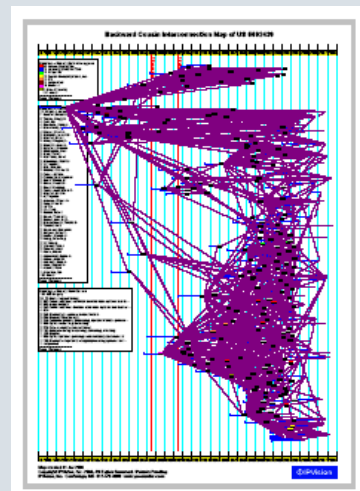


Lemelson-MIT Prize 2010
Report on Patent Portfolio of Carolyn Bertozzi
For: Lemelson-MIT Program

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IPVision
Patent Interconnection Map

Lemelson-MIT Prize 2010

Report on Patent Portfolio of Carolyn Bertozzi For: Lemelson-MIT Program

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Disclaimers

DATA LIMITATIONS; ERRORS: IPVision has prepared this report from information which to the best of our knowledge is complete and accurate. NOTE: Electronic data from the United States Patent and Trademark Office is not available for patents issued prior to 1976. IPVision makes NO REPRESENTATIONS OR WARRANTIES as this Report's completeness, accuracy or fitness for any purpose. If you find any errors in this Report please notify IPVision and we will rerun this report with corrected data if possible.

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Access to the *See-the-Forest*TM

Where there are Live Links in this report simply click on the Link and it will take you to the specific document stored at the *See-the-Forest*TM Patent Analytics website.

Important Note About Data. The analyses presented in this Report were based on data as of November 13, 2009 – i.e., the patents listed for a given company represent patents owned of record as shown at the U.S. Patent and Trademark Office databases as of that date. Patents issued to, acquired by or disposed of by such a company after November 13, 2009 will not appear in the list of patents shown in this Report or on *See-the-Forest*TM. However, patents that issue after November 13, 2009 that cite a patent shown in an analysis in this Report will appear in any citation analysis run after November 13, 2009 on the information stored on *See-the-Forest*TM. In such as case there will be an inconsistency between the results presented in this Report (which is a snapshot in time) and the results shown on *See-the-Forest*TM.

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1. THE LEMELSON-MIT PRIZE

"The \$500,000 Lemelson-MIT Prize recognizes individuals who translate their ideas into inventions and innovations that improve the world in which we live.

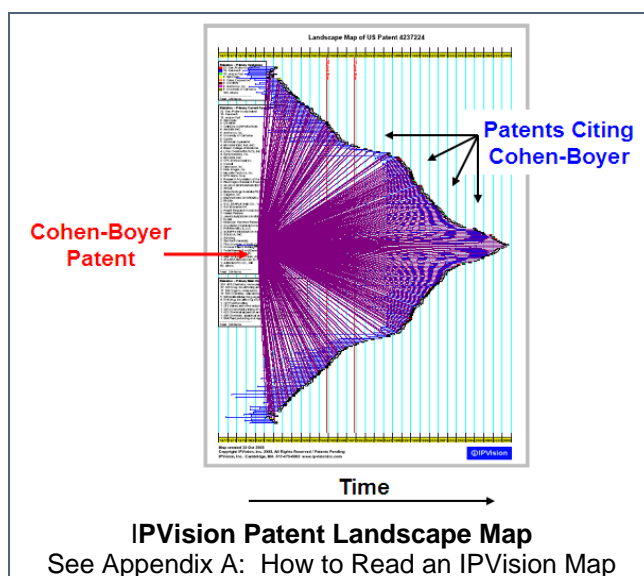
Dubbed the "Oscar for Inventors," the Lemelson-MIT Prize is awarded to outstanding mid-career inventors, who have developed a patented product or process of significant value to society, which has been adopted for practical use, or has a high probability of being adopted. By recognizing and funding younger, mid-career inventors, the prize is designed to spur inventive careers and provide role models for future generations of inventors." Source: [Lemelson-MIT Program Website](#)

2. OBJECTIVE MEASURES OF INNOVATION

One measure of the importance of an invention is the extent to which others in the field cite that invention in research papers. See for example, [Web of Science Citation Indices](#).

Patents are another form of evidence of the value of an innovation and the broadness of the commercial or societal adoption of that invention. In order to obtain a patent the inventor must show that his or her invention is "novel". Relevant prior art known to the inventor must be cited in the patent examination process. The failure of an applicant to cite relevant prior patent art can result in the patent becoming unenforceable. Accordingly, patent citations or the lack thereof have more specific economic consequences than citations of work in research papers

High Patent Citation is Evidence of Value. Many major innovations that have been patented have been highly cited by other patents. The IPVision Patent Landscape Map shown to the right is of the Cohen-Boyer gene splicing patent that launched the Biotech Industry. Stanley Cohen and Herbert Boyer were [Co-Recipients of the Lemelson-MIT Prize in 1996](#). Stanford University received over \$250m in revenue from the licensing of this patent. This patent U.S. 4,237,224 "Process for producing biologically functional molecular chimeras" had been cited over 270 times as of December 2009.



