

# **Building and Maintaining Greatness:** *The Mount Sinai Strategic Plan*

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Dennis S. Charney, M.D.

Dean, Mount Sinai School of Medicine

**Inter-Urban Clinical Club, April 1, 2011**



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*Mount Sinai has a rich history of contributions to  
research & patient-care.....*

Accelerating Science  
Advancing Medicine

Achieving and Maintaining  
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# Mount Sinai's Contributions

## *To National and International Healthcare*

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– BENJAMIN McCREADY, M.D. 1813-1892

*HELPED CREATE THE FIELD OF OCCUPATIONAL MEDICINE*

– ABRAHAM JACOBI, M.D. 1830-1919

*FATHER OF PEDIATRICS IN THE U.S.*

– BERNARD SACHS, M.D. 1858-1944

*FATHER OF PEDIATRIC NEUROLOGY*

– IGNATZ LEO NASCHER, M.D. 1863-1944

*CREATED THE SPECIALTY OF GERIATRICS*

– IRVING J. SELIKOFF, MD 1915-1992

*LED A WORLD WIDE EFFORT TO PREVENT EXPOSURE TO ASBESTOS*

– KURT DEUSCHLE, M.D. 1923-2003

*FATHER OF COMMUNITY MEDICINE*

# Mount Sinai's Discoveries

## *with Worldwide Implications*

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- 1908- Ottenberg performs group matched transfusion
- 1910- Elsberg introduces endotracheal anesthesia
- 1915- Lewisohn describes blood preservation solution
- 1919- Rubin develops first test for tubal patency
- 1928- Shwartzman describes the “Shwartzman phenomenon”
- 1929- Swick introduces radio-opaque dye
- 1929- Master develops the stress test
- 1959- Ornstein and Davis develop gel-electrophoresis
- 1959- Berson and Yalow develop radio-immunoassay
- 1969- Kilbourne develops first genetically engineered vaccine
- 1977- Palese maps first influenza virus genome
- 1988- First demonstration of how asbestos causes cancerous changes in cellular DNA
- 1991- Ramirez identifies gene for Marfan Syndrome
- 1992- Davis et al develop first drugs approved for treatment of Alzheimers
- 2001- Desnick et al formulate enzyme replacement therapy for Fabry's disease
- 2003- Sampson et al develop treatment for peanut allergy that raises threshold before allergic response



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# *The Challenge: 2004*

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Sinai emerging from unsuccessful merger with NYU

Medical School Ranking (US News & World Report) = 32

NIH Funding Rank = 25

## Challenges:

### 1. Funding

- NIH Budget flat =only strongest proposals funded in zero growth environment

### 2. Research

- Complexity has increased and is more resource intensive
- Major breakthroughs require significant investment
- NIH cutbacks have increased pressure for results-oriented research

### 3. Space

- No new construction since 1997
- MSSM expected to have the lowest space devoted to research by 2006
- High correlation between NIH ranking and research space
- Lack of space impacting ability to:
  - grow
  - offer new programs
  - recruit

# MSSM was at a critical junction in its history

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- Institution vulnerable to competitive peer pressure and faculty retention challenges
- Inadequate research will impact NIH and Medical School ranking making institution unattractive to outstanding students
- Lack of a strong clinical research will impact ability to attract exceptional clinicians

# 2005 – Start of Strategic Planning Process

*“Going From Very Good to Great”*

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Charge to 22 Work Groups with >100 Faculty

*How can we  
leverage & nurture Mount Sinai's  
culture and history  
of  
interlocking relationships  
between  
clinicians and researchers  
to enable  
new discoveries & cures?*

## 3 Recurring Themes for Research Focus:

1. Basic Science leading to Therapeutic Discoveries in targeted diseases
2. Clinical Research across the life span leveraging Sinai's patient population and hospital
3. Emphasis on Basic and Clinical research opportunities that can be facilitated by industry partnerships



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*Despite its moderate size and lack of a strong university affiliation, MSSM is capable of leading the nation in biomedical research resulting in therapeutic breakthroughs.*



