American Cancer Society Research Program

Carolyn Bruzdzinski, PhD
Vice-President Regional Cancer Control
North Central Region
The Need to Better Understand the Cancer Epidemic

"... to investigate the conditions under which cancer is found and to compile statistics in regard thereto..."

Articles of Incorporation, American Cancer Society, 1944

1945: Gift from Mary Lasker
Research Investments

Intramural Research

WHAT
Epidemiology
Surveillance
Survivorship

HOW
Population
Studies

Factors affecting
Incidence and Mortality

Extramural Research

All Types of Cancer Research

A Wide Portfolio of Innovative Cancer Projects Across the US

Advances against All forms of cancer

ACS CAN

Advocacy for All Cancer Research

Lobby Federal Government to Increase NCI budget

More Federal support For cancer research

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For Nearly 70 Years, the Society’s Intramural Research Department has:

Supported evidence-based decision-making for the Society, medical community, legislators and public by:

- Monitoring the national and international cancer epidemic;
- Identifying preventable causes of cancer and cancer deaths, and ways to improve quality of cancer care and cancer survivorship;
- Informing and promoting the application of such knowledge to cancer control.
1946: ACS Intramural Research Begins

**Surveillance (& Health Services Research)**

- Monitor trends in cancer incidence, risk factors, screening behaviors, and treatment
Surveillance Service Publications

Cancer Facts & Figures (1952)
Cancer Prevention & Early Detection Facts & Figures (1992)
Cancer Facts & Figures for Hispanics/Latinos (2000)
Colorectal Cancer Facts & Figures (2005)
Global Cancer Facts & Figures (2007)
Cancer Treatment & Survivorship Facts & Figures (2012)

Available in PDF Format on ACS website
http://www.cancer.org/research/cancerfactsstatistics/index
1946: ACS Intramural Research Begins

**Surveillance (\& Health Services Research)**
- Monitor trends in cancer incidence, risk factors, screening behaviors, and treatment

**Epidemiology Research**
- Identify the causes of cancer and ways to prevent it
# The Cancer Prevention Studies

<table>
<thead>
<tr>
<th></th>
<th>Hammond-Horn</th>
<th>CPS-I</th>
<th>CPS-II</th>
<th>CPS-3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Participants</strong></td>
<td>188,000</td>
<td>1,000,000</td>
<td>1,200,000</td>
<td>304,000</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td>Men</td>
<td>Men &amp; Women</td>
<td>Men &amp; Women</td>
<td>Men &amp; Women</td>
</tr>
<tr>
<td><strong>States</strong></td>
<td>9</td>
<td>25</td>
<td>50</td>
<td>35+ PR</td>
</tr>
<tr>
<td><strong>Cancer endpoints</strong></td>
<td>Mortality</td>
<td>Mortality</td>
<td>Mortality  &amp; incidence*</td>
<td>Mortality  &amp; incidence</td>
</tr>
<tr>
<td><strong>Exposure emphasis</strong></td>
<td>Smoking</td>
<td>Smoking/obesity</td>
<td>Multiple</td>
<td>Multiple</td>
</tr>
</tbody>
</table>

*in the Nutrition Subcohort of approximately 184,000

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*These slides are the property of the presenter. Do you duplicate without consent.*
1995: Psychosocial & Behavioral Research For Cancer Prevention & Control

- **Surveillance (Health Services Research)**
  - Monitor trends in cancer incidence, risk factors, screening behaviors, and treatment

- **Epidemiology Research**
  - Identify the causes of cancer and ways to prevent it

- **Behavioral Research**
  - Increase understanding of behavioral and psychosocial aspects of cancer

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What is Behavioral Research?

- Knowledge, attitudes, & beliefs
  - Obesity causes cancer?
  - I don't have time for cancer screening!

- Health behaviors & coping
  - Diet, exercise, tobacco use
  - Compliance with cancer screening guidelines
  - Depression, anxiety, distress

- PROs and Clinical outcomes
  - Quality of life (QoL)
  - Risk for cancer diagnosis
  - Risk for cancer recurrence
  - Risk for mortality

- Social & Environmental Factors
  - Family and community
  - Social determinants

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1998: (Tobacco) Economic and Health Policy Unit

**Surveillance (\& Health Services Research)**
- Monitor trends in cancer incidence, risk factors, screening behaviors, and treatment

