NCI and the Common Fund

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Director, Division of Program Coordination, Planning, and Strategic Initiatives
June 23, 2014

Changes Brought by the Reform Act

One Hundred Ninth Congress
of the
United States of America

AT THE SECOND SESSION

Begun and held at the City of Washington on Tuesday, the third day of January, two thousand and six

An Act

To amend title IV of the Public Health Service Act to revise and extend the authorities of the National Institutes of Health, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "National Institutes of Health Reform Act of 2006".

TITLE I—NIH REFORM

2004: NIH Roadmap is launched

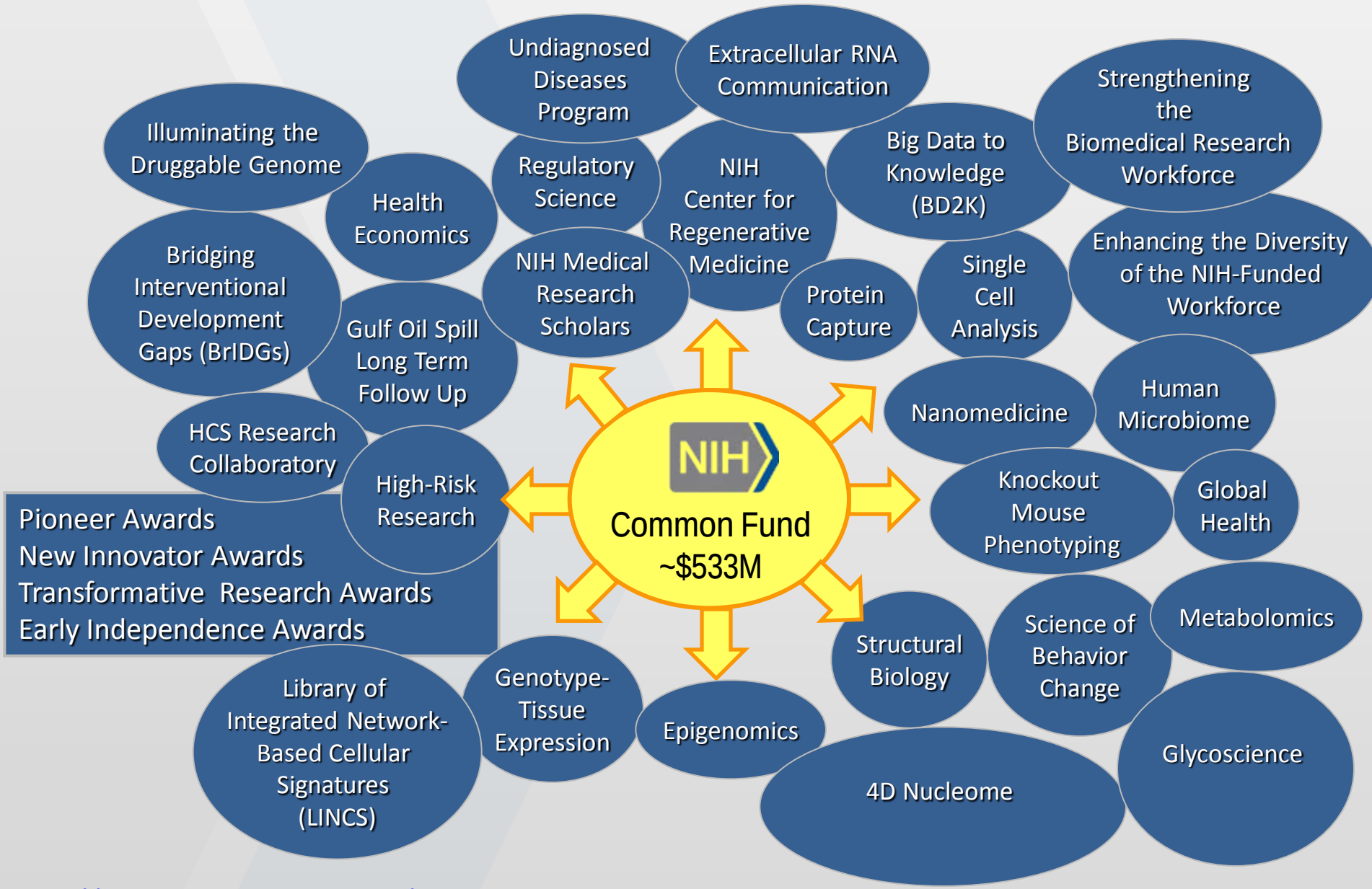
December 9, 2006: Congress unanimously passes a reauthorization bill affirming importance of NIH and its vital role in advancing biomedical research to improve the health of the Nation

Establishes the Division of Program Coordination, Planning, and Strategic Initiatives (DPCPSI) within the Office of the Director and the NIH Common Fund to provide a dedicated source of funding to enable *trans*-NIH research

