

## *Declining Public Trust in FDA*



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Panel faults way FDA approves new drugs  
*The Washington Post*

Generics Face Longer Wait for Approval

Despite law, drug safety still a concern at FDA  
Reuters

*The New York Times*

Political Lobbying Drove FDA Process

THE WALL STREET JOURNAL

FDA's new policies threaten innovation

*Los Angeles Times*

Politicizing the FDA

*The Washington Post*

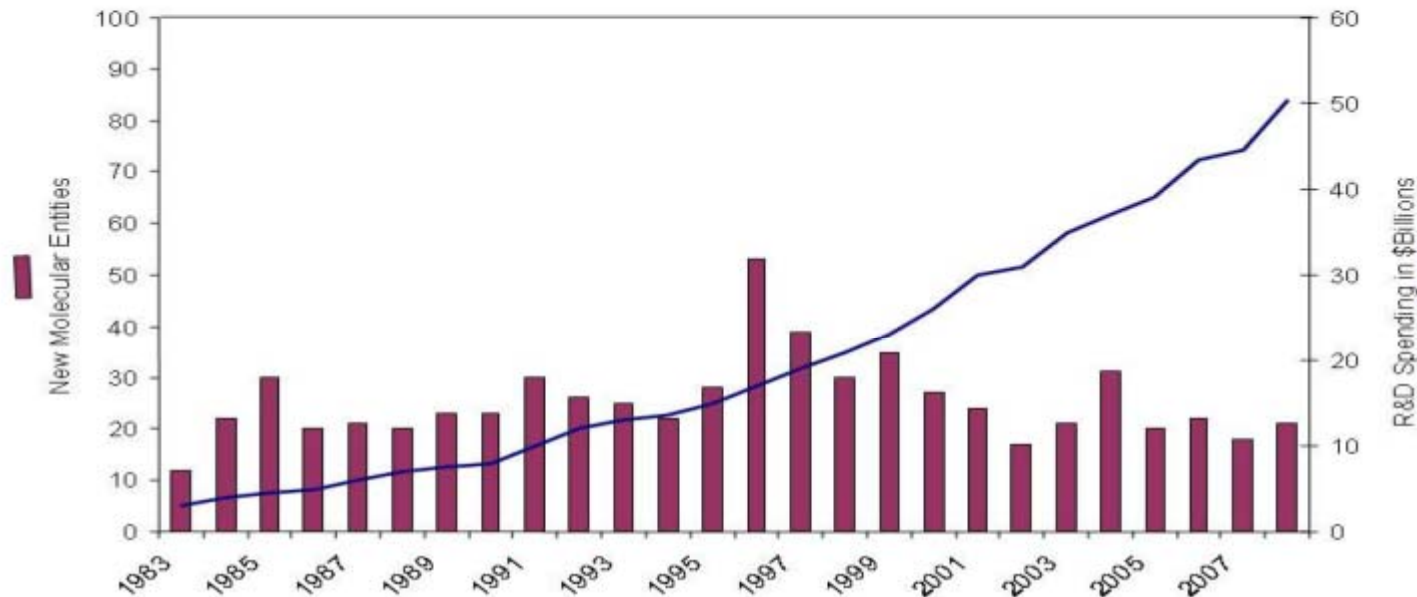
...a Dysfunctional FDA-AP  
Scientists Say FDA Ignored Radiation Warnings