Caveat: Although high patent citation is strong evidence of the value of an innovation, this evidence must be considered relative to the age of the technology, -i.e., the time it takes for the innovation to be recognized by others. The speed of technological development in a field must also be considered.

3. CAROLYN BERTOZZI PATENT PORTFOLIO

[Dr. Carolyn Bertozzi](#) is the T.Z. and Irmgard Chu Distinguished Professor of Chemistry and Professor of Molecular and Cell Biology at UC Berkeley, an Investigator of the Howard Hughes Medical Institute, and Director of the Molecular Foundry, a nanoscience institute at the Lawrence Berkeley National Laboratory. She completed her undergraduate degree in Chemistry from Harvard University in 1988 and her Ph.D. in Chemistry from UC Berkeley in 1993. After completing postdoctoral work at UCSF in the field of cellular immunology, she joined the UC Berkeley faculty in 1996.

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Prof. Bertozzi's research interests span the disciplines of chemistry and biology with an emphasis on studies of cell surface glycosylation pertinent to disease states. Her lab focuses on profiling changes in cell surface glycosylation associated with cancer, inflammation and bacterial infection, and exploiting this information for development of diagnostic and therapeutic approaches. In addition, her group develops nanoscience-based technologies for probing cell function and for medical diagnostics.

Dr. Carolyn Bertozzi has 32 issued U.S. patents and 17 published pending U.S. patent applications (the "Bertozzi Patents"). Her top 5 most highly cited patents are:

Top 5 Most Highly Cited Patents of Bertozzi				
Patent #	Inventors	Title	Citations By (BCs)	Citations To (FCs)
5962422	Nagy, Jon O.;Spevak, Wayne R.;Dasgupta, Falguni;Bertozzi, Carolyn	Inhibition of selectin binding	1	11
5212075	Bednarski, Mark D.;Bertozzi, Carolyn R.;Nagy, Jon O.	Compositions and methods for introducing effectors to pathogens and cells	22	10
5783693	Bertozzi, Carolyn;Rosen, Steven D.	Methods for synthesizing sulfated disaccharide inhibitors of selectins	2	9
6458937	Bertozzi, Carolyn; Yarema, Kevin J.;Mahal, Lara K.	Glycoconjugates and methods	2	8
6075134	Bertozzi, Carolyn;Yarema, Kevin J.;Mahal, Lara K.	Glycoconjugates and methods	1	7

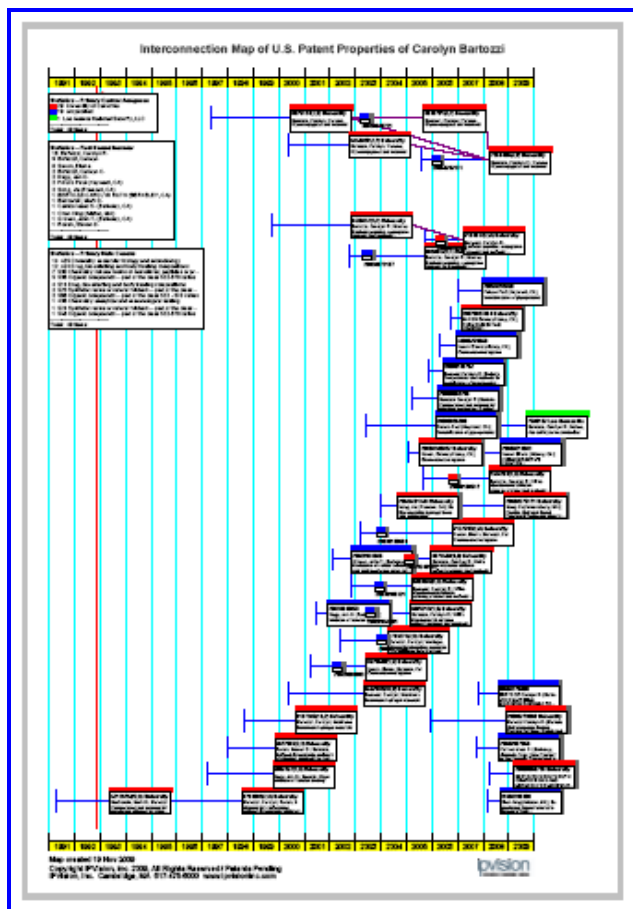
View Patents on *See-the-Forest*TM ► [Link to List](#)

3.1 BERTOZZI PATENT PORTFOLIO MAP

The following is an IPVision Interconnection MapTM showing the patent citation relationships among the 49 U.S. patent properties of Dr. Carolyn Bertozzi:

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Patent Citation Interconnection Map™ of Dr. Carolyn Bertozzi



Statistics -- Primary Current Assignees
■ 29 University of California
■ 19 unspecified
■ 1 Los Alamos National Security, LLC

Total: 49 Items

Patent Citation Interconnection Map™:
 This IPVision Patent Citation Interconnection Map™ shows the U.S. patent properties of Dr. Carolyn Bertozzi on a timeline from left to right.

