Markey Cancer Center and National Cancer Institute Update

David M. Gosky, MA, MBA

Markey Cancer Affiliate Network Annual Meeting

April 26, 2013
Our Mission

- To reduce cancer mortality in our region through a comprehensive program of cancer research, treatment, education, and community engagement with a particular focus on the underserved population of Appalachian Kentucky.
Significant Burden of Cancer in Kentucky

- **1st** in the nation in overall cancer mortality rate

- **2nd** highest incidence rate for all cancer sites
  - Lung and bronchus (1st); colon and rectum (1st); oral cavity and pharynx (1st); kidney and pelvis (2nd); brain (3rd); cervix (8th)

- Cancer incidence and mortality are highest in Appalachia, especially for lung, colorectal, and cervical cancer

<table>
<thead>
<tr>
<th>Age-adjusted cancer mortality rates, 2005 – 2009</th>
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</thead>
<tbody>
<tr>
<td></td>
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<tr>
<td>All Cancers</td>
</tr>
<tr>
<td>U.S.</td>
</tr>
<tr>
<td>Kentucky†</td>
</tr>
<tr>
<td>Appalachian Kentucky*</td>
</tr>
</tbody>
</table>

† p<0.05 vs U.S. as a whole; * p<.05 vs Kentucky as a whole. National Cancer for Health Statistics and Kentucky Cancer Registry.
Appalachian county economic status (2011-12)

- Cancer
- Obesity
- Smoking
- Poverty
MCC Catchment Area

- 74 KY counties (54 KY Appalachian)
- 73% rural
- 22.1% below poverty level
APPLICATION SUBMITTED
Sept. 25, 2012

Site visit completed
Jan. 30, 2013

Draft comments received
March 18, 2013
MCC Research Programs

Cancer Prevention and Control

- Drs. Jeff Moscow and Jon Thorson
  - 45 members
  - $5.6 million (44% NCI)

Cancer Cell Biology and Signaling

- Drs. Thomas Tucker and Mark Dignan
  - 22 members
  - $8.1 million (16% NCI)

Redox Injury and Repair

- Drs. Vivek Rangnekar and Rina Plattner
  - 26 members
  - $4.3 million (35% NCI)

Drug Discovery, Delivery, and Translational Therapeutics

- Drs. Daret St. Clair and Mary Vore
  - 21 members
  - $5.2 million (46% NCI)
# Strong Cancer Funding

(Updated through December 31, 2012)

<table>
<thead>
<tr>
<th>Funding source</th>
<th>Total # of projects</th>
<th>Sum of direct costs</th>
<th>Sum of total costs</th>
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<tbody>
<tr>
<td>NCI</td>
<td>49</td>
<td>$7,635,845</td>
<td>$10,103,084</td>
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<tr>
<td>Other NIH</td>
<td>40</td>
<td>$6,582,993</td>
<td>$9,163,027</td>
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<tr>
<td>ACS, NSF, Other Peer Reviewed</td>
<td>13</td>
<td>$3,778,808</td>
<td>$4,780,801</td>
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<tr>
<td>Non Peer Reviewed</td>
<td>49</td>
<td>$4,563,097</td>
<td>$4,821,544</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>151</strong></td>
<td><strong>$22,560,743</strong></td>
<td><strong>$28,868,456</strong></td>
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</tbody>
</table>

- Non Peer Reviewed, 17%
- Other Peer Reviewed, 16%
- Other NIH, 32%
- NCI, 35%
Increased Therapeutic Trial Accruals
(updated: January 1, 2012 to December 31, 2012)

*52% Appalachian residents
Training the Next Generation of Transdisciplinary Cancer Scientists

- “Training Program in Oxidative Stress and Nutrition” (T32 DK007778)†
- “Molecular Mechanisms of Toxicity Training Grant” (T32 ES007266)†
- “UK Cancer Nanotechnology Training Center” (R25 CA153954)*
- “Oncology Research Training for Surgeon Scientists” (T32 CA160003)*
- “Physician Training Award in Cancer Prevention” (ACS)*
- “Interdisciplinary Research Training in Cancer Biology” (T32 CA165990)*

(†Renewed since 2009; *New since 2009)