*The New York Times*

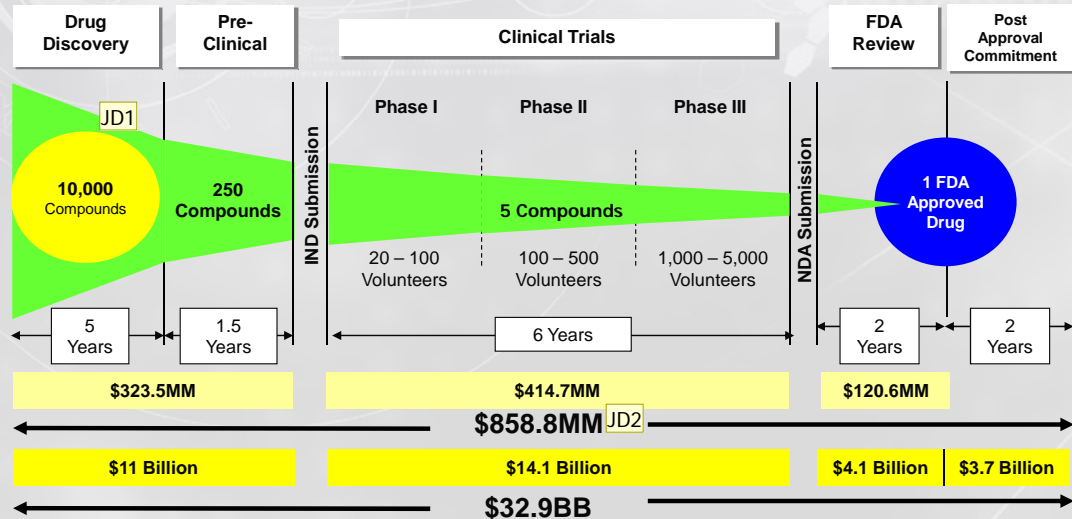
THE WALL STREET JOURNAL

FDA Faces More Pressure to Pull Avandia

# US pharmaceutical R&D spending and productivity over time



# The risky, unpredictable and costly pathway to new drug approval

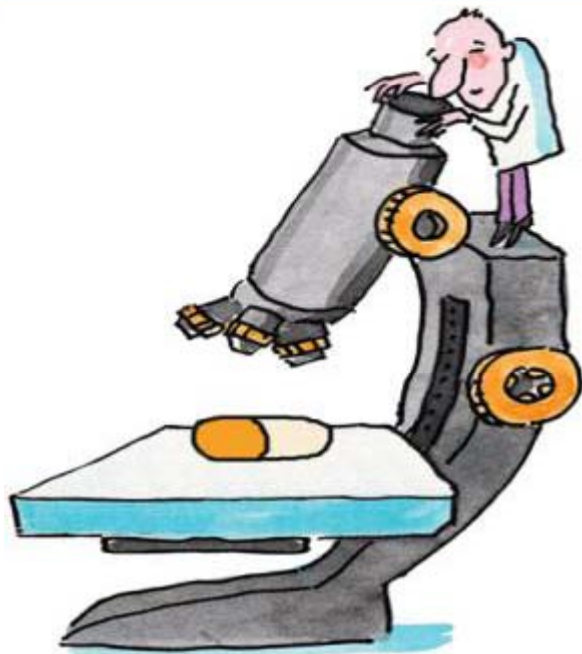


\*PhRMA 2003 R&D Expenditures; average of data from 34 members; excludes Phase IV expenses and "uncategorized" expenditures; (\$MM)

# New Drug Application (NDA)



# Increasing focus on safety

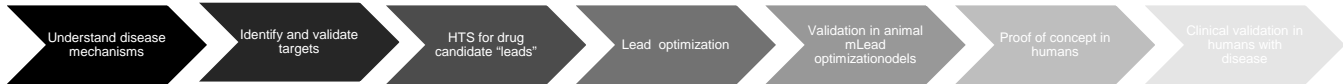


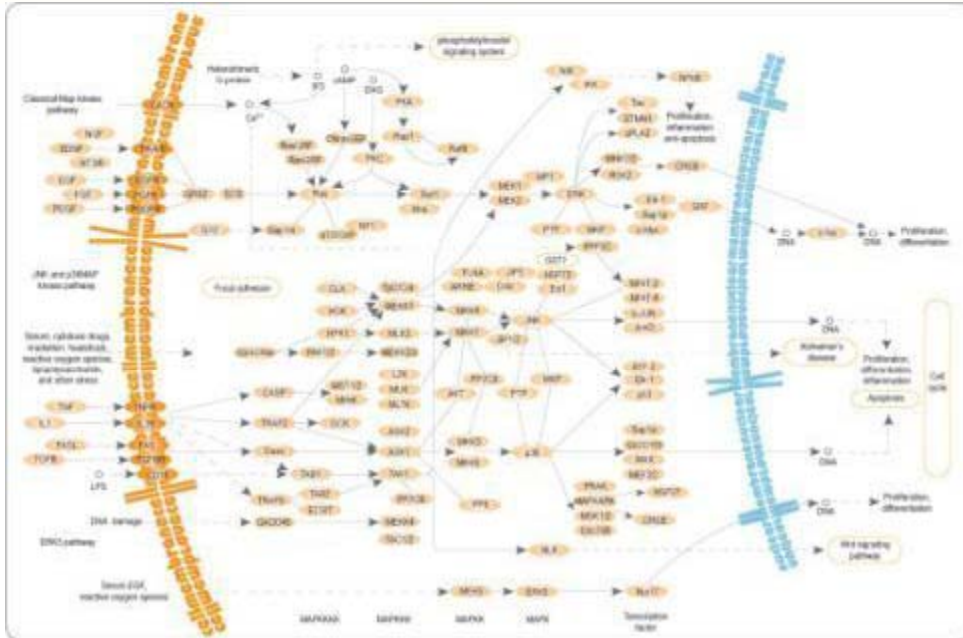
# Drug discovery paradigms have changed

## Old paradigm

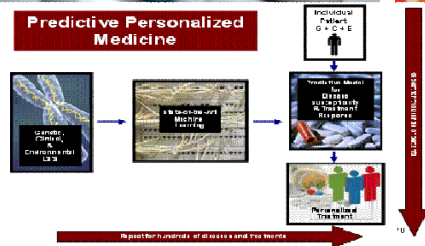
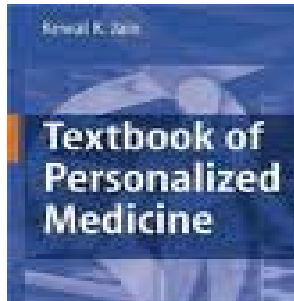