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# *The Vision*

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# MSSM Biomedical Research

*Going from Very Good to Great*

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## The Basic Principles



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# MSSM Biomedical Research

## *Going from Very Good to Great*

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- Identify and recruit research leaders who share this vision and goals
- Leaders characterized by great personal drive and will to effect change who can:
  - Identify opportunities and target “doable” but important problems
  - Recruit exceptional quality scientists across diverse fields
  - Facilitate breakthrough research in a nurturing environment
  - Facilitate funding and intellectual property

*Hollingsworth 2000, 2008*

*Collins 2001*

# MSSM Biomedical Research

## *Going from Very Good to Great*

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- Build research teams for 21<sup>st</sup> century science
- Research teams characterized by:
  - Moderate size
  - Multidisciplinary approach
  - Intense and frequent interaction with peers
  - Rockefeller University as a model
    - A “translational Rockefeller”

*Hollingsworth 2000, 2008*

*Collins 2001*

# 2005 Goals



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- NIH Funding Rank in Top 20
- Medical School Rank in Top 20

Target  
Ranking

NIH = 1-7							NIH - 8-15								
Hopkins	Wash U	U Penn	UCSF	Duke	U-Wash	UCLA	Yale	U-Pitt	Baylor	U-Mich	Stanford	Columbia	UCSD		
1	2	3	4	5	6	7	8	9	10	11	12	14	15		
2	3	4	5	6	7	11	11	16	13	9	8	10	14		
<b>Med School = 2-11</b>							<b>Med School = 8-16</b>								
NIH - 16-23							NIH - 24-31								
U-AL	Vanderbilt	CWRU	UNC	UTSW	U-Col	Emory	MSSM	Chicag	Einste	Iowa	U-Wis	U-Roc	U-Min		
16	17	18	20	21	22	23	24	25	26	28	29	30	31		
23	17	20	23	17	30	20	32	19	38	28	26	30	38		
<b>Med School = 17-30</b>							<b>Med School = 19-38</b>								

2005  
Ranking



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# *Achieving and Maintaining Greatness*

## *Basic Principles*

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# Role Model

## *Research*

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## Rockefeller University

- Founded 1901
- First US Institution devoted solely to biomedical research
- 23 Nobel Prize winners associated with the University
- 20 Lasker Award winners
- 13 National Medal of Science winners
- 35 Members of the National Academy of Sciences
- 14 Members of the Institute of Medicine

# Role Model

## *Research*

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## Rockefeller University

- 69 Laboratories
- 6 Research Areas (biochemistry, structural biology, chemistry; immunology, virology and microbiology; molecular, cell and developmental biology; medical sciences and human genetics; neuroscience; physics and mathematical biology)
- 9 Interdisciplinary Centers (cancer; hepatitis C; physics and biology; immunology and immune diseases; Alzheimer's disease; sensory neuroscience; biochemistry and structural biology; mind, brain and behavior; human genetics)

## MSSM Goal:

- Establish world-class interdepartmental, multi-disciplinary research teams
- Provide research environment for breakthrough discovery to improve diagnosis and treatment of human diseases

# Characteristics of Scientifically Weak *Academic Medical Centers*

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1. Increased differentiation (silos) and less integration and collaboration
2. More Bureaucracy
3. When research organizations respond to growth by differentiating into new departments and by imposing hierarchical and bureaucratic controls → limiting the process of crossing academic disciplines and a decline in integration and diminished possibility of major discoveries
4. Most medical schools lack flexibility and there is a sharp differentiation between clinical sciences and basic sciences
5. Has resulted in relatively few major discoveries in the 20th century

*Hollingsworth, 2000, 2008*

# Institutional Factors

## *Facilitating Scientific Creativity & Major Discoveries-1*

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1. Nimble administrative structure
2. Rigorous scientific focus
3. Financial discipline regarding scientific investment
4. Facilitate scientific entrepreneurship

*Hollingsworth 2000, 2008*

# Institutional Factors

## *Facilitating Scientific Creativity & Major Discoveries-2*

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1. Recruit great scientists who value scientific diversity
2. An environment that facilitates communication and social integration of scientists from different fields through *frequent* and *intense* interaction
3. Leaders who integrate scientific diversity, have the capacity to understand the direction in which scientific research is moving, and provide rigorous criticism in a nurturing environment

*Hollingsworth 2000, 2008*



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# *Achieving and Maintaining Greatness* *The Strategic Plan*

