VPGE/OTL Graduate Education Fund)

*In order to mitigate potential institutional conflicts of interest, equity is distributed differently than cash and Stanford Management Company handles equity designated for the university (including OTL's share).

OTL Supports Operations, Patent Costs and Research

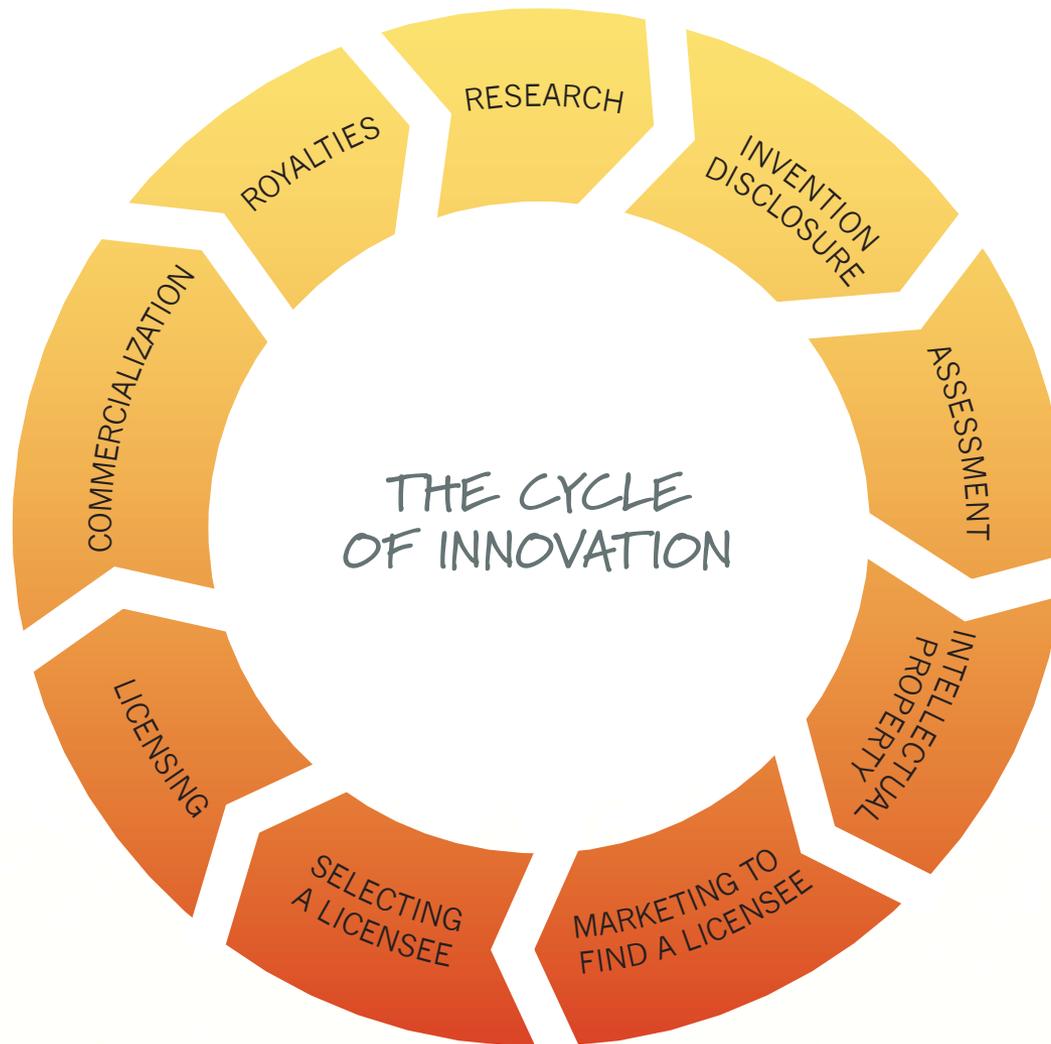


OTL's **\$6.7 million/year operating budget** is self-funded through the 15% overhead deduction from royalties.

In FY13 **patent expenses were \$9.3 million**, this was partly offset by licensing income.

OTL has **contributed \$65.9 million** collectively to the OTL Research Incentive Fund, the OTL Research Fund, and the Vice Provost of Graduate Education/OTL Graduate Fellowship Fund.

Shared Royalties Support the Next Generation of Innovation



OTL Helps Find a Home for Stanford Inventions...



to grow, develop and provide opportunities for the future.

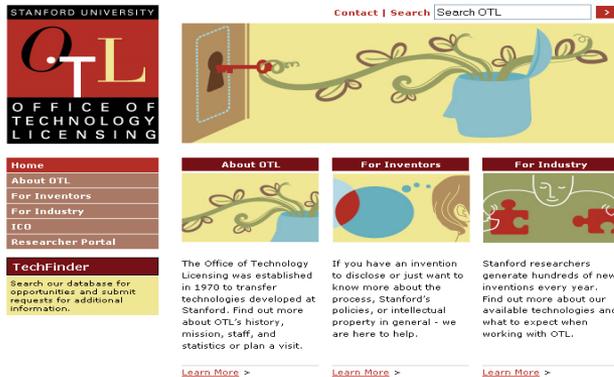
Background: OTL and the Bayh-Dole Act

~83% of research at Stanford is funded by the U.S. government

Bayh-Dole Act: Federal law that created uniform patent policy regarding inventions made under federally-funded research program.

(Council on Governmental Relations publications on intellectual property)

More Information on OTL Website



<http://otl.stanford.edu/>

Search for
new
technologies
on [Techfinder](#)

TechFinder

Search our database for opportunities and submit requests for additional information.

“The path from discovery to invention to marketplace is rarely a straight line, but more like a puzzle, with dozens of pieces that must come together in just the right configuration for success,” OTL Annual Report 2013.