**Epidemiology Research**
- Identify the causes of cancer and ways to prevent it

**Behavioral Research**
- Identify ways to improve quality

**Economic & Health Policy Research**
- Study aspects of global economic and health policies on cancer risk factors and outcomes
The Tobacco Atlas, 5\textsuperscript{th} Edition
2005: Statistics and Evaluation Center

**Surveillance (\& Health Services Research)**
- Monitor trends in cancer incidence, risk factors, screening behaviors, and treatment

**Epidemiology Research**
- Identify the causes of cancer and ways to prevent it

**Behavioral Research**
- Identify ways to improve quality

**Economic \& Health Policy Research**
- Study aspects of global economic and health policies on cancer risk factors and outcomes

**Statistics and Evaluation Center**
- Deliver valid, reliable, and timely information for evidence-based mission delivery

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1946 - ACS Research Program began with $1 million raised by Mary Lasker.

The nation’s largest private, not-for-profit source of funds for cancer research.

Since 1946, over $4.5 billion invested in research related to cancer.

47 Nobel Laureates have been supported by ACS at early stages of their careers.

75% of NCI Cancer Center Directors are former grantees.

Over 23,000 investigators at more than 1100 institutions have been funded.

Contributions to innumerable advances in the understanding of causes of cancer, prevention of cancer, detection of cancer, treatment of cancer and improvement of patients’ lives.
Research Strategy:  
*Lifting Every Stone*

- Advancing understanding of cancer causes
- Improving screening, prevention, diagnosis, and prognosis
- Developing new treatments
- Helping patients, families, survivors
- Research to drive changes in policies or health practices
ACS Peer Review System

**Overview**

- April and October Deadlines
- ~1800 applications/yr

- **Two stage review process:**
  1. 6 Program Areas/20 Peer Review Expert Panels
     - Detailed review; rate and rank
  2. Extramural Council
     - Sets the paylines across the committees

➤ “Stakeholders” participate

Comprehensive, Competitive, Confidential, Independent
National Experts

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Extramural Research and Training Programs

William Chambers, PhD
SVP for Extramural Research

Michael Melner, PhD
Charles Saxe, PhD
William Phelps, PhD
Susanna Greer, PhD
Elvan Daniels, MD
Virginia Krawiec, MPA

Molecular Genetics and Biochemistry of Cancer
Cancer Cell Biology and Metastasis
Preclinical and Translational Cancer Research
Clinical Cancer Research, Nutrition and Immunology
Cancer Control and Prevention Research
Health Professional Training in Cancer Control

www.cancer.org ➔ Explore research ➔ Apply for a research grant ➔ Staff contacts

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# Extramural Research and Training Calendar

<table>
<thead>
<tr>
<th>Event</th>
<th>Spring</th>
<th>Fall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Deadlines</td>
<td>April 1</td>
<td>October 15(^{th})</td>
</tr>
<tr>
<td>Peer Review Meetings</td>
<td>June</td>
<td>January</td>
</tr>
<tr>
<td>Critiques to applicants</td>
<td>August 1</td>
<td>March 1</td>
</tr>
<tr>
<td>Council Meeting</td>
<td>Mid Sept</td>
<td>Mid March</td>
</tr>
<tr>
<td>Grantee Notification</td>
<td>End Sept</td>
<td>End March</td>
</tr>
<tr>
<td>Newly Awarded Announcement</td>
<td>Oct 1</td>
<td>April 1</td>
</tr>
<tr>
<td>Grantee Certificates</td>
<td>Nov 1</td>
<td>May 1</td>
</tr>
<tr>
<td>Grant Activation</td>
<td>Jan 1</td>
<td>July 1</td>
</tr>
</tbody>
</table>

Red color highlights Division Correspondence

These slides are the property of the presenter. Do you duplicate without consent.
2015 Program Areas Funding Research and Health Professional Training Grants

Amount Awarded: $93,592,474

- Cancer Cell Biology and Metastasis: $17,282,000 (18.5%)
- Molecular Genetics and Biochemistry of Cancer: $13,672,500 (14.6%)
- Preclinical and Translational Cancer Research: $17,737,700 (19.0%)
- Clinical Cancer Research, Nutrition and Immunology: $9,190,000 (9.8%)
- Cancer Control and Prevention Research: $24,867,630 (26.6%)
- Health Professional Training in Cancer Control: $2,282,644 (2.4%)
- Other*: $8,560,000 (9.1%)