Criteria for Common Fund Programs

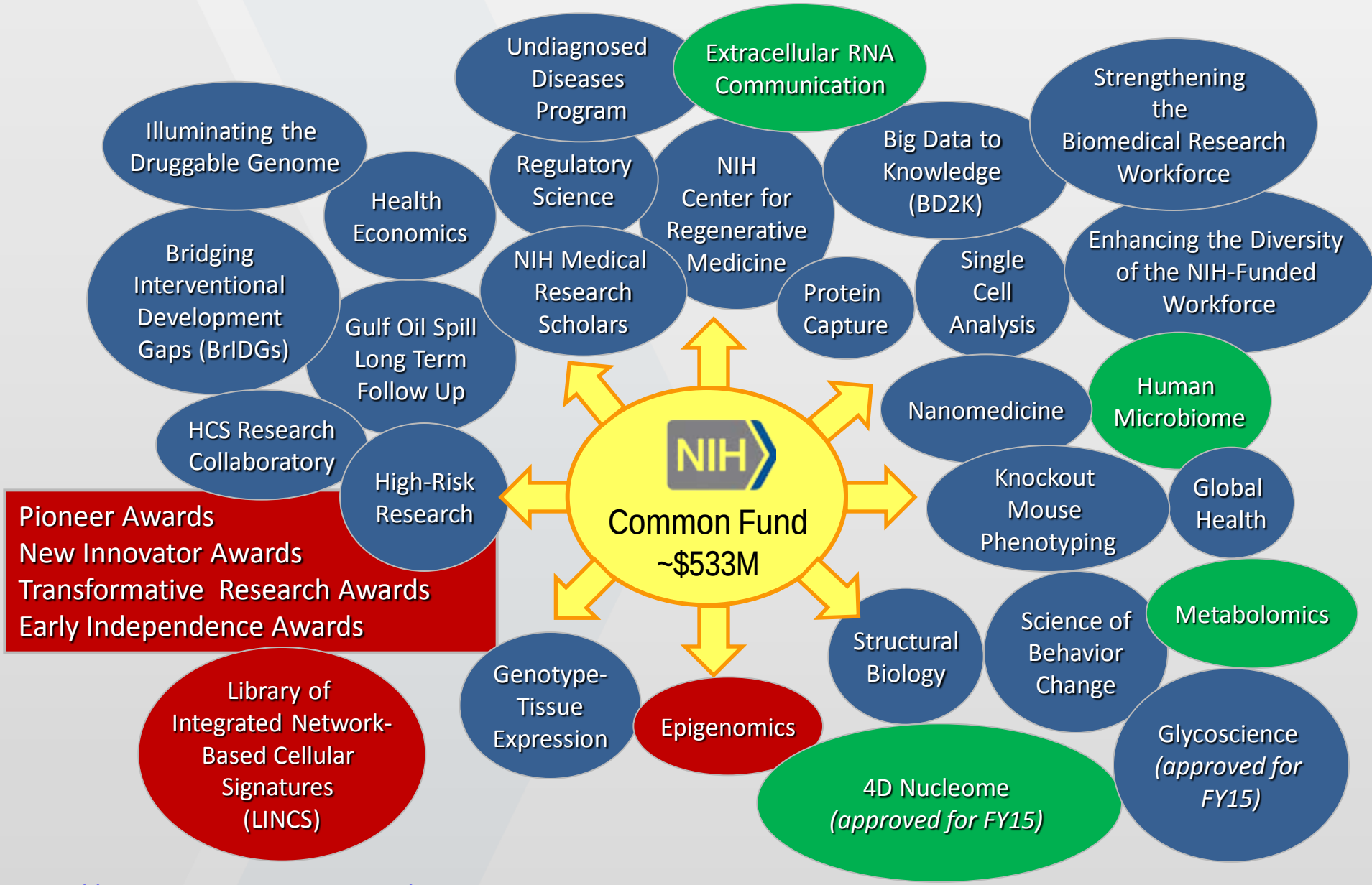
- **Transformative:** Must have high potential to dramatically affect biomedical and/or behavioral research over the next decade
- **Catalytic**: Must achieve a defined set of high impact goals within 5-10 years
- **Synergistic:** Outcomes must synergistically promote and advance individual missions of NIH Institutes and Centers to benefit health
- **Cross-cutting:** Program areas must cut across missions of multiple NIH Institutes and Centers, be relevant to multiple diseases or conditions, and be sufficiently complex to require a coordinated, trans-NIH approach
- **Unique:** Must be something no other entity is likely or able to do

Current Common Fund Programs (FY14)



http://commonfund.nih.gov/

Current Common Fund Programs (FY14)