## New paradigm



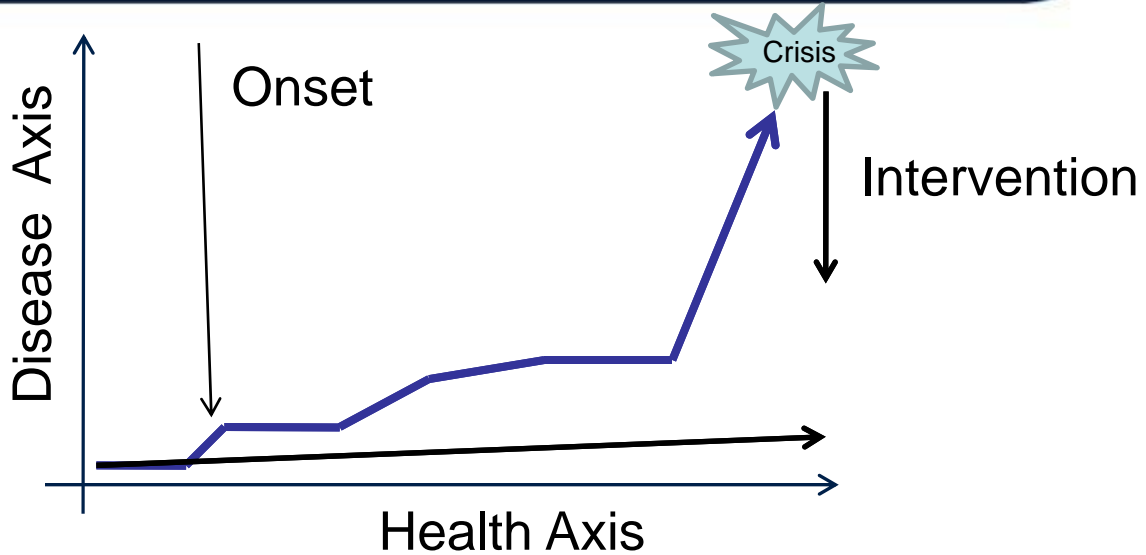
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# New paradigms: Personalized Medicine





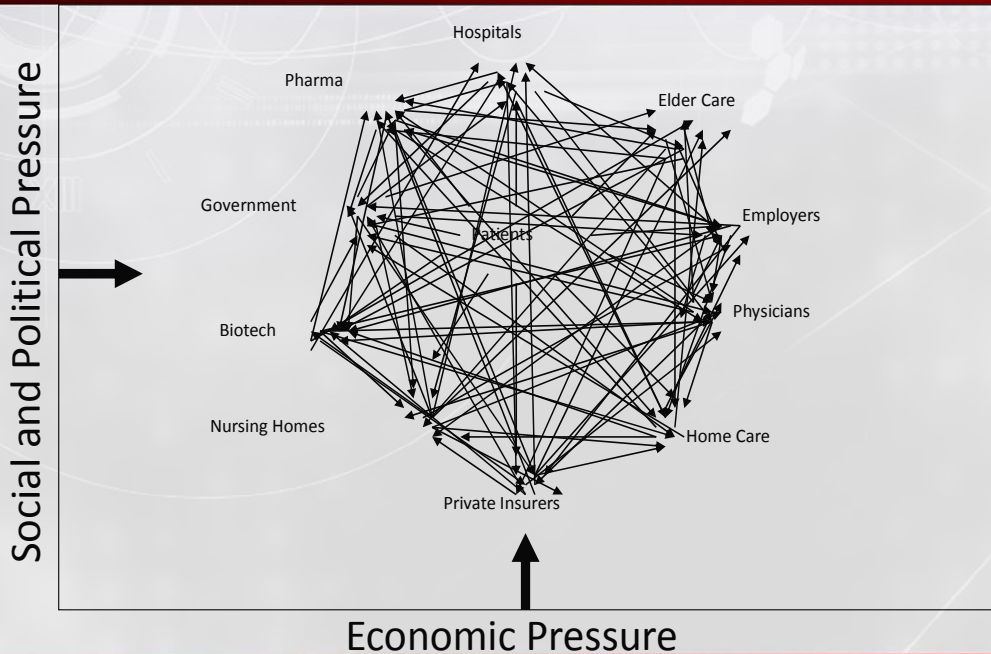
# Earlier intervention



# Reduce Complexity



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**New products must be affordable!**

“The greatest downside to research isn’t failure but unaffordable success.”



**Dr. Kevin Murphy, University of Chicago**

# Need for consistency and clarity - throughout the cycle



- Avoid “disclarity” and moving goalposts
- Uncertainty repels investment in needed therapies
- Need for continuous open dialog with *all* regulatory authorities and payers

**We need to use the appropriate instruments  
for medical decision making**



**VS.**



# About the Food and Drug Administration

- Last year, the U.S. spent **more than twice as much on potato chips (\$5.3 billion) than it did for the FDA (\$2.35 billion)**, an agency that regulates products that represent 25% every consumer dollar.
- Between 1996 and 2009, over 50 legislative Acts have added new responsibilities to the FDA's plate – such as generic biologic review, adverse event tracking, drug import field exams, and foreign manufacturing facility review – many in the form of unfunded mandates.
- Twenty-five years ago, the FDA and the Centers for Disease Control and Prevention (CDC) were roughly the same size, but since that time, the CDC's compound annual growth rate has grown to nearly double that of FDA.

