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LAUNCHING IDEAS

Mothers of Invention: The History and Future of Women Inventors

March 12, 2015

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Why Dig Up the Not-so-nice Past?

- The suppression and oppression of women is real; and it is not gone
- We can see it and the injustice of it more easily in the extremes of the past
- By looking back we can celebrate women's progress, and resolve to continue the fight for equality

"Women's Work" Didn't Include Inventing

- No woman signed the Declaration of Independence
- Women were expected to tend to the home, farm chores and children
- Few owned property or had money
- Women couldn't vote until 1920
- Yet women received over 1,200 patents between 1809 and 1892!

The Story Has to be Told by W0men

- Maryanne Laukaitis
- Lyne Laliberte
- Ling Shen
- Burnley Jaklevic

Patents In The Early U.S.

- Early in US history men received patents for inventions which were originated and developed by wives, daughters, or female relatives.
- Why: Social pressure, economic$, lack of education, lack of legal rights, “inappropriate”
- 1809 to 1840: about 20 U.S. patents were issued to women.
- 1841+: Many women’s patents were for items to ease the burden of chores, childcare and for apparel. (Ice cream freezer, corsets, baby-jumper, door lock, nursing bottle…)

Colonial Woman Inventor Recognized

- **Sybilla Masters**, in 1715 a patent was granted to her husband by the King of England for HER improved corn “cleaning and curing” for flour, her method & machinery.
- Also granted a patent for method of palmetto weaving, had profitable hat shop.

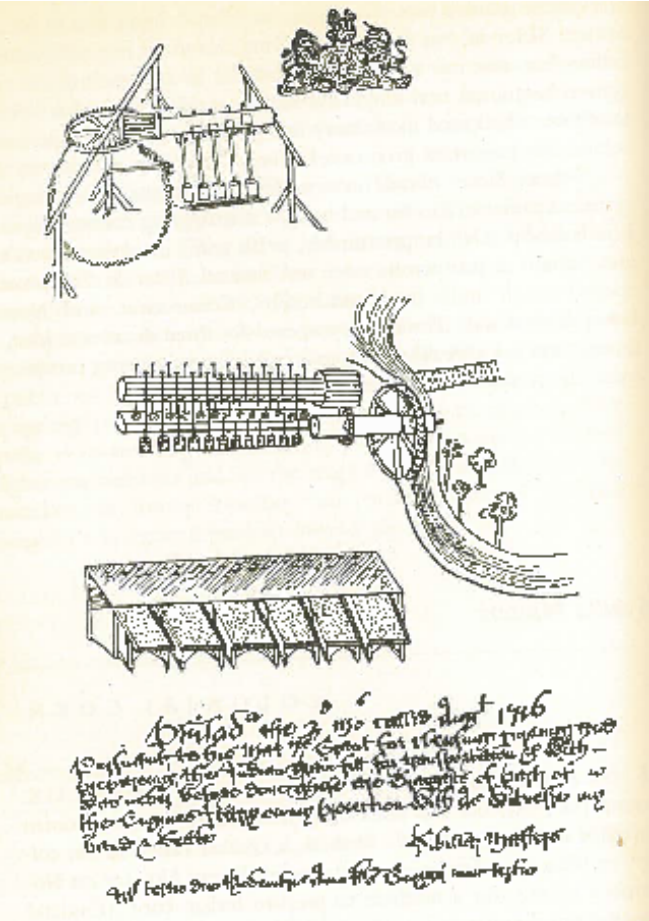


Illustration from “Mothers of Invention” by Ethlie Ann Vare & Greg Ptacek (1988)

First Woman U.S. Patent Holder

- **Hannah Wilkinson Slater** – 1793 first woman to be awarded a patent - for improved cotton thread
- Wife of Samuel Slater, Father of American Manufactures – textile mogul
- Died 1812