50 Pilot Projects awarded – $4.5M
23 received external grant awards - $17.3M

Tobacco regulatory science studies

Wnt/β-catenin inhibition by resveratrol and its derivatives

Mc1r in melanocyte UV-Induced DNA damage and repair

Identification of novel lung cancer proteins

E. Hahn, RN, PhD (CP)
R01 ES021502
P50 (Pending)

C. Liu, PhD (CS)
R21 CA139359
Liu-Watt, LLC

J. D’Orazio, MD, PhD (RR)
R01 CA131075
R03 CA125782

E. Hirschowitz, MD (DT)
R01 CA100323
R03 CA162520
Clinical Trial
Achieving Bench-to-Bedside Translation

- Over the last 5 years, 6 concepts, compounds, or devices developed by MCC investigators have entered clinical development.
- Many other projects at various stages of preclinical development.

- Ruthenium complexes
- Prenyl function inhibitors
- PAR4 secretagogues
- Snail function inhibitors
- 4E-BP1 phosphorylation inhibitors
- pRNA delivery system
- Hyperthermia in NSCLC
- Amifostine aerosol
- FIDAS analogs for hMAT2A inhibition
- Immunoproteasome inhibitor (UK-101)
- Thiaminase
- Mithramycin analog
- DMAPT (Phase I)
- AR-67 (Phase II)
- Bortezomib in AML (Phase III)
- NSCLC vaccine (pilot)
- MESNA plus doxorubicin (pilot)
- XRT optical monitoring (pilot)
Impactful
Innovative
Collaborative
Dynamic
Transformative

Markey makes a difference.
WAITING

MCC Director

Impact score: mid-May
Council decision: end of June
MCC Update
Clinical Growth
2012 - 2013
UK HealthCare Growth

Total Discharges

FY04 FY05 FY06 FY07 FY08 FY09 FY10 FY11 FY12 FY13 est.

19,664

Outpatient Cancer Visits

FY04 FY12

1,501

New Cancer Patients

FY04 FY12

1,501

2,722

82%

81%

82%

108%

72,551

34,927

35,700
FY13 Clinical Recruits

Lars Wagner, MD
Professor, Department of Pediatrics
Division Chief, Pediatric Oncology
- Recruited from Cincinnati Children’s Hospital

Patrick O’Donnell, MD, PhD
Assistant Professor, Department of Orthopedics
- Completed fellowship at University of Toronto, Mt. Sinai Hospital

Jerry Martin, MB, BCh
Assistant Professor, Department of Surgery
Division of Cardiothoracic Surgery
- Completed fellowships at UK and Duke University
Research Growth
2012- 2013
<table>
<thead>
<tr>
<th>PI</th>
<th>Sponsor</th>
<th>Grant Number</th>
<th>Dates</th>
<th>Title</th>
<th>Total</th>
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<tr>
<td>Bondada, Subbarao</td>
<td>NCI</td>
<td>R01 CA165469</td>
<td>2/7/13-1/31/18</td>
<td>Role of Tcl1 and Par-4 in regulation of chronic lymphocytic leukemia</td>
<td>$297,793</td>
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<td>Glazer, Edith</td>
<td>ACS</td>
<td>RSG-13-079-01-CDD</td>
<td>1/1/13-12/31/16</td>
<td>Ruthenium Complex Scaffolds for the Creation of Targeted Chemotherapeutics</td>
<td>$238,333</td>
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<tr>
<td>Hahn, Ellen</td>
<td>NIEHS</td>
<td>R01 ES021502</td>
<td>9/1/12-5/31/17</td>
<td>FRESH: Dual Home Screening for Lung Cancer Prevention</td>
<td>$450,790</td>
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<td>Hahn, Ellen</td>
<td>KYDPH</td>
<td>PON272812000</td>
<td>7/1/12-6/30/13</td>
<td>Community Partnerships for Tobacco Use Prevention (KDPH)</td>
<td>$114,263</td>
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<tr>
<td>Kyprianou, Natasha</td>
<td>Sanofi</td>
<td>NA</td>
<td>11/1/12-10/31/13</td>
<td>Effect of Microtubule-Targeting Chemotherapy on EMT in Prostate Cancer Model</td>
<td>$120,469</td>
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<td>Li, Guo-Min</td>
<td>NCI</td>
<td>R01 CA167181</td>
<td>2/15/13-1/31/18</td>
<td>Novel Mechanism of Genome Instability in Colorectal Cancer</td>
<td>$231,103</td>
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<td>Plattner, Rina</td>
<td>NCI</td>
<td>R01 CA166499</td>
<td>9/12/12-8/31/17</td>
<td>A Role for c-Abl/Arg in Melanoma Progression</td>
<td>$315,543</td>
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<td>Rangnekar, Vivek</td>
<td>NCI</td>
<td>T32 CA165990</td>
<td>4/1/13-3/31/16</td>
<td>Interdisciplinary Research Training in Cancer Biology</td>
<td>$209,977</td>
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<td>She, Qing-Bai</td>
<td>NCI</td>
<td>R01 CA175105</td>
<td>4/1/13-3/31/16</td>
<td>Targeting Translation Dependence in Colorectal Cancer Progression</td>
<td>$232,854</td>
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<td>Shi, Xianglin</td>
<td>NIEHS</td>
<td>R01 ES020137</td>
<td>9/1/12-5/31/13</td>
<td>MicroRNA-190 and Oxidative Stress in Arsenic Carcinogenesis</td>
<td>$100,238</td>
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<tr>
<td>Spear, Brett</td>
<td>NIGMS</td>
<td>R25 GM102776</td>
<td>9/1/12-6/30/17</td>
<td>Kentucky Bridge to a Biomedical Doctorate for Appalachian Students</td>
<td>$230,799</td>
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<tr>
<td>Zhang, Joy</td>
<td>NCI</td>
<td>R03 CA171604</td>
<td>9/1/12-8/31/14</td>
<td>Apple Peel Extract Inhibits Cr(VI)-induced Lung Cancer</td>
<td>$74,250</td>
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<td><strong>Total of All Grants</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>$4,861,167</strong></td>
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FY13 Research Recruits