A person is running on a sandy beach towards the ocean. The person is wearing a light-colored, short-sleeved shirt and shorts. Their arms are outstretched, and they appear to be in motion. The background shows a bright sky with some clouds and the ocean in the distance. The overall scene is bright and energetic.

nonprofit **think tank and  
catalyst for action** that  
*works across sectors and diseases*  
to improve the effectiveness and efficiency  
of the medical research system

# Get Involved with *FasterCures*



***FasterCures.org***

Visit us online and get the latest *FasterCures* information, publications, and other multimedia resources

***SMARTBRIEF***

Stay informed, get relevant, up-to-date news stories in biomedical research delivered to you twice-weekly

***FasterCuresBlog***

We want to hear from you. Respond and comment on our blogs about the latest issues, trends, and findings that impact medical research and discovery

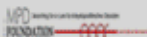
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# New Business Models to Accelerate Research



## TRAIN

### THE RESEARCH ACCELERATION AND INNOVATION NETWORK

Established to create opportunities for medical research innovators to discuss and tackle challenges that cut across diseases. It is a group of unique nonprofit foundations that fund medical research across a spectrum of diseases.

CATALYZING INNOVATION IN MEDICAL RESEARCH



# Online Platform for Venture Philanthropy in Medical Research



[www.fastercures.org/train](http://www.fastercures.org/train)



## Venture philanthropy in medical research:

Nonprofit disease research organizations that apply innovative approaches in the way they fund and conduct medical research. These groups are diversifying our national research portfolio through:

- *strategic use of capital;*
- *building collaborations;*
- *streamlining the grantmaking process;*
- *sharing information.*

“FasterCures developed TRAIN Central Station to be the online platform to help these groups more easily and effectively support each other's efforts to produce better and faster results, and to bring their sense of urgency about conductive bench-to-bedside translational research to the entire medical community as well as to the public at large.”

- Margaret Anderson, Executive Director, FasterCures



## TRAIN Central Station

TRAIN Central Station is the online platform for venture philanthropists in medical research to come together to share best practices, exchange ideas, and find relevant tools and resources.

### Webinar:

- Accessing Shelled Compounds Through the CTSA Pharmaceutical Assets Portal

### Case Studies:

- Bob Beal on the Cystic Fibrosis Foundation
- Kathy Gust on the Multiple Myeloma Research Consortium

### Tools and Resources:

- **Publication:** Entrepreneurs For Cures: The Critical Need for Innovative Approaches to Disease Research
- **Tool:** Cystic Fibrosis Foundation Therapeutics Deal Checklist

### TRAIN Current News

- Stay current on news for and about nonprofit disease research organizations.

# JOINUS

## PARTNERINGFORCURES

Bridging the Chasm Between Microscope and Marketplace

DECEMBER 13-15, 2010 GRAND HYATT NEW YORK [WWW.PARTNERINGFORCURES.ORG](http://WWW.PARTNERINGFORCURES.ORG)

An effort designed to facilitate cross-sector collaborations needed to turn a scientific discovery into an accessible therapy.

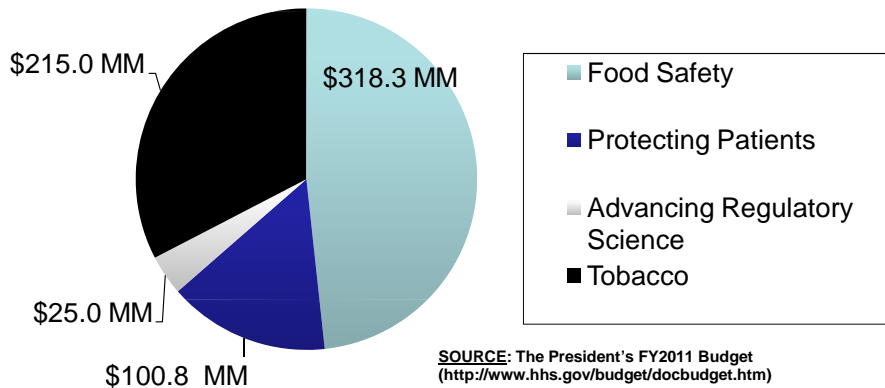
Be a part of an effort that brings together people with the expertise, experience, and creativity needed to transform the medical research system.