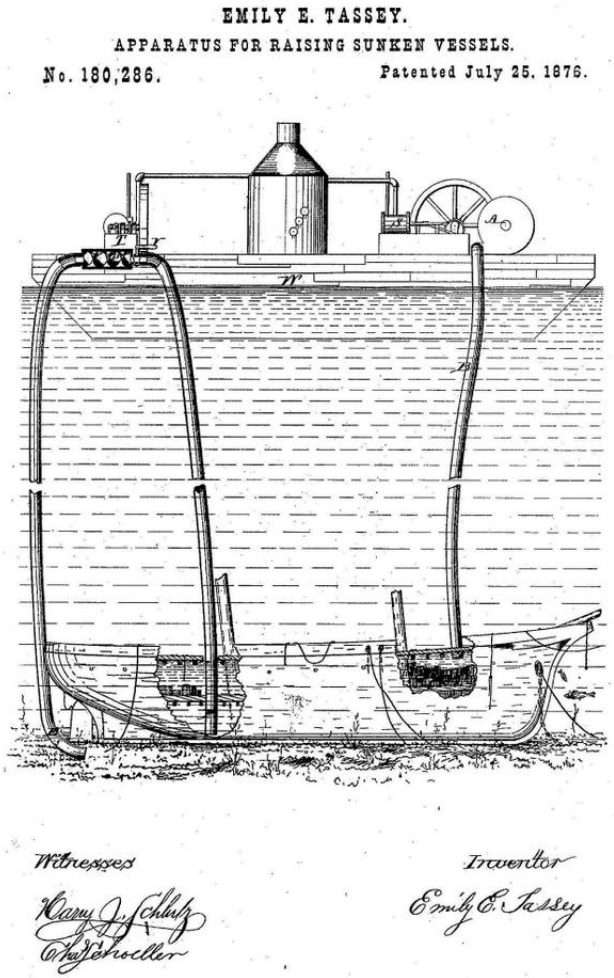
Second “First” Woman U.S. Patent Holder

- **Mary Dixon Kies** of Killingly, CT - US X1040 “In Weaving Straw with Silk or Thread” on May 5, 1809.
- Only Known copy of this patent destroyed in US patent office fire of 1836
- Died at 85 years, penniless 1837, at her son’s Brooklyn home

USPTO Tweets #womeninventors –USPTO.gov

- **Emily Tassey**
  "Apparatus for Raising Sunken Vessels"
  #180,286

- Today in #Patent History: July 25, 1876, Emily Tassey proved #invention wasn't just an old buoys club #womeninventors http://t.co/k72qUkw4cP

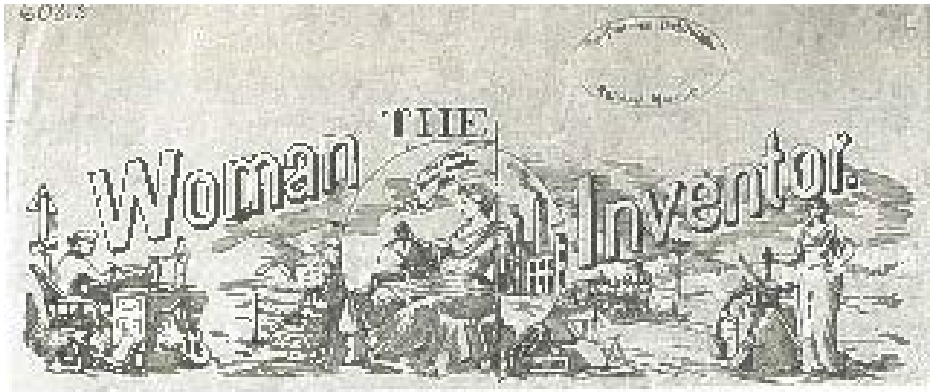


"Raising More Hell and Fewer Dahlias"