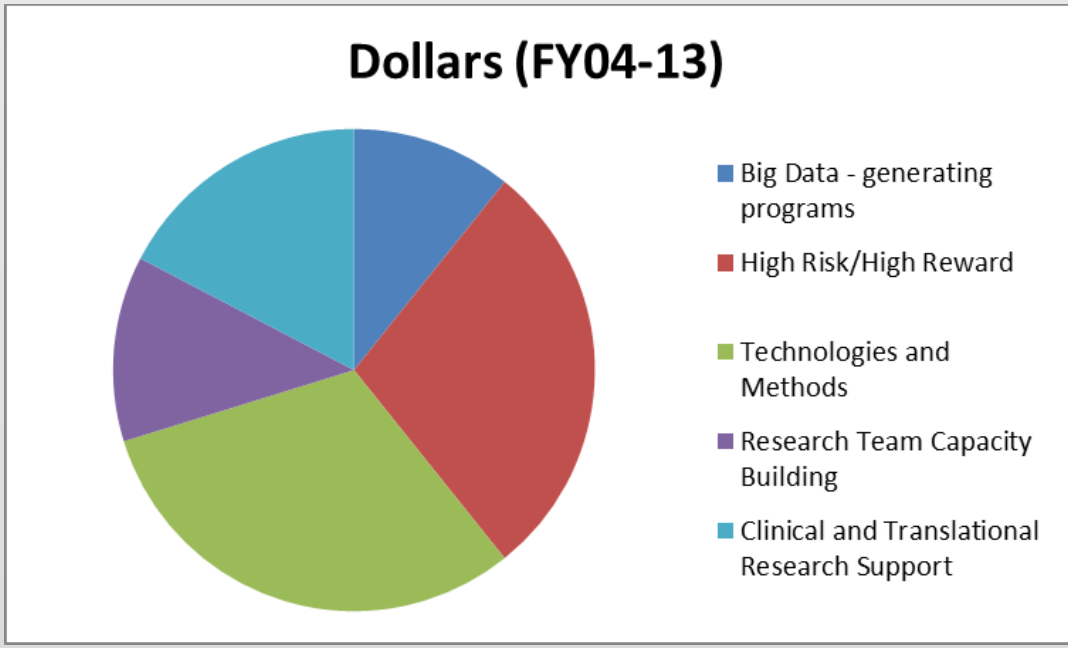


http://commonfund.nih.gov/

The CF represents a significant investment and a new way of managing science:

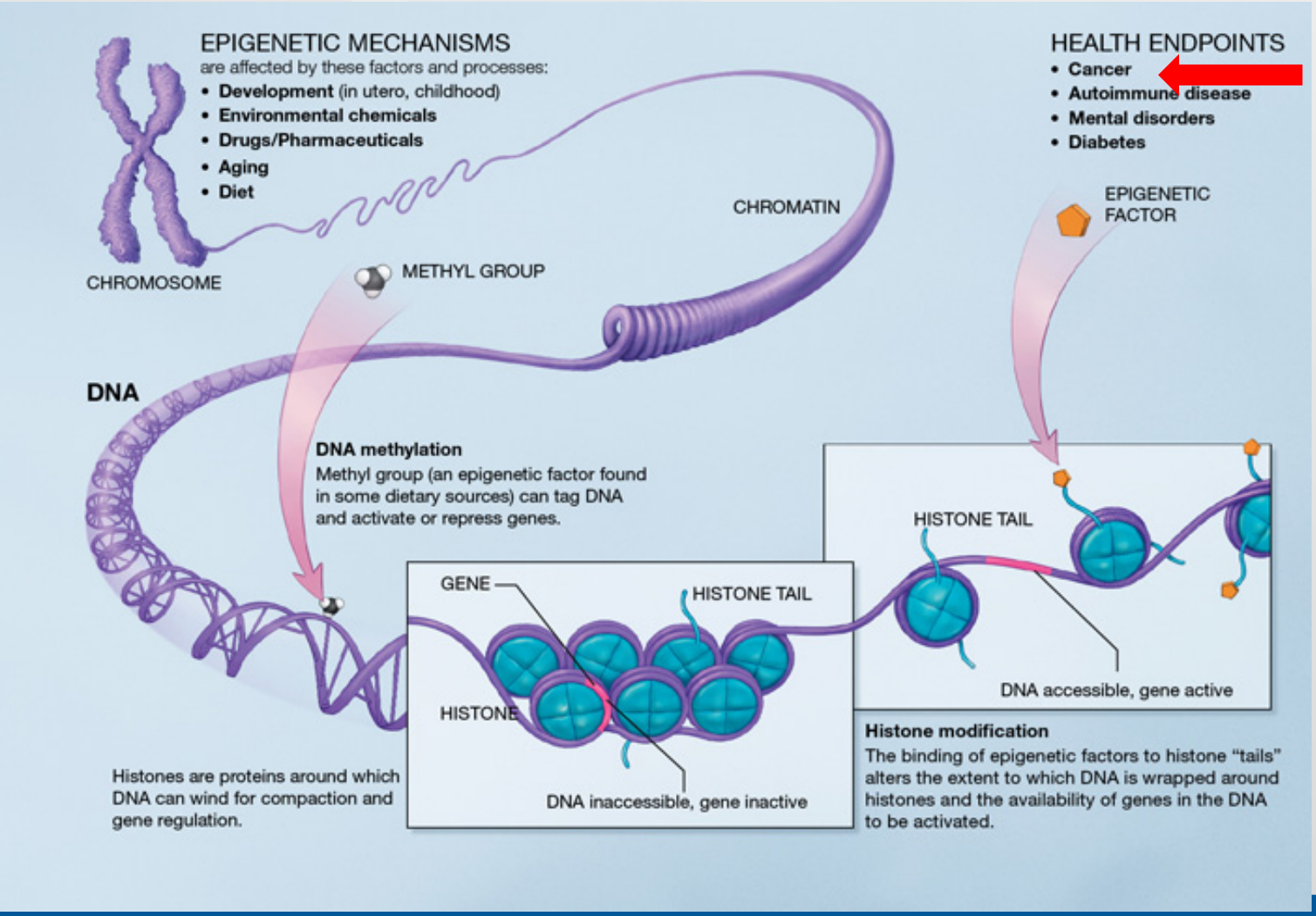
- Over $4 Billion expended since inception
  - ❖ FY 2014 budget of $533,039,000
  - ❖ Similar to mid-sized IC budgets