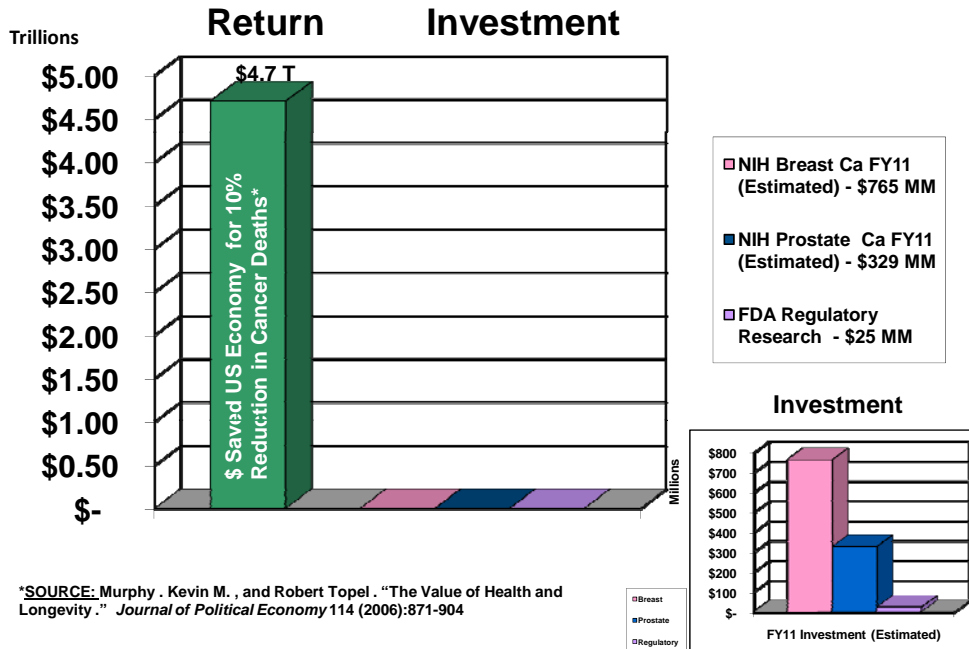


## FY11 Budget Request \$4.03 Billion

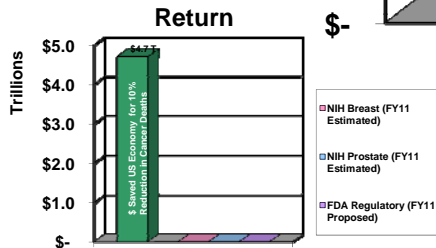
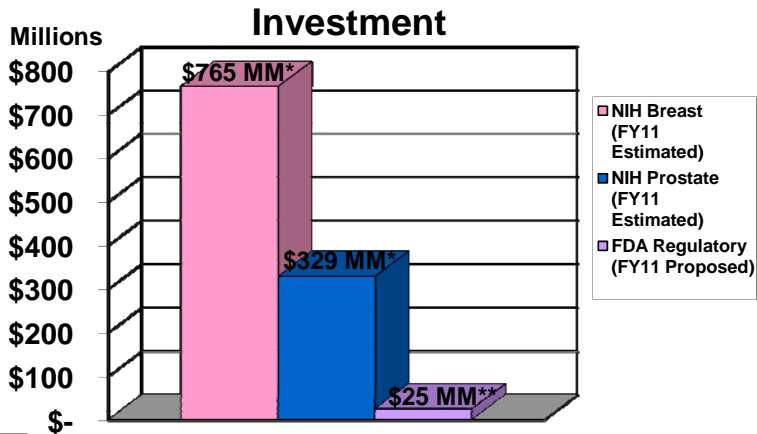
**\$4.03 Billion U.S. Food and Drug Administration Request**  
= \$3.28 billion FY10 + 23% increase (chart below)



# Imbalance: Return v. Investment



# Return v. Investment



\*SOURCE: National Institutes of Health. "Estimates of Funding for Various Research, Condition, and Disease Categories (RCDC)." February 1, 2010: RePORT. (<http://report.nih.gov/rcdc/categories>).

\*\*SOURCE: The President's Budget for the FDA (<http://www.hhs.gov/budget/docbudget.htm>)

## Return v. Investment

- If 100% of FDA funds total devoted to regulatory science were mobilized to effectively reduce breast cancer deaths by 10% . . .

\$25 MM

\$765 MM

100% of FDA Regulatory Science all human disease clinical research FY2011 translates to 3% of the NIH Research Investment in Breast Cancer

“You need to spend more than twice as much interpreting the experiment as doing the experiment.” Richard Feynman

# Declining Number of Approvals

- Regulatory disconnects RxSciences (science) and drug development (investors) and reimbursement (policy)

**Overselling in the markets of science and commerce:  
one gene, one drug, one  
blockbuster drug**



**The Counter-Example: Tuberculosis  
4 Drugs Co-targeting 1952-1960**



# Declining Number of Approvals



- Scientific disconnect between animal models and actual human cancer (biomedical entitlement complacency)
- Disconnect between the bar for “safe” and approval for “effective”



The Counter-Example: Tuberculosis  
4 Drugs Co-targeting 1952-1960

# Derisk: Personalized Oncology



- Increasing regulatory science “derisks” treatment r+d for patients, doctors, investors, and economy at large
- Derisk is an invented word to meet a new need



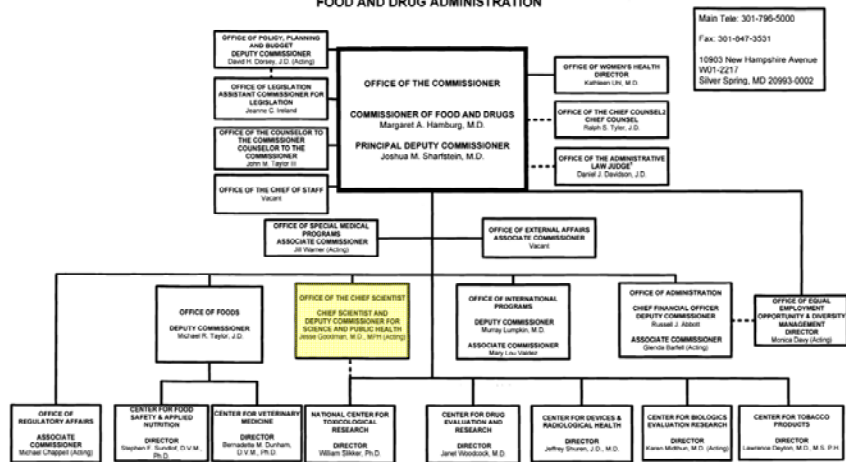
- Derisk is RxScience



# The Food and Drug Administration



## DEPARTMENT OF HEALTH AND HUMAN SERVICES FOOD AND DRUG ADMINISTRATION



<sup>1</sup> Reports Directly to the Secretary, HHS

<sup>2</sup> Reports to the General Counsel of the HHS, advises the Commissioner of Food and Drugs