- In 1883, persuaded by **Charlotte Odlum Smith**, the US Patent Office issued a list of women patent holders to date. (WEB DuBois Library has a copy available.)
- A Business woman, reformer and suffragist
- A Champion for labor and authority on working conditions
- Magazine publisher of "Inland Monthly" & "Woman Inventor"

Black Woman Invents a Clothes Wringer

- **Ellen F. Eglin,** Washington D.C. A housekeeper in the 1880s, invented a special type of clothes wringer. Eglin sold her idea for a mere $18.00.
- "You know I am black and if it was known that a Negro woman patented the invention, white ladies would not buy the wringer. I was afraid to be known because of my color in having it introduced into the market, that is the only reason." Quote from "Woman Inventor" magazine.



Masthead of Charlotte Smith's *The Woman Inventor*.

Brains and Glamourous Movie Star

- **Hedy Lamarr** (born Hedwig Eva Maria Kiesler) (1914 - 2000)
- With composer Geo. Antheil, invented spread-spectrum/ frequency hopping, anti-jamming for torpedoes.
- Pat. 1942, not used until Cuban Missile Crisis – after patent expired.
- Basis for modern technology – Bluetooth, Wi-Fi connections, some cordless and wireless phones.

First African American Female Dr. to Patent

Patricia Era Bath, MD grew up in Harlem, Ophthalmologist.

Cataracts were once removed by mechanical grinding!

Invented Cataract Laserphaco Probe

Apparatus and methods are used to quickly, accurately and painlessly vaporize cataract lenses from patients' eyes. An artificial lens is then implanted.

Founder and first president of the American Institute for the Prevention of Blindness.

New Film Developing Method

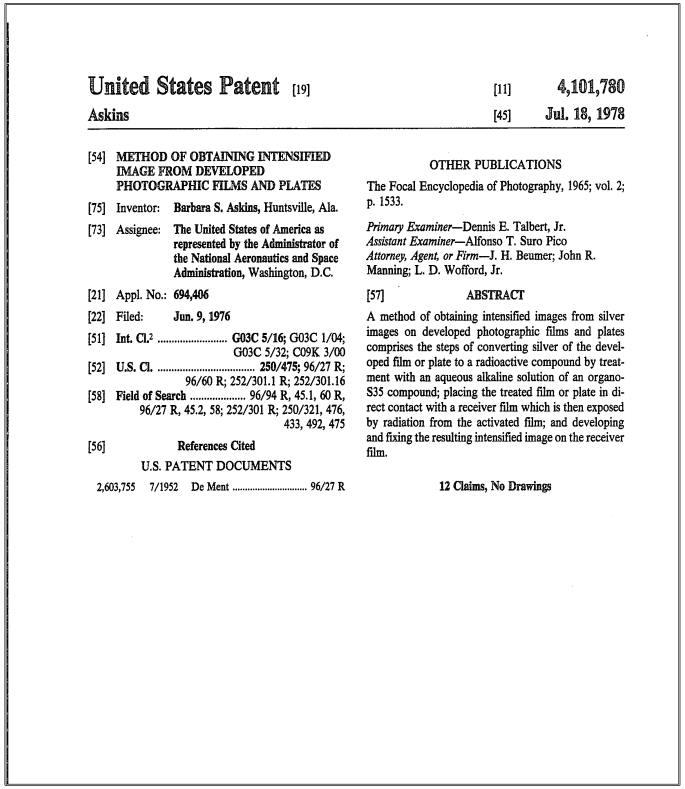
Barbara Askins

- BS and MS Chemistry, University of Alabama
- Hired by NASA to improve quality of space photographs

New Film Developing Method

- Process has also been used to greatly improve the clarity of x-rays and restore old photographs
- 1978 National Inventor of the Year

US Patent No. 4,101,780



United States Patent [19]
Askins

[11] 4,101,780
[45] Jul. 18, 1978

[54] METHOD OF OBTAINING INTENSIFIED IMAGE FROM DEVELOPED PHOTOGRAPHIC FILMS AND PLATES

[75] Inventor: Barbara S. Askins, Huntsville, Ala.