- ❖ All CF programs are managed by multi-IC teams.
- ❖ OSC staff are part of each team and provide a bidirectional link between each team and OD Leadership.
- ❖ NCI led programs include exRNA Communication, Metabolomics, and 4D Nucleome



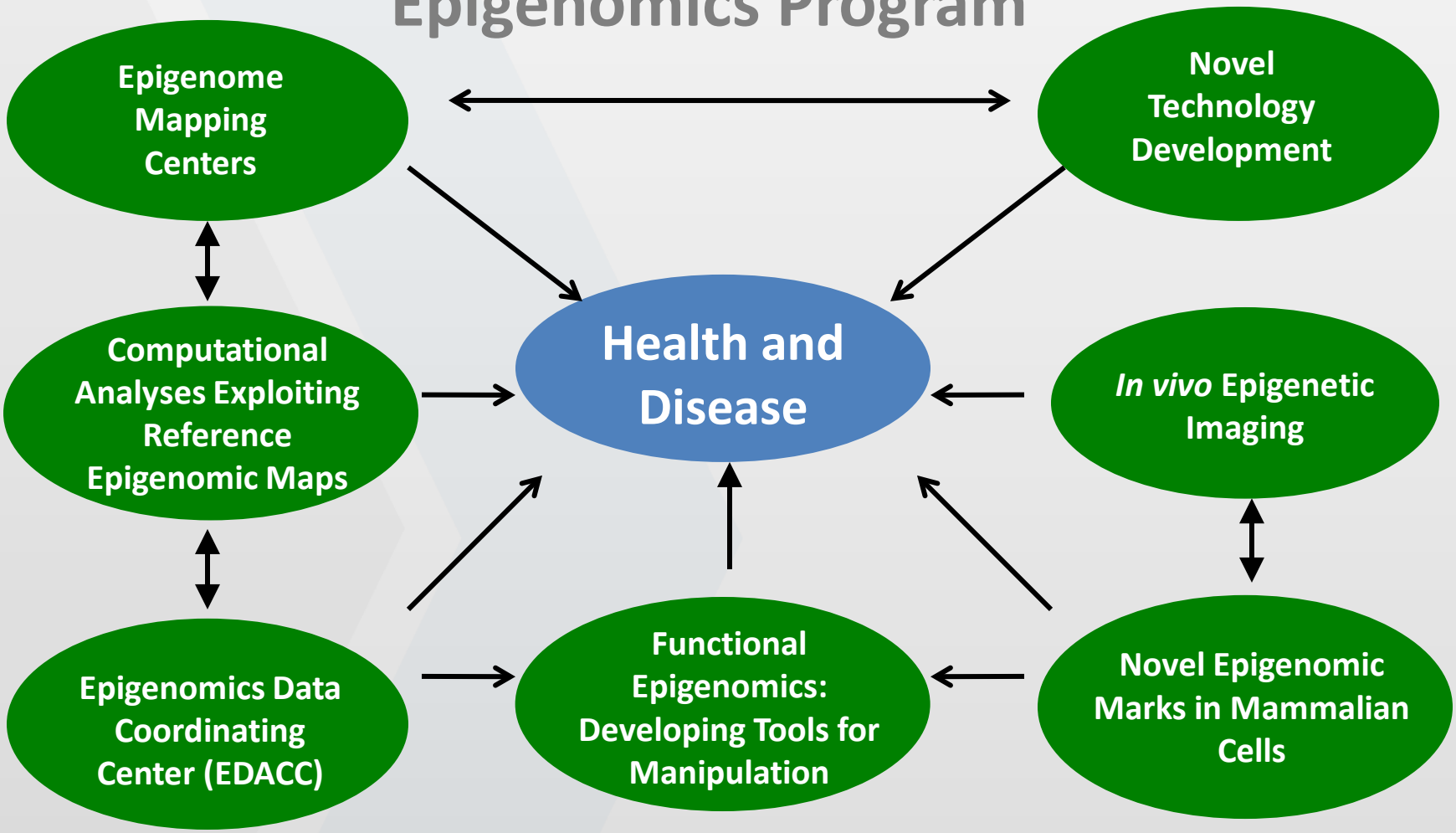
Epigenomics

Epigenomics is the study of chemical modifications that occur "on top of" the genome. These modifications do not change the underlying DNA sequence, but can regulate when and where genes are expressed.