2015 Funding by Selected Cancer Types
Total Awarded: $93.6 million

- **Brain Tumor**: $5.0 million
- **Breast Cancer**: $10.7 million
- **Colon and Rectal Cancer**: $8.8 million
- **Leukemia / Leukaemia**: $6.6 million
- **Lung Cancer**: $5.2 million
- **Myeloma**: $2.4 million
- **Ovarian Cancer**: $2.1 million
- **Pancreatic Cancer**: $3.8 million
- **Prostate Cancer**: $6.4 million
- **Skin Cancer**: $5.0 million
- **Other Cancers***: $12.3 million
- **Applies to all types of cancer**: $25.3 million

*Other cancer types include adrenocortical, bladder, blood, bone, cervical, endometrial, esophageal, gastrointestinal, head and neck, hodgkin lymphoma, kaposi sarcoma, kidney, liver, nervous system, neuroblastoma, non-hodgkin lymphoma, sarcoma, stomach, testicular and thyroid.

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2015 Funding across the Common Scientific Outline Cancer Continuum

Distribution of Funds
Amount Awarded: $93,592,474

- Biology: 34.1%
- Cause/Etiology: 11.9%
- Prevention: 5.2%
- Early Detection, Diagnosis and Prognosis: 5.1%
- Treatment: 17.0%
- Cancer Control, Survivorship, and Outcomes Research: 20.2%
- Not Categorized: 6.5%

*Categories are based on the Common Scientific Outline.
†Not Categorized: Three grant types are not classified using these categories: An Audrey Meyer Mars International Fellowship, Institutional Research Grants and Master’s Training Grants in Clinical Oncology Social Work.

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2015 Extramural Research Grants - Types of Applications Funded as a Percentage

Amount Awarded: $91,309,830

- Research Scholar Grants: 66.3%
- Institutional Research Grants: 6.6%
- Postdoctoral Fellowships: 8.2%
- Mentored Research Scholar Grants: 11.5%
- Professor Awards: 4.7%
- Pilot and Exploratory Projects in Palliative Care: 2.0%
- Pilot Studies Community Based Participatory Research to Reduce Cancer Health Disparities: 0.2%
- Research Scholar Grants - Insurance: 0.6%

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ACS* Funding of First Time RSGs vs. NCI† Funding of First Time R01s

(Number of newly funded proposals)

<table>
<thead>
<tr>
<th>Year</th>
<th>ACS No. of Grants</th>
<th>NCI No. of Grants</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>85</td>
<td>94</td>
</tr>
<tr>
<td>2003</td>
<td>210</td>
<td>208</td>
</tr>
<tr>
<td>2004</td>
<td>235</td>
<td>208</td>
</tr>
<tr>
<td>2005</td>
<td>184</td>
<td>184</td>
</tr>
<tr>
<td>2006†</td>
<td>229</td>
<td>103</td>
</tr>
<tr>
<td>2007</td>
<td>236</td>
<td>105</td>
</tr>
<tr>
<td>2008</td>
<td>235§</td>
<td>88</td>
</tr>
<tr>
<td>2009</td>
<td>238</td>
<td>88</td>
</tr>
<tr>
<td>2010</td>
<td>78</td>
<td>78</td>
</tr>
<tr>
<td>2011</td>
<td>184</td>
<td>87</td>
</tr>
<tr>
<td>2012</td>
<td>152</td>
<td>75</td>
</tr>
<tr>
<td>2013</td>
<td>146</td>
<td>70</td>
</tr>
<tr>
<td>2014</td>
<td>144</td>
<td>68</td>
</tr>
<tr>
<td>2015</td>
<td>126</td>
<td></td>
</tr>
</tbody>
</table>

ACS* includes RSGPBs, RSGHPs, and Targeted RSGs that are considered Beginning Investigators.
NCI numbers reflect numbers that are published on NCI's website.

† NCI numbers are based on NCI's process of using a validated data element used to track new investigators that allows reporting of validated, more accurate numbers. Numbers for 2011-2015 reflect numbers that are published on NCI's website.

ǂ RSG eligibility criteria for applicants changed from in the first eight years to in the first six of independent research careers years reflected in July 2005 awards.
§ Includes R0-1 Awards from the American Recovery and Reinvestment Act (n=33).