[73] Assignee: The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

[21] Appl. No.: 694,406

[22] Filed: Jun. 9, 1976

[51] Int. Cl.[2] G03C 5/16; G03C 1/04; G03C 5/32; C09K 3/00

[52] U.S. Cl. ..... 250/475; 96/27 R; 96/60 R; 252/301.1 R; 252/301.16

[58] Field of Search ..... 96/94 R, 45.1, 60 R, 96/27 R, 45.2, 58; 252/301 R; 250/321, 476, 433, 492, 475

[56] References Cited

U.S. PATENT DOCUMENTS

2,603,755 7/1952 De Ment ..... 96/27 R

OTHER PUBLICATIONS

The Focal Encyclopedia of Photography, 1965; vol. 2; p. 1533.

Primary Examiner—Dennis E. Talbert, Jr.
Assistant Examiner—Alfonso T. Suro Pico
Attorney, Agent, or Firm—J. H. Beumer; John R. Manning; L. D. Wofford, Jr.

[57] ABSTRACT

A method of obtaining intensified images from silver images on developed photographic films and plates comprises the steps of converting silver of the developed film or plate to a radioactive compound by treatment with an aqueous alkaline solution of an organo-S35 compound; placing the treated film or plate in direct contact with a receiver film which is then exposed by radiation from the activated film; and developing and fixing the resulting intensified image on the receiver film.

12 Claims, No Drawings

Spanning Tree Protocol (STP)

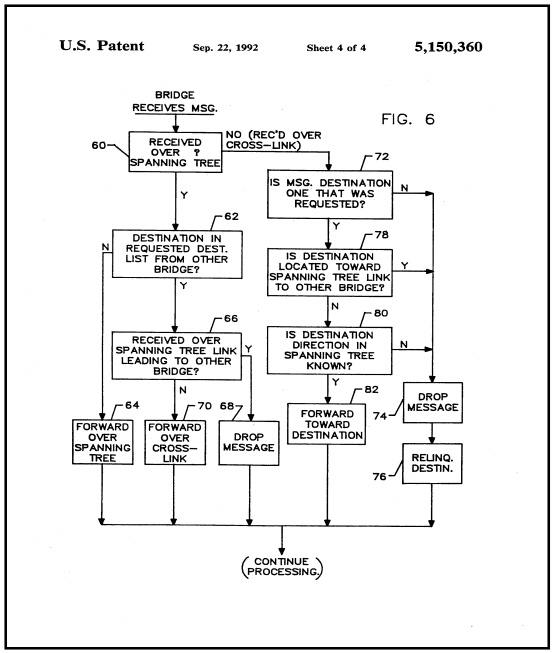
Radia Perlman, Ph.D.

- BS, MS & PhD - MIT
- Silicon Valley IP Inventor of the Year
- Women of Vision Award for Innovation

Spanning Tree Protocol (STP)

- STP technology fundamental to operation of network bridges
- Often referred to as the "Mother of the Internet"
- Holds more than 100 issued patents
- Currently a fellow at EMC² Corporation

US Patent 5,150,360



Directed Evolution of Enzymes

Frances Arnold, Ph.D.

- BS in Mech. Eng. Princeton
- PhD in Chem. Eng. UC-Berkeley
- National Medal Technology & Innovation
- National Inventors Hall of Fame 2014

Directed Evolution of Enzymes

- Technology accelerates the evolution of enzymes and has many applications
- Co-founded bio-fuel company Gevo, Inc.
- Currently professor of chemical engineering & biochemistry at Caltech

Gyro Bowl™

Melinda Shepard

Regular folks are inventors too!