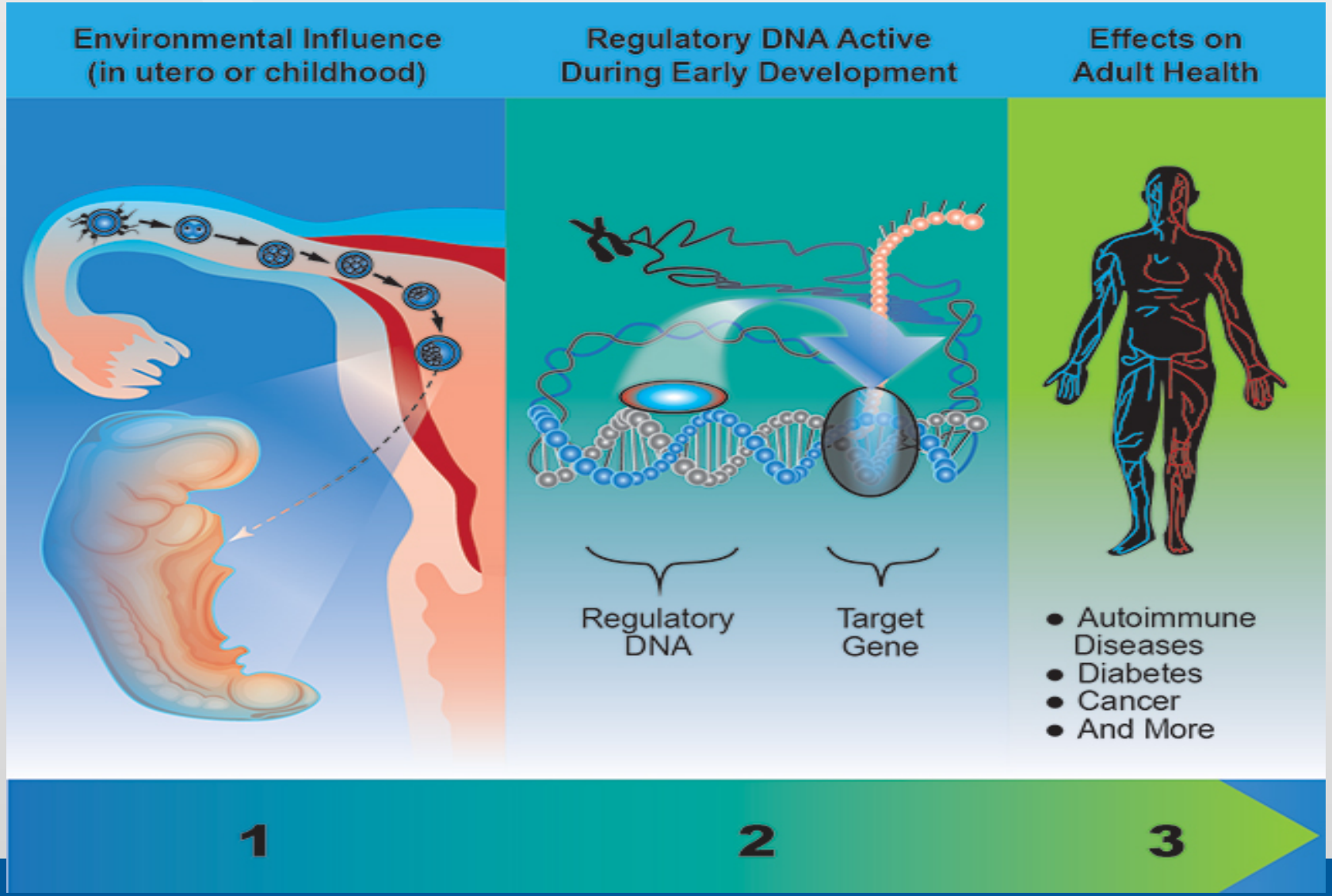
Alterations in the epigenome are linked to many different kinds of diseases, including cancer.

Epigenomics Program



- Tools, technologies, and data sets generated by this program will enable cancer researchers exploring how the epigenome influences cancer risk and disease progression
- Several Epigenomics grants have focused on cancer (metastatic breast cancer, Barrett's neoplastic progression, tumor stem cells

Epigenomics Research Leads to Link Between Early Environmental Exposures and Risk of Adult-Onset Diseases, Including Cancer



PROMIS

- The Patient-Reported Outcomes Measurement Information System (PROMIS) aims to provide clinicians and researchers access to **efficient, precise, valid, and responsive** adult- and child-reported measures of health.

- PROMIS creates a **state-of-the-art assessment system** for self-reported health.

- Many PROMIS outcomes are directly related to the mission of NCI.