January 25, 2010

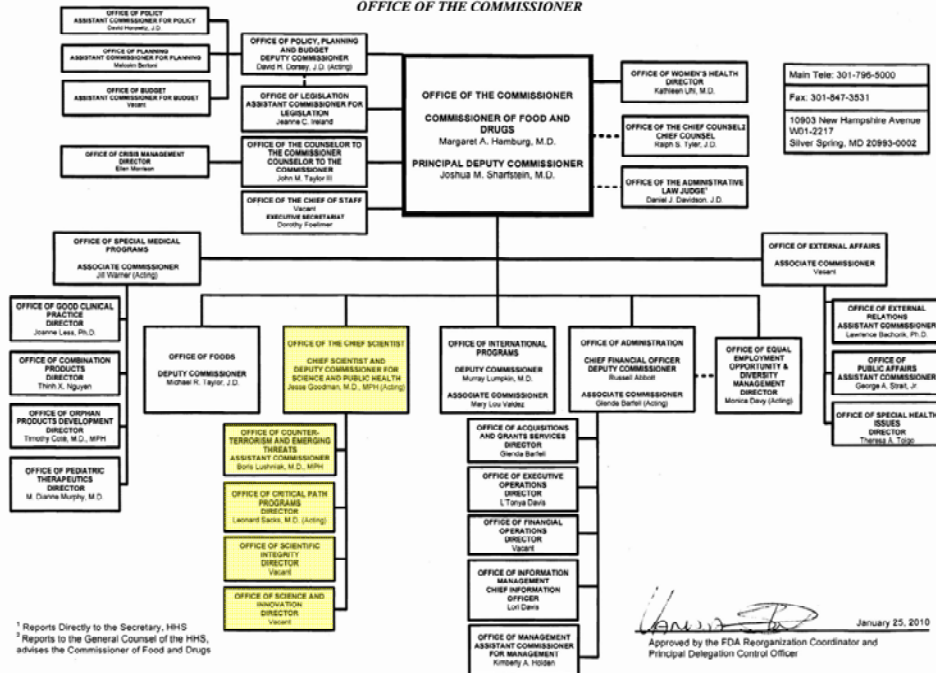
Approved by the FDA Reorganization Coordinator  
and Principal Delegation Control Officer



# The Office of the Commissioner

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## OFFICE OF THE COMMISSIONER



<sup>1</sup> Reports Directly to the Secretary, HHS

<sup>2</sup> Reports to the General Counsel of the HHS, advises the Commissioner of Food and Drugs

# 1. Support: Office of the Chief Scientist

**OFFICE OF THE CHIEF SCIENTIST**

**CHIEF SCIENTIST AND  
DEPUTY COMMISSIONER FOR  
SCIENCE AND PUBLIC HEALTH**  
Jesse Goodman, M.D., MPH (Acting)

**OFFICE OF COUNTER-  
TERRORISM AND EMERGING  
THREATS**  
**ASSISTANT COMMISSIONER**  
Boris Lushniak, M.D., MPH

**OFFICE OF CRITICAL PATH  
PROGRAMS**  
**DIRECTOR**  
Leonard Sacks, M.D. (Acting)

**OFFICE OF SCIENTIFIC  
INTEGRITY**  
**DIRECTOR**  
Vacant

**OFFICE OF SCIENCE AND  
INNOVATION**  
**DIRECTOR**  
Vacant



**“The Office of the Chief Scientist is a fledgling office. So in one sense, the capacity to do tons more and to help lead the pandemic response does impact us. But in another sense, we’re [still] working to define and build what the office does”**

**Jesse Goodman, MD, MPH, Acting CS, in an interview with *The Gray Sheet*, January 2010**

## 2. Recruiting and Retaining Strong Scientists at the Agency

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- **OFFICE OF THE CHIEF SCIENTIST**

- Appointees should be exceptionally accomplished (i.e. have had a medicine approved)
- The Chief Scientist (CS) should write “State of Science” overviews for every disease entity (major categories as well as orphan diseases)
- The Chief Scientist should have the power to convene scientific exchange meetings at any time, on any topic. These meetings should gather attendees from extramural and intramural entities, biomedical intensive funding foundations, companies from the biopharmaceutical industry, and researchers who are doing basic, clinical, and regulatory science
- The staffing model for the Office should assemble teams of scientists who are expert in their respective disease categories / research areas

### 3. Research Information Brokers

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- **Operate under the auspices of the Office of the CS**
- **Are Experts in their field**
- **Foster better coordination and communication between researchers and regulators early and often in the development process**
- **Non-interested/ non-conflicted entities or individuals (i.e. NGO model)**
- **Can coordinate efforts of scientific working groups, which are small in nature and actionable**
- **Increase Transparency and Equipoise**
- **Create value through the transmission of knowledge**