Note: For information about Reading IPVision Maps, see Appendix A

[View Live IPVision Map™](#) ►

[Link to Map](#)

3.2 PATENTS CITING THE BERTOZZI PATENTS

The Bertozzi Patents are cited by 53 other U.S. patents as prior patent art (“Forward Citation Patents”).

View “List of Forward Citation Patents” on See-the-Forest™ ► [Link to List](#)

According to the U.S. Patent and Trademark Office records, the Top 10 Current Assignee/Owners of the Forward Citation Patents are:

Top 10 Forward Citation Patent Assignees	
Current Assignee Name	# Patents
Enzon, Inc.	9
Toyo Suisan Kaisha, Ltd.	9
Tripep AB	4
University of California	4
Wisconsin Alumni Research	4
Genetech	3
GlycoMimetics, Inc.	3

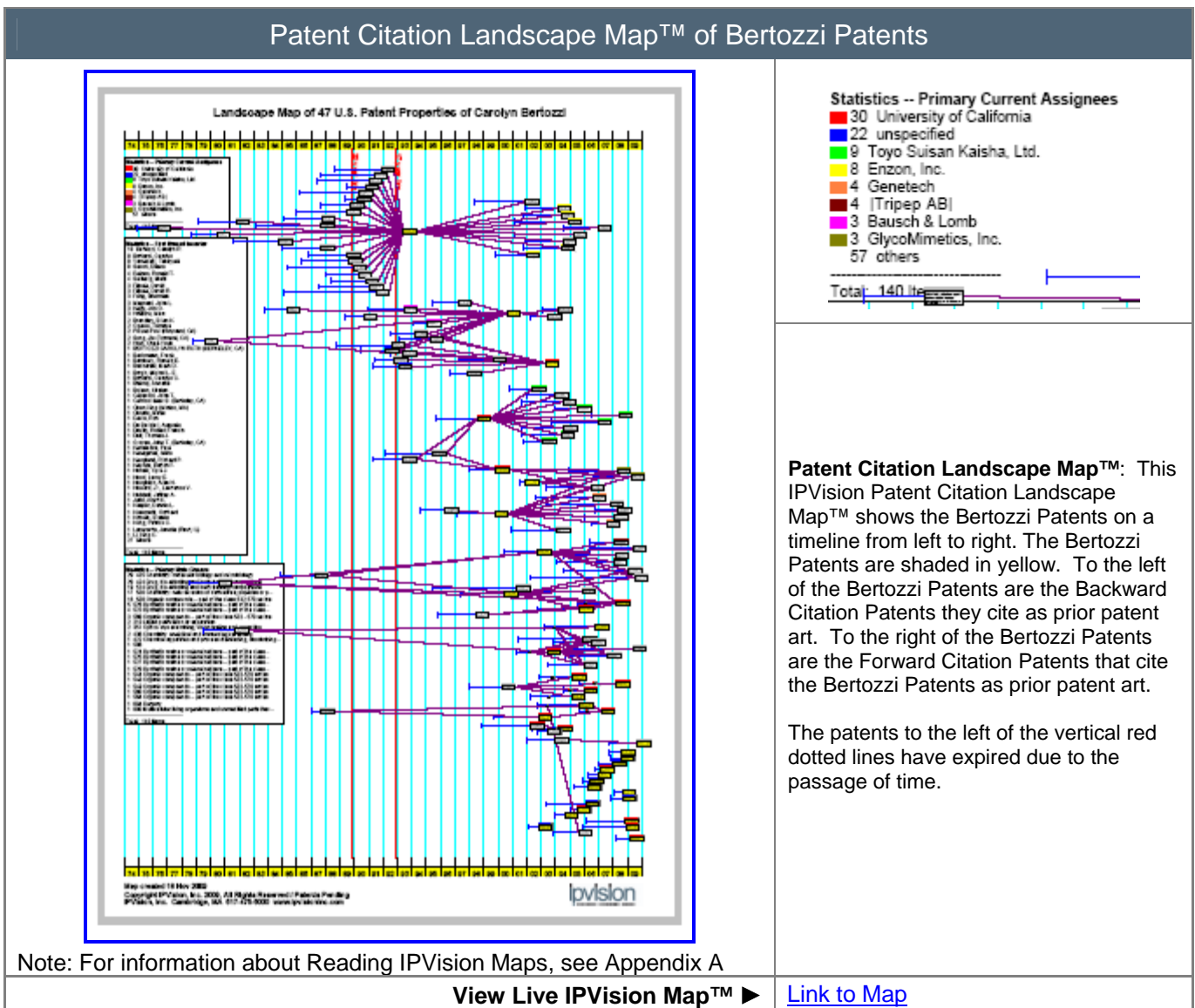
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Top 10 Forward Citation Patent Assignees	
Current Assignee Name	# Patents
Glycorex Transplantation AB	3
Millipore Corporation	3
Cornell	2