- PROMIS delivers a quantifiable and reproducible method to assess how patients are feeling, including people with chronic or long-term diseases, such as patients undergoing lengthy cancer treatment. PROMIS has also been applied to pediatric cancer patients.

Person Centered Outcomes Research Resource (PCORR) RFA

Central issue: lack standardized patient-centered outcome measures

- Many ways to measure BUT little comparability across tools
- Hinders ability to share, interpret, integrate results

Measurement systems already developed with NIH Funds

- **PROMIS®**: Patient Reported Outcomes Measurement Information System®
- **NIH Toolbox**: NIH Toolbox for Assessment of Neurological & Behavioral Function
- **Neuro-QOL**: Quality of Life Outcomes in Neurological Disorders
- **ASCQ-Me**: Adult Sickle Cell Quality of Life Measurement Information

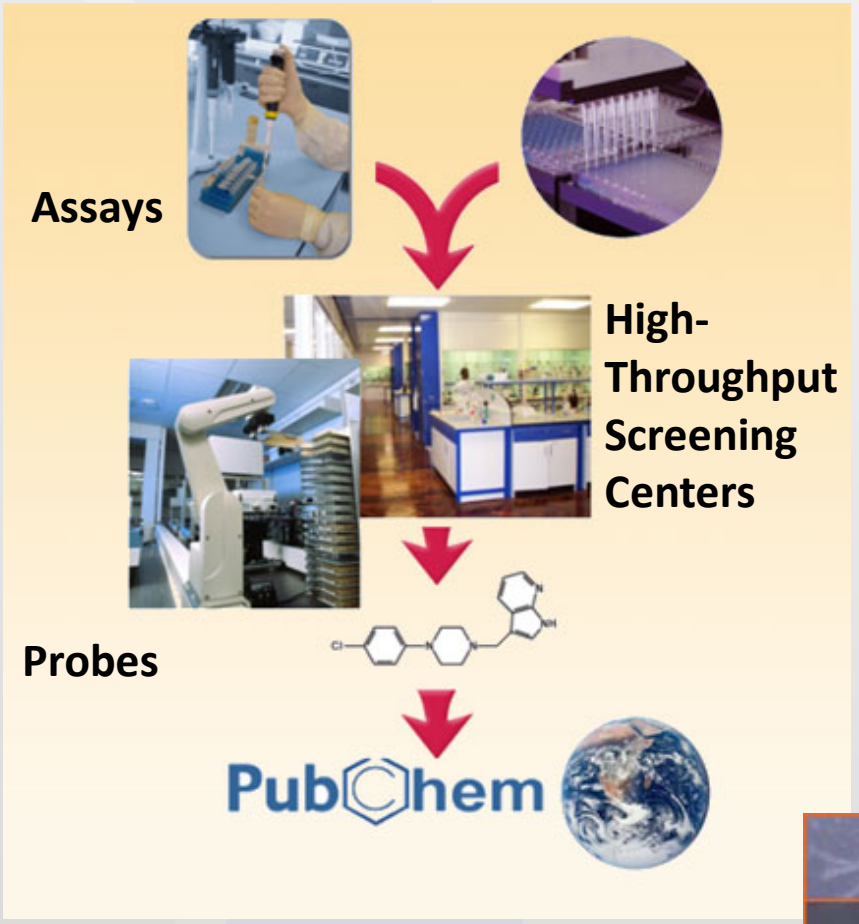
4-year Trans-NIH RFA (U2C) led by NCI with co-fund from 12 NIH ICs

- **GOALS: Integration, Dissemination, Sustainability**
- **Step-down funding (25-50% reductions in Years 3 and 4) - less reliance on NIH**
- **NCI Contact: Ashley Wilder Smith, PhD, MPH: Ashley.Smith@nih.gov**

Funding Amounts by NIH IC

IC	Amount (Thousands, Years 1 & 2)	Amount (Thousands, Year 3)	Amount (Thousands, Year 4)
NCI	$546	$424	$331
NINDS	$400	$300	$225
NHLBI	$354	$266	$199
NIA	$350	$265	$200
NIAMS	$250	$190	$140
NCCAM	$250	$190	$140
NIDDK	$250	$190	$140
NIH OD - OBSSR	$200	$200	$200
NIH OD - ORWH	$200	$100	$100
NIDCD	$100	$50	$25
NINR	$100	$75	$50
NIDA	$100	$75	$50
NIMH	$100	$75	$50
TOTAL	**$3.2M**	**$2.4M**	**$1.85M**

Molecular Libraries (2004-2014)

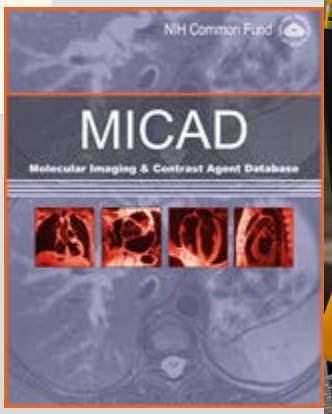


Small Molecule Repository

Compound Class	Number
Diversity Compounds (DC)	335,528
Controlled Substances (DEA)	141
Non-Commercial (NC)	38,626
Natural Products (NP)	1,956
Specialty/Known Bioactive (SS)	2,770
Targeted Libraries (TL)	10,791
Total	**389,812**