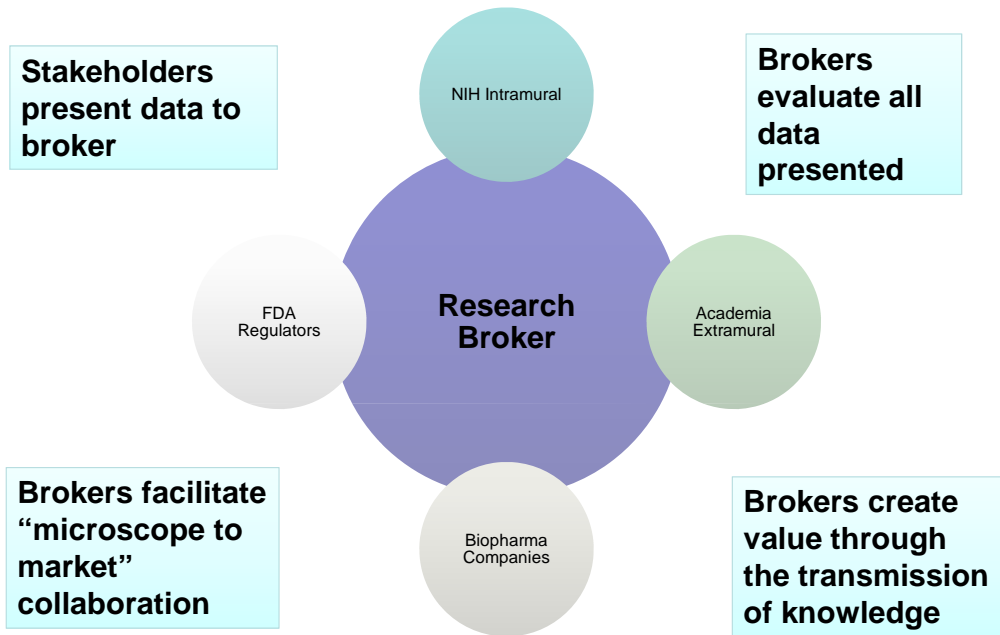
## 4. Private-Public Partnerships

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- **“NGOs” (FDA partners, external review boards, academic centers of excellence, biomedical funding, individuals etc.) would be possible broker**
- **Expert review panels could be assembled from relevant constituencies by brokers to meet the needs of**



# Research Broker Model



# Case Study: HIV/AIDS



## On Using HIV research as the model

“When HIV/AIDS was first recognized in the United States in 1981, the response among members of the affected community was immediate and palpable....more than 30 anti-HIV drugs were developed in less than three decades. There are now more drugs licensed against HIV than all other viral diseases combined. Although these anti-HIV drugs are not a cure, HIV infection is no longer the near-certain death sentence it once was, and patients with access to these drugs can expect to live long and productive lives.”\*

-Dr. Anthony Fauci, Nov. 2009



Anthony S. Fauci, M.D., the current NIAID Director, served as the effective “broker” for the exchange of knowledge HIV/AIDS

\*SOURCE:

[http://www.msnbc.msn.com/id/33890464/ns/health-infectious\\_diseases/](http://www.msnbc.msn.com/id/33890464/ns/health-infectious_diseases/)

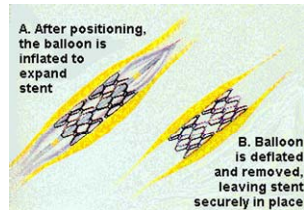
# The Stent Revolution



- Stents are small, mesh-metal tubes used to prop open clogged arteries in the heart once they have been cleared of plaque
- The introduction of the first stent for coronary heart disease was developed by a physician-engineer, Richard A. Schatz, M.D., who ran a knowledge exchange and clinical trials in order to get the Palmaz-Schatz stent into mainstream medicine.
- In 1994, the PALMAZ-SCHATZ® Balloon-Expandable Stent was approved by the U.S. Food and Drug Administration (FDA) for coronary artery applications.
- The stent was recently named one of the “Top 30 Innovations of the Last 30 Years” by PBS’s Nightly Business Report and the Wharton Business School



Julio Palmaz, MD, and Richard A. Schatz, MD were the first Stent Pioneers



The Palmaz-Schatz Stent

**Amicus Curiae [mod.L., lit. ‘friend of the court’].]\***

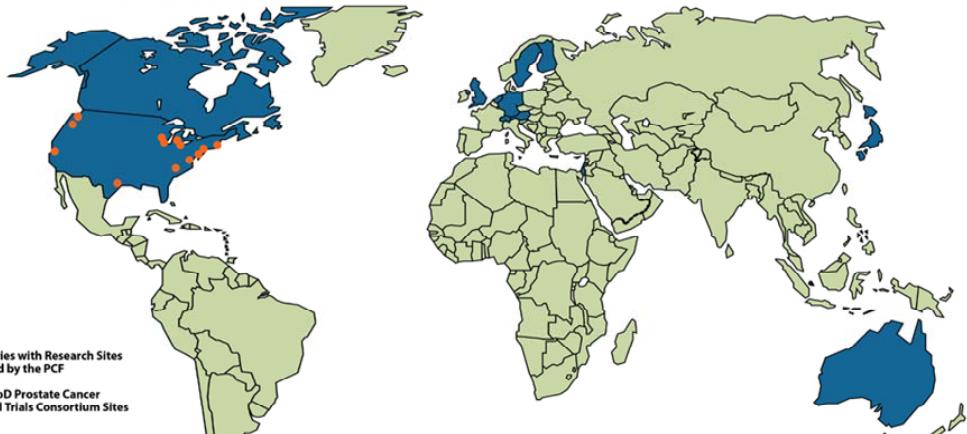
**A disinterested adviser (see quot. 1959).**

1959 **JOWITT** *Dict. Eng. Law* I. 114/1 *Amicus curiae*, a friend of the court, that is to say, a person, whether a member of the Bar not engaged in the case or any other bystander, who calls the attention of the court to some decision, whether reported or unreported, or some point of law which would appear to have been overlooked.