View “Forward Citation Assignee Analysis™” on See-the-Forest™ ► [Link to Analysis](#)

3.3 BERTOZZI PATENT LANDSCAPE MAP

The following is an IPVision Landscape Map™ showing the Gerngross Patents, the U.S. patents cited by the Gerngross Patents (“Backward Citation Patents” or “BCs”) and the other U.S. patents that cite the Gerngross Patents (“Forward Citation Patents” or “FCs”) as of the date of this report:



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3.4 RELATIVE CITATION OF BERTOZZI PATENTS

As mentioned above, the Bertozzi patents are cited as prior art by 53 other patents (“Forward Citation Patents”). In order to understand the relative importance from a citation viewpoint of the Bertozzi patents it is instructive to look at the total number of citations by the Forward Citation Patents.

Cohen-Boyer Example. As noted above, the famous Cohen-Boyer patent from Stanford had been cited by 227 patents as of December 2009. These 227 patents have a total of 3,121 citations of other patents or a mean average of 13.7 citations per Forward Citation Patent. However, if we look only at the first 10 years after the Cohen-Boyer patent was issued and the biotech industry was still very much in development mode, there were 117 Forward Citation Patents with a mean average of 3.7 citations each, i.e. the Cohen-Boyer patent accounted for approximately 27% (=1 / 3.7) of all patents cited by the Forward Citation Patents, clearly an indication of its relative importance.

Cohen-Boyer Patent: Relative Citation Importance					
Inventor	# Patents	#FC Patents	Avg FC/Patent	Total Citations	Mean #Citations
Cohen-Boyer	1	227	227	3,121	13.7
Cohen-Boyer 10 Years	1	117	117	437	3.7

These statistics for the Bertozzi portfolio are:

Bertozzi Portfolio: Relative Citation Importance					
Inventor	# Patent Properties	#FC Patents	Avg FC/Patent	Total Citations	Mean #Citations
Bertozzi	49	53	1.08	1,591	30.0

On these metrics the Bertozzi portfolio appears to be less unique from a patent perspective than the Cohen-Boyer patent –i.e., each patent that cited a Bertozzi patent also cited another 30 patents on average.

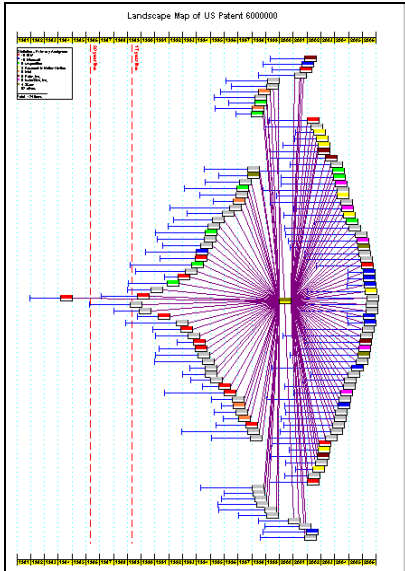
CAVEAT: these statistical comparisons are directional only. Patent citation practices have changed over the years since the Cohen-Boyer patent was issued in December 1980. In addition, the rates of patent citation vary in different technical fields and at different times in the evolution of a technology area.

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APPENDICES AND EXHIBITS

APPENDIX A – HOW TO READ AN IPVISION MAP

An IPVision Map is a visual representation of the relationships between objects. The following is an example of a Landscape Map for a single U.S. Patent:



This Landscape Map is of U.S. Patent 6,000,000 entitled “Extendible method and apparatus for synchronizing multiple files on two different computer systems”. It is the basic patent for the Palm Pilot software.

The horizontal X axis is “time”

Patent 6000000 is in the middle of the “fan”. The lines going backward (to the left) are the patents cited by Patent 6000000 and the lines going forward (to the right) show the patents which cite Patent 6000000.

The details of an IPVision Map are explained in more detail below