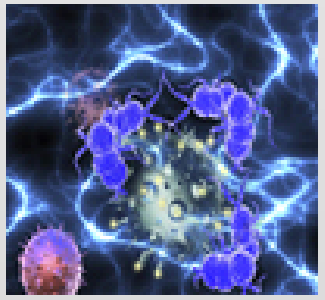
Program Outputs:

- 365 probes
- 26 in pre-clinical development
- 7 in clinical development
- 132 patented discoveries

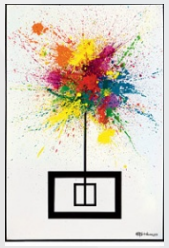


Library of Integrated Network-based Cellular Signatures (LINCS)

- LINCS Data Harnessed to Help Reveal How Cancer Cells Continuously Reproduce (Science, July 19, 2013)
- Drs. Sorger, Golub, and Califano are all part of the NCI ICBP program. There are significant synergies between the two programs
- The CF funds Dr. Golub to generate large sets of data
- ICBP uses the generated LINCS data
- LINCs integrates with the TCGA



High-Risk High-Reward (HRHR) Research Awards

	 TRANSFORMATIVE RESEARCH	 PIONEER	 NEW INNOVATOR	 EARLY INDEPENDENCE
Who?	All career stages	All career stages	Early stage Investigators	Junior investigators (within 1 year of Ph.D. or medical residency)
What?	Transformative ideas that may involve large budgets	Creative scientists proposing paradigm shifting research	Early stage investigators proposing high potential impact research	Junior scientists ready for research independence
	All areas of basic, clinical and translational science within the NIH mission			
Budget?	Up to $25 million per year for 5 years	Up to $500,000 per year for 5 years	Up to $300,000 per year for 5 years	Up to $250,000 per year for 5 years
Prelim data?	Preliminary data not required	Preliminary data not required	Preliminary data not required	Preliminary data requirements less stringent than R01 award

Imaging self-renewal and transformation in hematopoietic stem cells

Tannishtha Reya, PhD

Dr. Reya is using her Pioneer Award to develop high-resolution strategies to visualize the behavior of living stem cells during growth, regeneration, and cancer formation.

nature genetics

Lis1 regulates asymmetric division in hematopoietic stem cells and in leukemia

Bryan Zimdahl[1–3,12], Takahiro Ito[1,2,12], Allen Blevins[1,2], Jeevisha Bajaj[1,2], Takaaki Konuma[1,2], Joi Weeks[1,2], Claire S Koechlein[1,2], Hyog Young Kwon[1,2], Omead Arami[1,2], David Rizzieri[4], H Elizabeth Broome[5,6], Charles Chuah[7,8], Vivian G Oehler[9], Roman Sasik[10], Gary Hardiman[10,11] & Tannishtha Reya[1–3,6]

genes & development

Loss of β-catenin triggers oxidative stress and impairs hematopoietic regeneration

William Lento,[1,2,3,4] Takahiro Ito,[1,2] Chen Zhao,[3] Jeffrey R. Harris,[4] Wei Huang,[4] Chen Jiang,[5] Kouros Owzar,[5] Sadhna Piryani,[4] Luigi Racioppi,[4,6] Nelson Chao,[4] and Tannishtha Reya[1,2,3,7,8]

PNAS

Engineering a BCR-ABL–activated caspase for the selective elimination of leukemic cells

Manabu Kurokawa[a,b,1], Takahiro Ito[c,d], Chih-Sheng Yang[b], Chen Zhao[e], Andrew N. Macintyre[b], David A. Rizzieri[f], Jeffrey C. Rathmell[b], Michael W. Deininger[g], Tannishtha Reya[c,d], and Sally Kornbluth[b,1]