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2,175 grants in the amount of $310.7 million have been funded at ~ 81 different institutions

<table>
<thead>
<tr>
<th>Lakeshore institutions with most grants</th>
<th># of Grants</th>
<th>Grant Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Indiana</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indiana University, Indianapolis</td>
<td>175</td>
<td>$ 24.4 million</td>
</tr>
<tr>
<td>Purdue University</td>
<td>86</td>
<td>$ 13.4 million</td>
</tr>
<tr>
<td>Indiana University, Bloomington</td>
<td>44</td>
<td>$ 6.8 million</td>
</tr>
<tr>
<td><strong>Illinois</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>University of Chicago</td>
<td>384</td>
<td>$ 59.9 million</td>
</tr>
<tr>
<td>Northwestern University, Evanston Campus</td>
<td>191</td>
<td>$ 26.8 million</td>
</tr>
<tr>
<td>University of Illinois, Chicago</td>
<td>180</td>
<td>$ 22.5 million</td>
</tr>
<tr>
<td><strong>Michigan</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>University of Michigan</td>
<td>375</td>
<td>$ 66.3 million</td>
</tr>
<tr>
<td>Wayne State University</td>
<td>138</td>
<td>$ 19.6 million</td>
</tr>
<tr>
<td>Michigan State University</td>
<td>68</td>
<td>$ 11.2 million</td>
</tr>
</tbody>
</table>
# New Grantees

<table>
<thead>
<tr>
<th>Grantee</th>
<th>Institution</th>
<th>Project Title</th>
<th>Grant Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matthew L. Bochman, PhD</td>
<td>Indiana University, Bloomington</td>
<td>Determining the Roles of RecQ4 Family Helicases in Genome Maintenance</td>
<td>$ 788,000</td>
</tr>
<tr>
<td>Mark R. Kelley, PhD</td>
<td>Indiana University, Indianapolis</td>
<td>Institutional Research Grant*</td>
<td>$ 360,000</td>
</tr>
<tr>
<td>Michael K. Wendt, PhD</td>
<td>Purdue University</td>
<td>Targeting Matrix-Mediated Drug Resistance in Metastatic Breast Cancer</td>
<td>$ 792,000</td>
</tr>
<tr>
<td>Stephanie K. Watkins, PhD</td>
<td>Loyola University, Chicago</td>
<td>Anti-tumor Immune Responses Impacted by Gender</td>
<td>$ 772,000</td>
</tr>
<tr>
<td>Rena Conti, PhD</td>
<td>University of Chicago</td>
<td>Generic Cancer Drugs: Pricing and Affordability</td>
<td>$ 792,000</td>
</tr>
<tr>
<td>Michelle M. LeBeau, PhD</td>
<td>University of Chicago</td>
<td>Institutional Research Grant*</td>
<td>$ 270,000</td>
</tr>
<tr>
<td>Zain Paroo, PhD</td>
<td>University of Illinois, Chicago</td>
<td>Rescuing Dicer Defects</td>
<td>$ 792,000</td>
</tr>
<tr>
<td>Daryl Staveness, PhD</td>
<td>University of Michigan</td>
<td>Re-Engineering Toxic Aniline-Based Drugs with 1-Aminonorbornane Isosteres</td>
<td>$ 163,500</td>
</tr>
</tbody>
</table>

*IRGs are renewals
Research Expansion
• Chart the Course:
• Research Expansion

Define the research continuum from bench to community

Catalogue scope of the research efforts

Unconstrained research delivery model(s) for funding success
• Chart the Course:
• Research Expansion

Funding Platforms:
- Innovation Laboratory
- Mission Outcomes Incubator
- Venture Fund

Marketing and implementation of funding opportunities to double the research budget
Research Pillars
1. Pushing innovation
2. Driving mission impact
3. Bringing brilliant young minds to cancer research
4. Accelerating progress with strategic focus
Pushing Innovation

• Provide new means of pooling funds
• Establish joint research funding ventures
• Renew the Research Professor/Clinical Research Professor Program
• Develop new platforms for team science
• Promote targeted research boosting opportunities
• Establish an elite cancer discovery fellows program
Driving Mission Impact

• Establish and grow mission centers
• Establish and endow a distinguished research scholars program
• Develop an epidemiology fellows program
• Redefine and expand the Health Professional Training Program (Center)
• Develop new platforms for team science
Bringing Brilliant Young Minds to Cancer Research

- Pilot project funding through institutional research grants
- Establish the cancer discovery fellows program
- A new launch/boost integrated model
Accelerating Progress With Strategic Focus

• Seek strategic alliances with other research institutions which provide synergy in driving advances
• Funding consortia/team science by leveraging a ‘dream team’ approach
• Support unique research projects
• Renew the Research Professor/Clinical Research Professor Program