GyroBowl™

Gyro Bowl™

- Saw the need for a spill proof food container for her toddler
- Came up with a prototype
- Idea was chosen for the PBS tv show "Everyday Edisons" http://www.everydayedisons.com/
- She and her husband now have a very nice college fund for their kids

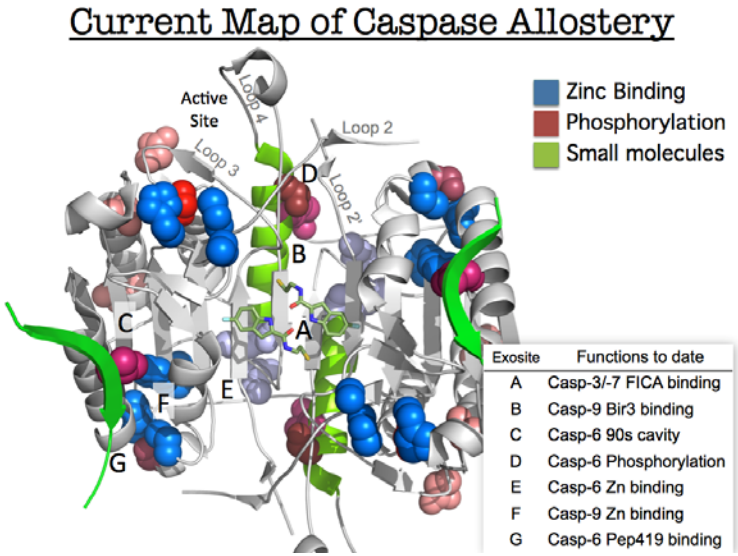
UMass Amherst Female Lead Inventors

- Kathleen Arcaro
- Surita Bhatia
- Patricia Bianconi
- Beatrice Botch
- Laura Cadonati
- Maura Cannon
- Min Chen
- Michelle DaCosta
- Roberta Day
- Andrea Foulkes
- **Aura Ganz**
- Julie Goddard
- **Jeanne Hardy**
- Lili He
- Cynthia Jacelon
- Ljilijana Korugic-Karasz
- Susan Leschine
- Lynne McLandsborough
- Lisa Minter
- Kelly Nevin
- Barbara Osborne
- Yooheon Park
- Sandra Petersen
- Shelly Peyton
- **Margaret "Peg" Riley**
- Susan Roberts
- Jennifer Ross
- Ana Maria Salicioni
- **Maria Santore**
- **Jessica Schiffman**
- Hava Siegelmann
- Cindy Stein
- Elizabeth Stuart
- **YuYing Tang**
- Annette Wysocki

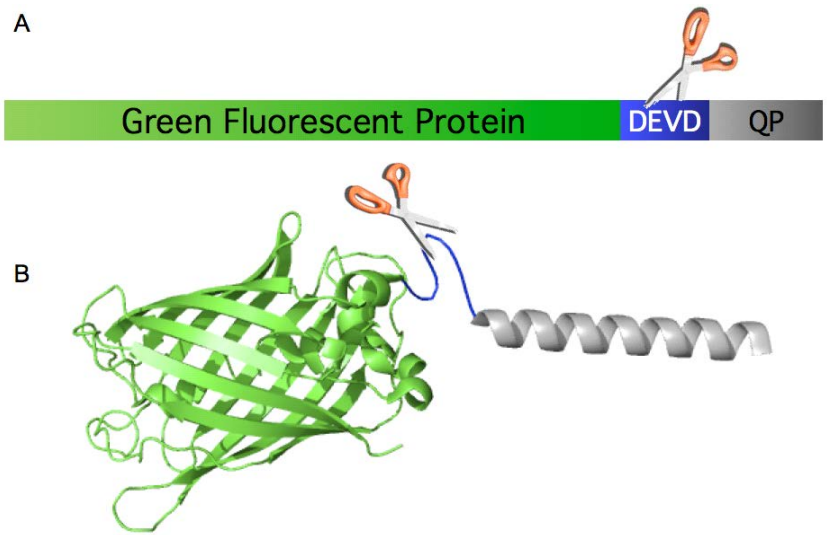
A Useful Tool for Target and Drug Discovery