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# The Ingredients needed for: *Achieving and Maintaining Greatness*

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1. Great Administrative Leadership (Dean, CEO)
2. Great Leaders of People (Chairs, Institute Directors)
3. Great Players (Scientists, Physicians)

**All 3 are NEEDED.**

# Value the Tripartite Missions of MSSM

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1. Research
2. Education
3. Clinical

**Alignment of Research, Education & Clinical missions  
is critical to the successful implementation of the  
Strategic Plan**

# Creation of Research Institutes



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## Institute model reflects Hollingsworth's findings to leverage:

*“high cognitive complexity” that allows successful scientists to see important relationships among disparate fields of knowledge*

- Institutes designed to facilitate breakthrough science
  - 7 Disease-Oriented
  - 6 Cores to complement work of Disease-Oriented Institutes
- Carefully selected in areas of research where Sinai excels
- Organization flexibility to quickly respond to scientific advances
- Recruited world-class scientists
- Provided the intellectual freedom and space to pursue their best ideas

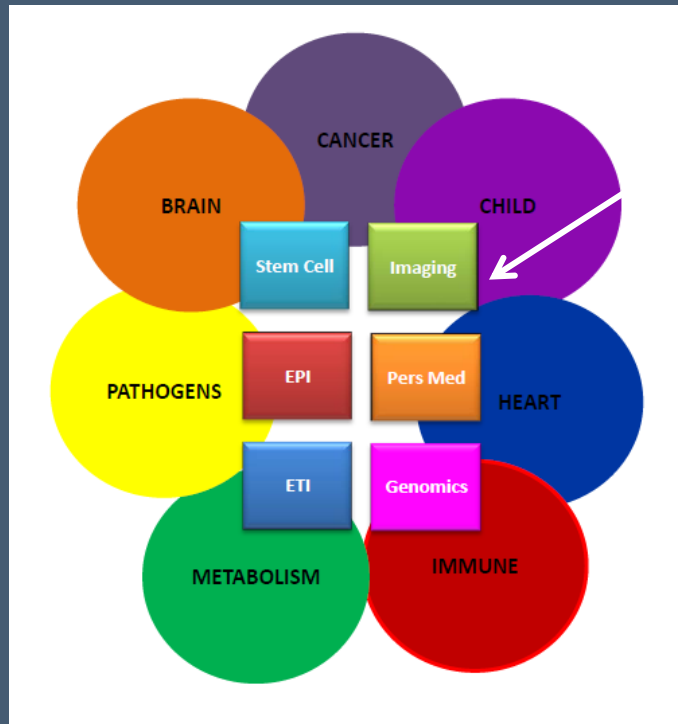
# MSSM Research Institutes



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*7 Disease-Oriented Institutes & 6 Basic Institutes of Excellence*

- Delivering superior care and performing exceptional research
- Conducting multi-disciplinary **translational research** leading to therapeutic discoveries



**6-Basic Institutes Nucleus**

**Fierce  
Competition**

**Fierce  
Cooperation**

*We intend to create a research environment that encourages collaboration and rewards work that challenges conventional wisdom*

*Dennis S. Charney, MD*

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# Major Recruitments



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Chair	Health Evidence & Policy	Eric Rose, MD
Chair	Medicine	Mark Babyatsky, MD
Chair	Neurology	Stuart Sealfon, MD
Chair/Director	Neuroscience/Brain Institute	Eric Nestler, MD
Chair	Pathology	Carlos Cardon-Cardo, MD
Chair	Pediatrics	Lisa Satlin, MD
Chair	Psychiatry	Wayne Goodman, MD
Chair	Radiation Oncology	Kenneth Rosenzweig, MD
Director	Cancer Institute	Steven Burakoff, MD
Director	Disease Prevention & Public Health Instt	Paolo Boffetta, MD MPH
Director	Stem Cell Institute	Ihor Lemischka, PhD
Director	Transplant Institute	Sander Florman, MD
Chief	Division of HemOnc/DOM	William Oh, MD
Chief	Division of GI/DOM	Bruce E. Sands, MD MS
Chief	Breast Surgery	Elisa R. Port, MD FACS
Chief	Thoracic Surgery	Raja Flores, MD
Director	Mood & Anxiety Program	Dan Iosifescu, MD
Director	Multiple Myeloma Program	Sundar Jagannath, MD
Director	Head & Neck Onc Program	Marshall R. Posner, MD
Medical Director	Ruttenberg Cancer Center	Randall Holcombe, MD
Chief Medical Officer	FPA & Mount Sinai Hospital	Mark Callahan, MD

