



# **Biotechnology in Virginia** **&** ***Technology-Based Economic Development Policy***

**Mark A. Herzog, Executive Director**



Agricultural Feedstock  
& Chemicals



Drugs &  
Pharmaceuticals

The biosciences industry sector is  
defined  
as including the following four subsectors:



Medical Devices &  
Equipment



Research, Testing &  
Medical Laboratories

# Why Bioscience?

- From 2001 to 2008, bioscience employment in Virginia **grew by 23%**, compared to 6% total growth statewide and 3.5% across all sectors in the US.
- Between 2001 and 2008, the number of Virginia bioscience companies **grew by 55%** compared to 18% private sector growth statewide and 14% across the US.
- Bioscience firms have a very high average “multiplier” or ripple effect on employment. For every one new bioscience job, **5.8 additional jobs** are created.

*“This is just the beginning of the biotech revolution. It will change our world more than computers did.”*

--Larry Ellison,  
CEO, Oracle



Source: 2010 BIO/Battelle Report

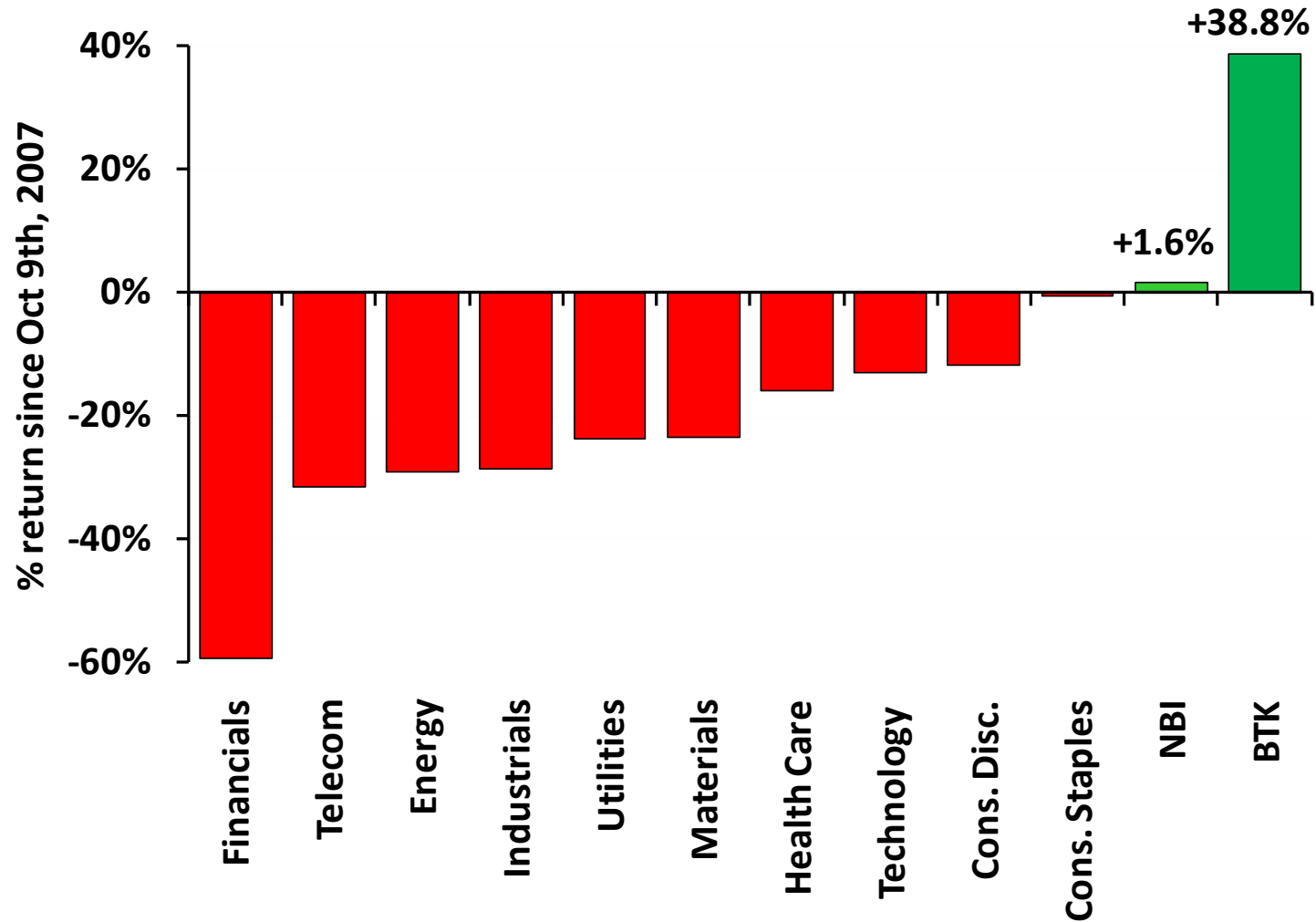
# Bioscience sector continues to be a source of high-wage jobs