Jeanne Hardy, Ph.D.
Associate Professor
Department of Chemistry
UMass Amherst

- Principal research interests: design and develop allosteric proteins to regulate protein activity; study the roles of proteins (caspases) involved in the process of programmed cell death



A Useful Tool for Target and Drug Discovery



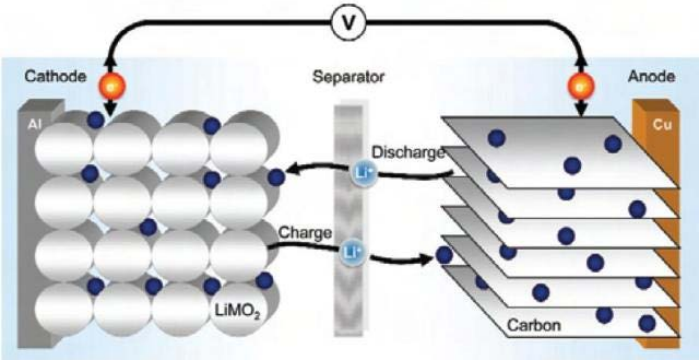
- In 2009, invented a fluorescent reporter for caspase activity
- The fluorescent reporter material was licensed for research use.

Safer, High-Performance Lithium-Ion Batteries

YuYing Tang, Ph.D.
Director, Roll-to-Roll Processing Lab
Center for Hierarchical Manufacturing
UMass Amherst

- ~12 years of industry experience
- Founder of a startup company
- In 2011, invented hybrid electrolyte/separator materials for battery applications
- Patent applications filed and licensed to a global company

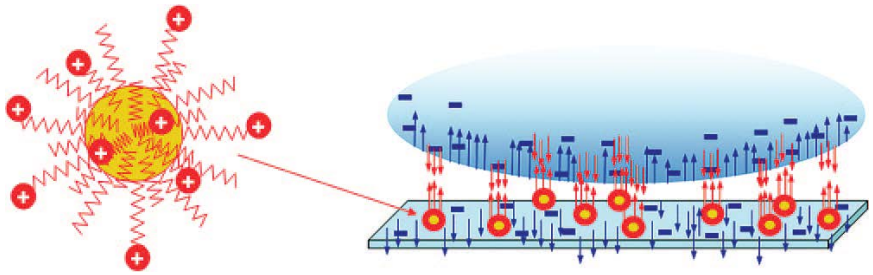
Schematic of a Li-ion battery



Smart, Renewable Surfaces As Sensors for Bacteria

Maria Santore, Ph.D.
Professor
Department of Polymer Science and Engineering
UMass Amherst

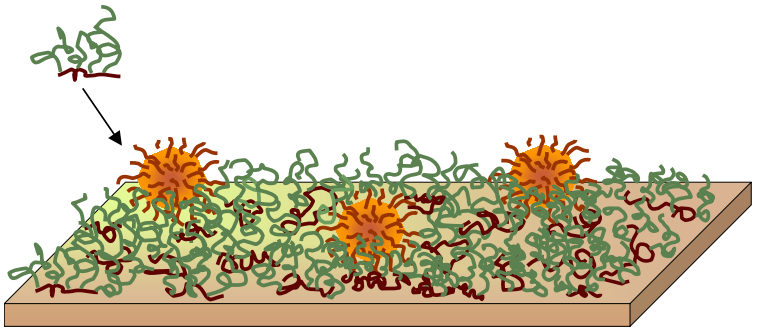
- Principal research interests: surface design, adhesion and dynamics
- Invented engineered surfaces for analyte sensing and separation (4 U.S. Patents)