***Over 350 faculty recruited at all levels***

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# Research 2010 Results



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- MSSM #18 in NIH Funding with >\$275M in grants
- AARA Funding Outstanding with over \$50M awarded in 2010.
- Efficiency of space utilization is high –  
Compared to peer AMC's:
  - #2 in Grant \$ per P.I.
  - #3 in Direct Grant \$/P.I.
- This increase has enabled us to make major recruitments within our existing space



Center for Science & Medicine  
Completion 2012

Teaching tomorrow's doctors and scientists that:

**Science, Service and Advocacy** are inextricably related

&

Our scientific goal is to bridge the gap between Bench-Bedside-Community

Curriculum Reforms in both Medical & Graduate School to seamlessly integrate:

– Clinical relevance into scientific research

&

– Scientific principles into clinical training

To produce leaders in bio-medicine & healthcare

**Committed to clinically relevant breakthrough science**

# Education Goals



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- **Recruitment of outstanding medical and graduate students**
- **Obtain Independent Degree Granting Status**
- **Develop unique cutting edge curriculum in medical and graduate school**
- **Mentorship**



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## Goals of the new Institute:

- *Recognition/Reward* for Excellence in Education
- Support for *Promotion* on Educator Track
- Support and development in *Teaching/Education*
- Support and development of *Scholarship*
- Create an *Educational* community

## MD Students

• Number of Complete Applications:	4,751
• Number of Interviews (excl EA/MSTP)	784
• Size of Class	141
• MSTP	11
• Humanities and Medicine	28
• NYS State Residents	32%
• Women	47.8%
• URM	19.7%
• Average MCAT	35.4
• Average GPA	3.71
• Number of Undergraduate Schools	59

(Brown=12, Harvard=10, Columbia=9, Cornell=9, Duke=6, Princeton=6)

# Education: Quality – Matriculating Class of 2010

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## PhD Students

- Number of Complete Applications: 436
- Size of Class 39
- NYS State Residents 28%
- Women 46%
- URM 8%
- Average GRE 1,290
- Median GPA 3.53
- Number of Undergraduate Schools 32  
(Columbia 2, Emory 2, Boston College 1, Dartmouth 1, Hopkins 1, NYU 1, Tufts 1, Wash U 1)

# Education: Quality – Matriculating Class of 2010

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## MD/PhD Students

- Number of complete applications: 256
- Size of class: 11
- NYS State Residents: 54.5%
- Women: 27%
- URM: 0
- Average MCAT 37
- Median GPA 3.84
- Number of UG Schools: 11

(Brown U: 1, Bowdoin College: 1, Pomona College: 1, Johns Hopkins: 1, Harvard: 1)



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# *Reinvigorating the Clinical Mission*

## *The Strategic Plan*

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## Mayo Clinic

- The first and largest integrated not for profit medical group practice in the world
- “Mayo Clinic is a collaborative organization, a pliable institution that assembles the expertise needed for individual patients. Once the teams provide the necessary care, they disband and reconfigure to meet the medical needs of other patients. Imagine a huge store that sells everything, with experts in every department who work together to help customers. This is how Mayo Clinic is designed for medical customers. **Patients don't get just a doctor; they get, in effect, the ‘whole company.’** The Mayo system of integrated, multi-specialty, outpatient and inpatient medical care doesn't always work as intended. But it does work most of the time and represents Mayo Clinic's most important competitive advantage.”

## Mayo Clinic Model of Care

- **Principles of Outstanding Patient care**
  - Collegial, cooperative, staff teamwork with multispecialty integration. A team of specialists is available and appropriately used.
  - Highest quality patient care provided with compassion and trust.
  - Comprehensive evaluation with timely, efficient assessment and treatment.
  - Availability of the most advanced, innovative diagnostic and therapeutic technology and techniques.