PNAS

β-Arrestin2 mediates the initiation and progression of myeloid leukemia

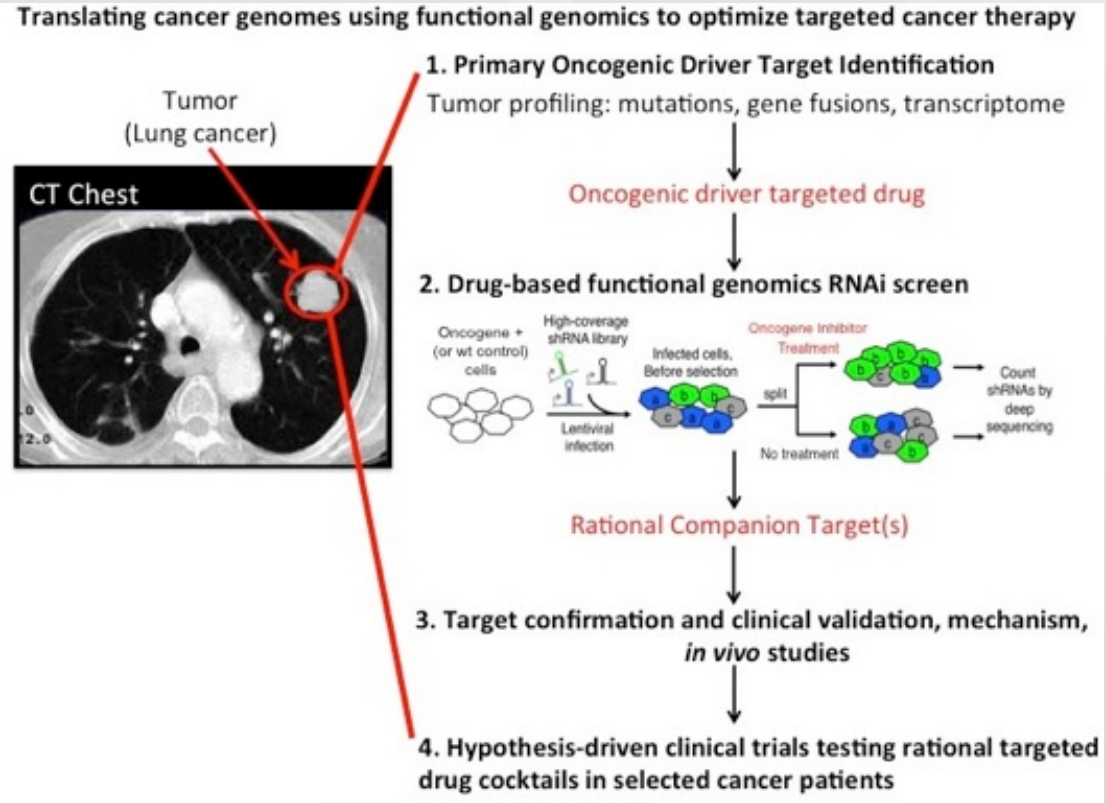
Mark Fereshteh[a,b,c], Takahiro Ito[a,1], Jeffrey J. Kovacs[c,1], Chen Zhao[b], Hyog Young Kwon[a], Valerie Tornini[b], Takaaki Konuma[a], Minyong Chen[c], Robert J. Lefkowitz[c,d,e,2], and Tannishtha Reya[a,b,2]

NIH DIRECTOR'S PIONEER A·W·A·R·D

Discovery of Rational Companion Therapeutic Targets to Optimize Cancer Treatment

Trever Bivona, MD, PhD

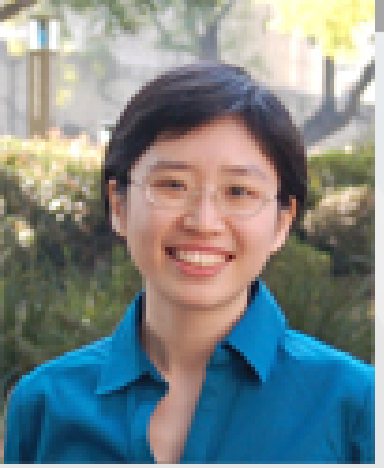
NIH DIRECTOR'S NEW INNOVATOR AWARD



Project goal: To create an intellectual foundation and experimental platform that will optimize the **personalized treatment of cancer patients** and improve their survival.

This new approach will use complementary tools, including

- cancer genomics
- genetic screens
- systems network analyses
- clinical therapeutics
- prospectively acquired human clinical data



Engineering of computational receptors and gene circuits for T-cell immunotherapy

Yvonne Chen, PhD

Dr. Chen's Early Independence Award will allow her to improve the safety and efficacy of adoptive T-cell therapy.

- Will address a critical barrier to progress by developing multi-functional genetic constructs previously unavailable in the T-cell therapy toolbox
- Will generate T cells with more robust and precisely targeted anti-tumor activities for immunotherapy against cancer

Cancer immunotherapy was named 2013 Breakthrough of the Year by Science.

NIH DIRECTOR'S EARLY INDEPENDENCE AWARD

The Need for Evaluation: What do we want to know?

Charge to the Council of Councils Common Fund Planning and Management Working Group

Assess and advise on the processes used to manage the CF, including those used to plan and implement/oversee programs.

1. Are planning processes optimal for identifying program areas that meet the CF criteria?
2. Are management/oversight processes optimal for achieving program goals?

Report presented on June 20, 2014

Council of Councils Common Fund Evaluation Overview of Recommendations

Strategic Planning

- Continue efforts to engage a broad range of stakeholders, while exploring new options for gathering ideas
- Enhance communication about the strategic planning process/activities, clearly articulate goals/criteria of Common Fund programs
- Allow greater flexibility in strategic planning and increase opportunities for feedback
- Enhance transparency of decision-making process

Program management

- Strengthen communication between Common Fund staff and IC Working Group members; strengthen communication between all NIH Working Group members and PIs
- Enhance evaluation of Common Fund programs
- Facilitate dissemination of information about Common Fund programs and their deliverables to the extramural research community

Thank you