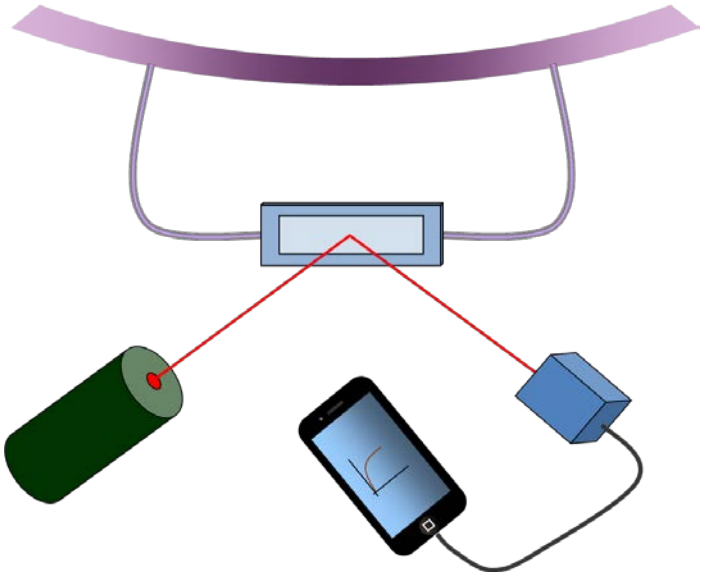


Langmuir 2009, 25, 84-96

Smart, Renewable Surfaces As Sensors for Bacteria

- In 2013, invented renewable surfaces for continuous sensing of bacteria





Natural Materials for Wound Care

Jessica Schiffman, Ph.D.

Assistant Professor, James M. Douglas Career Development Faculty Fellow

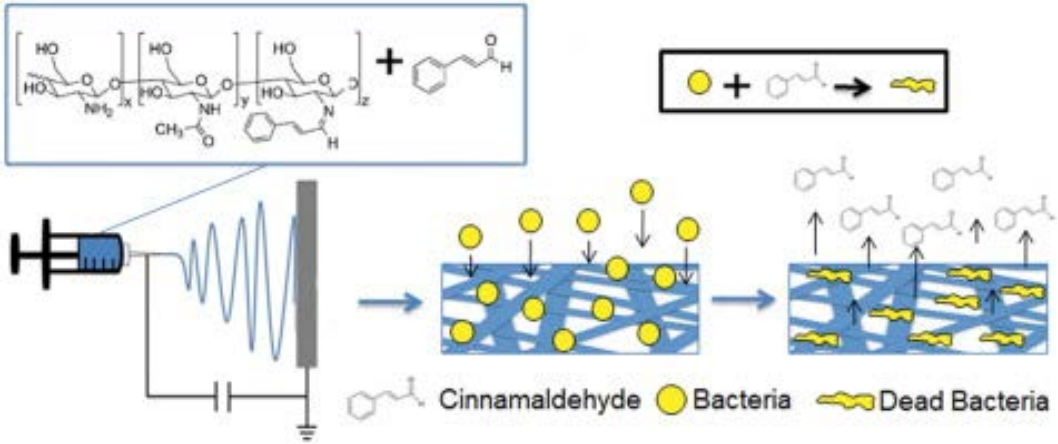
Department of Chemical Engineering, UMass Amherst

Katrina Rieger

ChemEng Graduate Student, 2011-Current

Department of Chemical Engineering, UMass Amherst

Natural Materials for Wound Care



- Technology based on chitosan and cinnamon compound
- Katrina used technology to participate in UMass Innovation Challenge
- Patent application filed and UMass exploring opportunity with MA-based company

Bacterial Proteins to Prevent Bacterial Infections

Margaret (Peg) Riley, Ph.D.