Brady Reynolds, Ph.D.
Associate Professor, Behavioral Science
- Recruited from The Ohio State University

Meenakshi Upreti, Ph.D.
Assistant Professor, Pharmaceutical Science
- Recruited from the University of Arkansas for Medical Sciences
Other Achievements 2012 - 2013
National / International Conferences

2012

- Natural Products Symposium, August
- Inaugural Neuro-Oncology Mini Symposium, November

2013

- Inaugural Breast Cancer Symposium, March
- 2nd International Conference of RNA Nanotechnology and Therapeutics, April 3-5
- Neuroendocrine Tumor Regional Conference, April 19-20

Upcoming:

- 15th Annual Midwest DNA Repair Symposium, May 18
International Conference of RNA Nanotechnology and Therapeutics

Organized and chaired by Dr. Peixuan Guo
200+ participants from around the world (15 countries)
Markey Affiliate Network
Markey Cancer Center Affiliate Network

UK Markey Cancer Center Affiliates

- Ashland: Our Lady of Bellefonte Hospital
- Cynthiana: Harrison Memorial Hospital
- Danville: Commonwealth Cancer Center
- Frankfort: Frankfort Regional Medical Center
- Georgetown: Georgetown Community Hospital
- Hazard: Appalachian Regional Healthcare
- Louisville: Norton Cancer Institute
- Morehead: St. Claire Regional Medical Center
- Mt. Vernon: Rockcastle Regional Hospital and Respiratory Care Center

Potential Future Affiliates

- Elizabethtown: Hardin Memorial Hospital
MCCAN New Programs and Services for 2013

- MCCAN Case Conference Series
  - Broadcast live via UK TeleCare and webcast via CECentral
  - Continuing education credit offered

- Assistance with ACoS Commission on Cancer Accreditation

- Telegenetic Counseling Program
Closing Remarks
MCC Strategic Goals

- **Goal 1:** To establish the MCC as a transformational center dedicated to the prevention of cancers and the reduction of cancer burden and disparities with a focus on rural underrepresented communities of Appalachian Kentucky

- **Goal 2:** To be a nationally recognized leader in the diagnosis and treatment of cancers that have high incidence rates in Kentucky

- **Goal 3:** To increase MCC investigator-initiated clinical research and clinical trial accruals
Summary

Over the next 5 years, the MCC needs to ...

- Be bigger and stronger from a clinical and research perspective
- Increase our cancer-related funding
- Increase therapeutic clinical trial accruals to >15% of new patients
- Increase interactions with our affiliate hospitals
- Better consolidate and focus our educational mission
- Take Markey discoveries to clinical trials
- Maintain and increase our focus and interactions in our catchment population of Appalachian Kentucky
Thank you!