# Role Model

## *Clinical Care*

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- Mayo Clinic's brand is world-class because it reassures; it evokes confidence in customers who truly need to trust. In the end, great services brands are built on excellent customer experiences, and this is the meta branding lesson the Mayo Clinic teaches.
- **Our goal is to establish Mount Sinai as a world class brand of outstanding patient centered clinical care**
- **When the patient comes to Mount Sinai, they get the entire institution**

# Clinical-Goals

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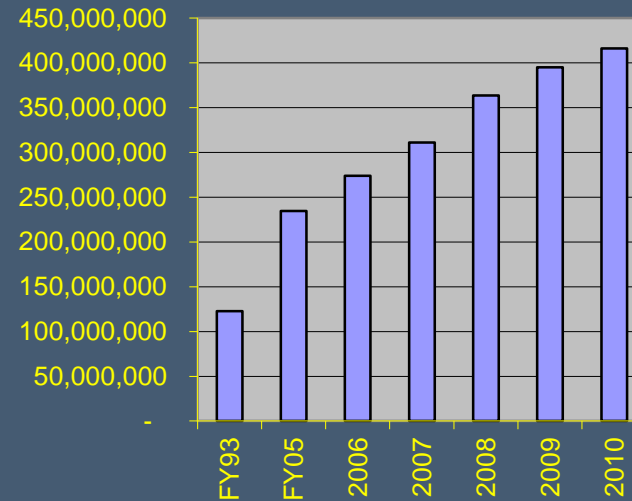
- Develop a patient-centered, efficiently-run, professionally-managed FPA without losing any of the existing entrepreneurial spirit
- Develop a culture of service, so that our patient satisfaction matches our outstanding quality of patient care
- Improve operational efficiency, such as in the revenue cycle, realizing economies of scale where appropriate
- Continue our practice growth
- Expand primary care on campus and develop strategic alliances to expand our primary care reach

# Clinical Results



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School	Receipts	Clinical MDs	Receipts/ MD
Northwestern U Feinberg SOM	426,896,137	670	637,158
Cornell U Weill Med Coll	412,018,192	702	586,921
Washington U in St Louis SOM	560,665,653	1,112	504,196
<b>Mount Sinai School of Medicine</b>	<b>394,983,757</b>	<b>863</b>	<b>457,687</b>
Wake Forest University SOM	274,770,681	638	430,675
U Wisconsin Medical School	472,683,202	1,144	413,185
U Rochester SOM & Dentistry	303,314,024	746	406,587
Emory University Sch of Med	467,485,488	1,168	400,244
Columbia U Coll of P & S	467,594,615	1,248	374,675
Duke University Sch of Med	383,038,352	1,071	357,646
Ohio St U Coll of Med-Pub Hlth	200,907,316	633	317,389
Indiana University Sch of Med	377,268,053	1,192	316,500
Johns Hopkins University SOM	375,699,502	1,208	311,010
Yale University Sch of Med	293,827,070	972	302,291
UC Los Angeles Geffen SOM	372,202,804	1,307	284,776
University of Virginia SOM	209,803,348	760	276,057
Univ Iowa Carver Coll of Med	181,539,940	686	264,635
Beth Israel-Deaconess Med Ctr	243,579,961	923	263,900
University of Florida COM	179,287,531	742	241,627
University of Maryland SOM	176,398,700	777	227,025
Oregon Health & Science U	196,950,585	893	220,549
Massachusetts General Hospital	490,116,067	2,271	215,815
University of Cincinnati COM	138,223,060	650	212,651
UC San Diego Sch of Med	134,875,529	843	159,995
University of Washington SOM	190,317,754	1,332	142,881



FPA Patient Care Receipts compared to other Top Ranked Schools

2009 - #5

2010 - #4

FPA receipts growth has averaged 12.2% annually over the past 5 years and exceeded \$416.1 million in 2011 resulting from new recruits, physician productivity and billing/collection improvement initiatives.