- Professor, Department of Biology, UMass Amherst
- President of Massachusetts Academy of Sciences
- Founder of Bacteriotix, LLC

Sandy Roy

- Graduate Student and Laboratory Manager, Department of Biology, UMass Amherst
- Founder of Bacteriotix, LLC

Bacterial Proteins to Prevent Bacterial Mastitis

Mastitis is the inflammation of the mammary gland and udder tissue

- In 2014, Riley lab received sponsored research funding from animal health care company
- Identified bacterial peptides to kill mastitis causing bacteria
- Company interested in obtaining rights in Riley and Roy's technology

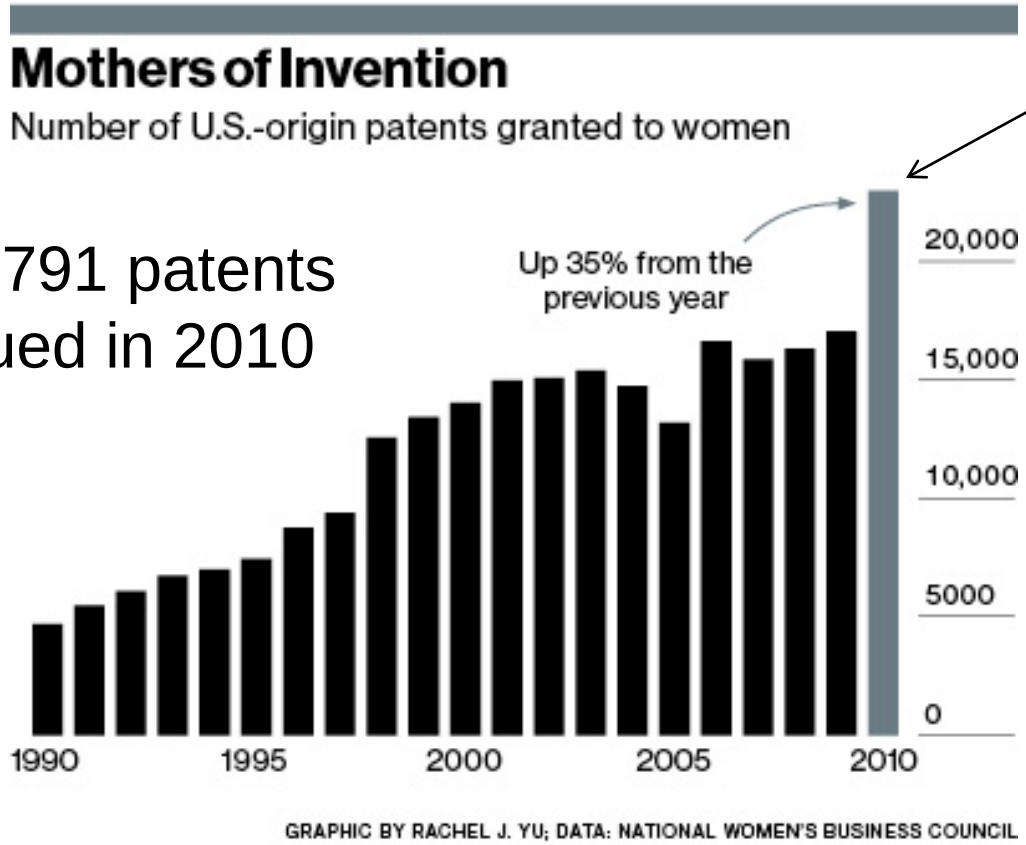
Indoor Navigation System for Visually Impaired

Aura Ganz, Ph.D.

- Professor, Electrical and Computer Engineering, UMass Amherst
- Director 5G Mobilization Lab

- Indoor navigation system for visually impaired (PERCEPT)
- Tags located throughout buildings that can generate step by step instructions by interfacing with users smartphone
- Installed in 2 buildings on campus
- MBTA conducting pilot test at Arlington station

Progress?



107,791 patents Issued in 2010

23% Of Those Issued

So Please Invent Something!

- There are women inventors at UMass we haven't heard from! We are here to help you.
- We want to start something big!
- Please come see us, call us, email us, come to our seminars, and get involved

THANKS!

For more interesting information on women inventors, follow #womeninventors on Twitter