**These FDA partners/NGOs include external review boards, academic centers of excellence, biomedical funding, individuals who are non-conflicted**

# Case Study: Prostate Cancer

## A GLOBAL RESEARCH ENTERPRISE



“We shall not cease from exploration, and at the end of all our exploring will be to arrive where we started and know the place for the first time.”

—T.S. Eliot

## 16 Million Men Battle Prostate Cancer Worldwide

# Efficient and Effective: Etymology

- **Efficient, a. and n.**

- . [a. F. *efficient*, ad. L. *efficient-em*, pr. pple. of *efficre*, f. *ex* out + *facre* to make.]
  - Producing the desired result with the minimum wasted effort; (of a person); competent

- **Effective, a. and n.**

- RELATED TO EFFECT *v.*: the etymological origin of which is “probably partly < classical Latin *effect-*, past participial stem of *efficere* to manufacture, make, to cause to occur, to bring it about that, to be the cause that, to carry out, accomplish, fulfil (< *ex-EX- prefix*<sup>1</sup> + *facere* to do, make: see FACT *n.*), and partly < EFFECT *n.* Compare EFFECTUATE *v.*]”
  - Designating that part or component of an agency or force which is actually brought to bear on a particular object or is instrumental in producing a result; designating a property or quantity considered, measured, or expressed in such a way as to take account of factors which modify its effect or prevent its direct measurement.

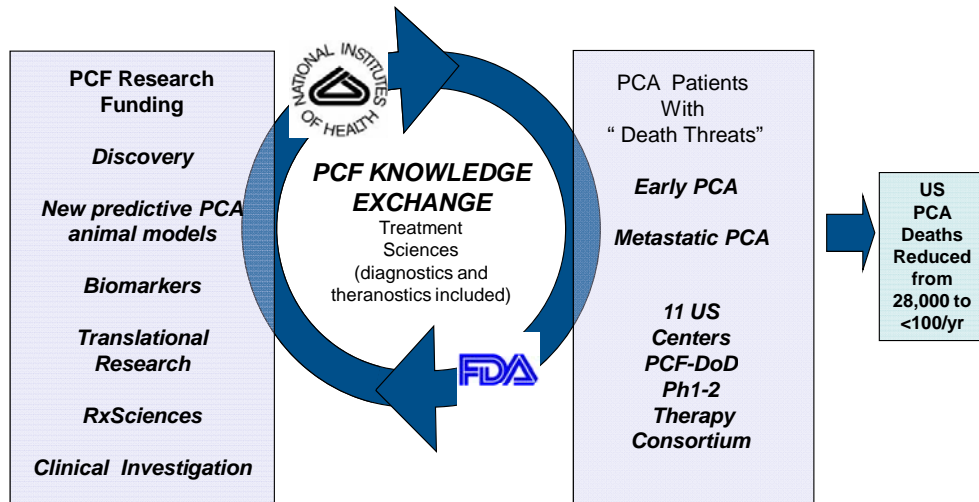
# Efficient and Effective: PCF Metrics

- **Lives saved: Death Rate Reduction**
- **New Clinical Trials**
  - Number of novel ideas and patients involved in clinical trials
- **New Discoveries by Citation Index (Google Scholar)**
- **Number of New Institutions and New Investigators working on the problem**
  - Number of new careers launched
- **Total Number of Advocates**





# Put FDA OCS in the Non Profit- Honest Broker Knowledge Exchange







## For \$25 M Fund and Track Regulatory Science Progress in these Disease Category “Windows”



- Autism
- Autoimmune Disease
- Basic Behavioral and Social Science
- Batten Disease
- Behavioral and Social Science
- Bioengineering
- Biotechnology
- Brain Cancer
- Brain Disorders
- Breast Cancer
- Cancer
- Cardiovascular
- Cerebral Palsy
- Cervical Cancer
- Charcot-Marie-Tooth Disease
- Macular Degeneration
- Malaria
- Malaria Vaccine
- Mental Health
- Mental Retardation (Intellectual and Developmental Disabilities (IDD))
- Mucopolysaccharidoses (MPS)
- Multiple Sclerosis
- Muscular Dystrophy
- Myasthenia Gravis
- Myotonic Dystrophy
- Nanotechnology 8/
- Networking and Information Technology R&D 8/
- Vulvodynia
- West Nile Virus
- Women's Health
- Hepatitis
- HIV/AIDS
- Hodgkin's Disease
- HPV and/or Cervical Cancer Vaccines
- Cost Effectiveness Research
- Crohn's Disease
- Cystic Fibrosis
- Dental/Oral and Craniofacial Disease
- Depression
- Diabetes 2/
- Diagnostic Radiology



BREAST CANCER

**...Stakeholders (companies, academic centers of excellence, intramural researchers) would present data to disease category / research area “brokers” at a virtual transactional “window”**



PROSTATE CANCER

# The PCF Knowledge Exchange