# Results

## *Quality Improvements on all 3 missions*

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### **Best Doctors in NY**

- 147 FPA Doctors in 49 specialties  
Total 394 in 56 specialties (includes voluntaries, affiliates and non-FPA)

### **US News & World Report Rankings**

- Medical School 2010 #18 (was #32 in 2004)  
Hospital 2010 - “One of the Best Hospitals in US”  
Top 20 in 7 Specialties (up from 6 in 2009)  
Top 50 in 13 Specialties (up from 11 in 2009)  
(out of 4,852 hospitals analyzed)

### **NIH Funding Rank**

- Highest level in Sinai’s history at >\$250M

### **AAMC Rank (unchanged from 2009)**

- U.S. Medical Schools (AAMC) 2010 #3 Research Dollars/Principal Investigator  
#2 Research Density

**“A” on AMSA Pharmafree Scorecard on COI policies (1 of only 12 in country)**



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# *Scientific Innovation in an Age of Uncertainty*

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# FDA approved drugs

## *based on Publicly-funded research*



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High correlation between disease priorities and NIH Institutes' budgets

However, these priorities are not the same as those of Pharma. Research supported by NIH and other public entities has had a more immediate effect in improving public health than other funding mechanisms.

**Table 1. Number of Drug Products Approved by the Food and Drug Administration and Originating from Public-Sector Research, According to Therapeutic Area, 1970–2009.**

Therapeutic Area	Number
Total	153
Hematology or oncology	40
Infectious disease	36
Cardiology	12
Metabolic disease	12
Central nervous system	12
Dermatology	7
Renal disease	7
Ophthalmology	6
Immunology	6
Gastroenterology	4
Women's health	3
Allergy	2
Pulmonary disease	2
Urology	2
Anesthesiology	1
Dental disorders	1

•In the past 40 years, 153 FDA approved drugs were discovered by institutions

•FDA approved 1,541 new drug applications

•46.2% of publicly funded new drug applications received priority review vs 20% for private-sector

•Publicly funded research has contributed 9.3%-21.2% of all new drugs involved in new drug applications

*Source:*

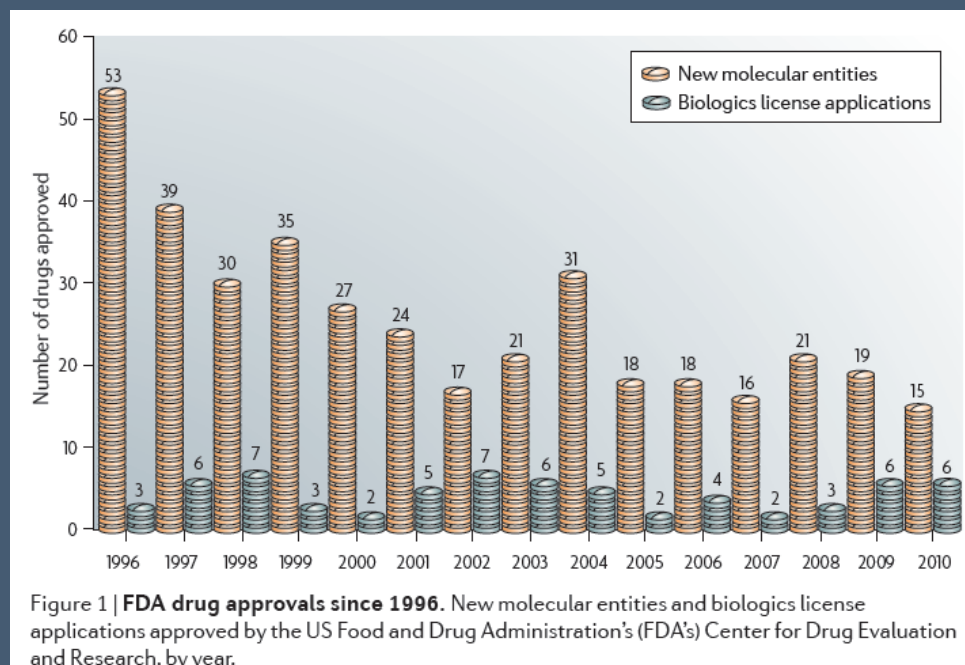
*NEJM, Feb 10, 2011*

# Shifting Landscape-1

## Trend in Drug Discovery & FDA Approvals



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Shift from primary care to specialty care continues

Payer dissatisfaction with high prices for incremental innovations for same diseases

