Aging Baby Boomers Predicted to Drive up Incidence of Cancer
The Virtuous Cycle of Research
Decryption of the Genetic Code

THEN
- DNA
- RNA
- Protein
- Cell & Tissue Function

NOW
- DNA
- RNA
- Protein
- Cell & Tissue Function
Follow the Signs to Cancer Prevention, Detection, Diagnosis and Treatment

**RISK ASSESSMENT**
Mutations in the BRCA 1 and 2 genes indicate a high risk of developing breast and ovarian cancers

**SCREENING FOR EARLY DETECTION**
Levels of proPSA and PCA3 in the blood and urine, respectively, help detect prostate cancer

**BIOMARKERS**

**PREVENTIVE AND TREATMENT DECISIONS**
A normal or altered form of the KRAS gene directs choice of colorectal cancer therapy

**DIAGNOSIS**
The OVA1™ panel of biomarkers is used to differentiate ovarian cancer from other benign conditions

**DRUG DEVELOPMENT**
Identification of the V600E mutation in the B-Raf protein directed the development of the targeted agent vemurafenib for melanoma
The Long and Difficult Road to a Clinically Useful Drug Candidate
The Protracted Process of Drug Development
Visualizing Cancer

A: Mammogram, MRI
B: Day 1, Day 4
C: DC-MRI, FDG-PET
D: FDG-PET, CT, MRI
An Ounce of Prevention is Worth a Pound of Cure

Estimated Percentage of Cancer Cases Caused by Identifiable and/or Potentially Preventable Factors

- Tobacco: 33%
- Excess weight and obesity: 20%
- Diet: 5%
- Lack of exercise: 5%
- Occupation: 5%
- Viruses: 5%
- Family history: 5%
- Alcohol: 3%
- UV and ionizing radiation: 2%
- Prescription drugs: 1%
- Reproductive factors: 3%
- Pollution: 2%
- Unknown: 11%
Public Health Initiatives Work

The diagram illustrates the relationship between per capita cigarette consumption and male lung cancer incidence over time, highlighting key events and initiatives. Key points include:

- **Great Depression**
- **End of World War II**
- **First Smoking-Cancer Concern**
- **First Surgeon General’s Report**
- **Fairness Doctrine Messages on TV and Radio**
- **Broadcast Ad Ban**
- **Non-Smokers Rights Movement Begins**

The graph shows fluctuations in per capita cigarette consumption and lung cancer incidence, with important milestones marked along the timeline.
Anti-Smoking Efforts: All Over the Map
Catching a Cause of Cancer

- Human Papillomavirus (HPV) 30.0%
- Epstein Barr Virus (EBV) 5.4%
- Helicobacter pylori 32.5%
- Hepatitis B virus (HBV) and Hepatitis C virus (HCV) 29.5%
- Other agents 2.6%
Energetic Causes of Cancer

- Natural background radiation: 82%
- Medical x-rays: 58%
- Nuclear medicine: 21%
- Consumer products: 16%
- Occupational radiation: 2%
- Fallout: 2%
- Nuclear fuel cycle: 2%

Man-made radiation: 18%

American Association for Cancer Research (AACR) Cancer Progress Report 2012
Small Genetic Steps for Cells Lead to a Giant Leap for Cancer
A New Drug, A New Approach to Stopping Breast Cancer
Many Avenues To Navigate Around a Drug
Where do Hormones Originate?
When the Immune System’s Brakes are Applied, Cancers Go
Clinically Identical, Molecularly Different
Genomic Medicine: Finding the Trees in the Forrest
The Public and Private Sectors Invest Heavily, but Differently, in Biomedical Research
A Bleak Outlook for the NIH Budget in FY 2013
The More We Know, the Faster We Go
Accumulation of Evidence in a Learning Healthcare System
Actions You Can Take to Reduce Your Cancer Risk

1. Physical Activity
2. Reduce Alcohol Intake
3. Reduce Sun Exposure
4. Healthy Diet
5. Preventive Medicines
6. Eliminate Tobacco Exposure

AACR Cancer Progress Report 2012
Molecularly Informed Clinical Trials