Need to be accountable to payers is shaping discovery & development programs at drug firms

Preference to tackle expensive treatments for chronic conditions

Source: Nature 2011

# Shifting Landscape-2

Drug Companies reducing R&D and “out-sourcing” basic research



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## Susan Desmond-Hellmann

In 2009, Susan Desmond-Hellmann left Genentech, after 5 years as President of Product Development, to become Chancellor at the University of California, San Francisco (UCSF). **Since rejoining academia, she has overseen the creation of numerous UCSF–industry alliances,** including recent deals with Pfizer, Sanofi–Aventis and Bayer. Similar partnerships, of varying forms, are appearing around the world, as pharmaceutical and biotechnology companies seek new sources of innovation to shore up faltering pipelines. Speaking with **Asher Mullard**, Desmond-Hellmann discusses the increasing interest in industry–academia collaborations and looks back on the lessons she has learned since leaving Genentech. *Nature, March 2011*

### PHARMACEUTICALS

## Pfizer’s Shakeup Means Less Money for Research

The pharmaceutical giant Pfizer has announced **it will lay off thousands** of workers and **cut its research and development budget by between \$1.5 billion and \$2 billion in 2012.** That drastic decrease, industry observers say, reflects uncertainties facing many large drug companies about what role they should play—or even want to play—in basic drug research. **Increasingly, they shop for the science they need, when they need it.**

1100 jobs at its Groton, Connecticut, office and transfer 450 jobs from there to an office in Cambridge, Massachusetts.

Pfizer is not alone in emphasizing areas such as neuroscience, where scientists have made progress recently in understanding disease mechanisms, and deemphasizing broad categories such as internal medicine, says Jeffrey Elton, a former executive at Novartis and now CEO of Kew Group, a personalized

*Science, February 11, 2011*

Basic Science research is expensive but that is where academia excels

Drug Companies reducing their R&D budgets and Basic Science research

Pharma leveraging the high quality of science and depth of knowledge at academia to increase their understanding of drug interactions

Collaborations between academia and Pharma on the rise

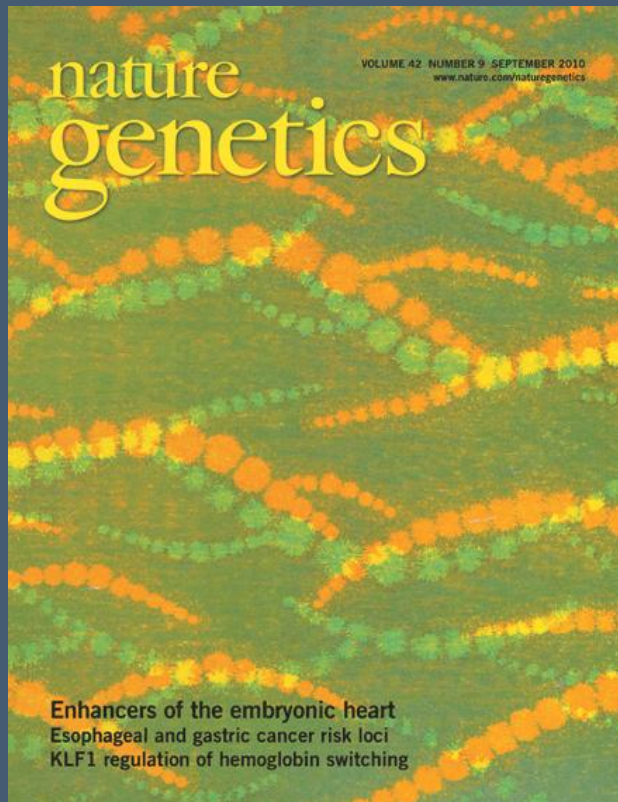
Goal is to improve the predictability of outcomes of new drugs .

# Mount Sinai's response-1

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## Creation of Genomics Institute

*To provide the latest Genetic/Genomic Technologies and Computational and Analytical Capabilities for MSSM Investigators*

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# Mount Sinai's response-2



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## Creation of Center for Discovery & Innovation

*To illuminate new disease targets and  
the molecules that treat those targets.*

*This discovery group will identify the  
most promising research within all of  
Mount Sinai's disease-focused  
institutes.*