The overall bioscience sector paid average annual wages of \$77,595 in 2008, **\$32,366 more** than the average annual wage of the total U.S. private sector.

Real earning for bioscience industry workers have increased by **10.1%** since 2001, compared with 3.2% for the U.S. private sector

U.S. Average Annual Wages per Employee, 2008	
Drug & Pharmaceuticals	\$ 93,378
Finance and Insurance	\$ 85,274
Research, Testing, & Medical Labs	\$ 80,785
Total Biosciences	<b>\$ 77,595</b>
Professionals, Scientists, and Technical Services	\$ 74,354
Agricultural Feedstock & Chemicals	\$ 72,279
Information	\$ 70,780
Medical Devices & Equipment	\$ 63,606
Manufacturing	\$ 54,392
Construction	\$ 49,014
U.S. Total Private Sector	\$ 45,229
Real Estate and Rental and Leasing	\$ 43,239
Transportation and Warehousing	\$ 42,969
Health Care and Social Assistance	\$ 42,150
Retail Trade	\$ 26,181

# Biotech Sector Performance

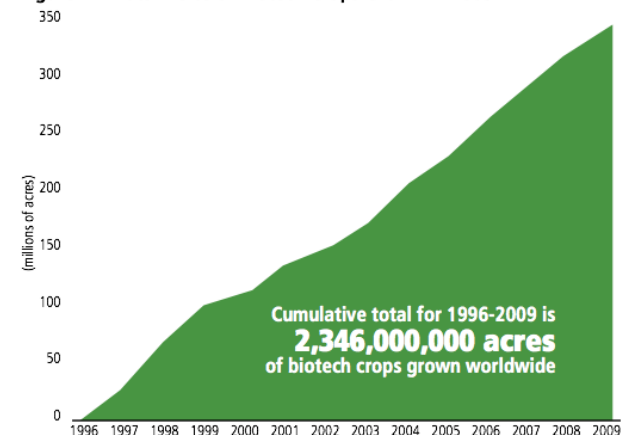


(Source: BIO, Factset, Sept. 27th, 2010)

# Biosciences in the USA: 2011

- There are more than **1,200** bioscience diagnostic tests in clinical use.
- More than **250** biotechnology products currently on the market.
- More than **600 new biologic medicines are in development** – including treatments for cancer, HIV/AIDS, Alzheimer's, and many other conditions.
- Life expectancy for cancer patients has **increased by 3 years** since 1980.
- Worldwide, 10.5 million cases of infectious diseases and 2.5 million child deaths are **prevented each year** through immunization.
- US Biotech industry in 2008: More than **3,000 biopharma companies and 1.42 Million jobs**
- Bioscience research is **61%** of all academic R&D in the USA

Figure 1-1: Total Acres of Biotech Crops Grown in 2009<sup>19</sup>



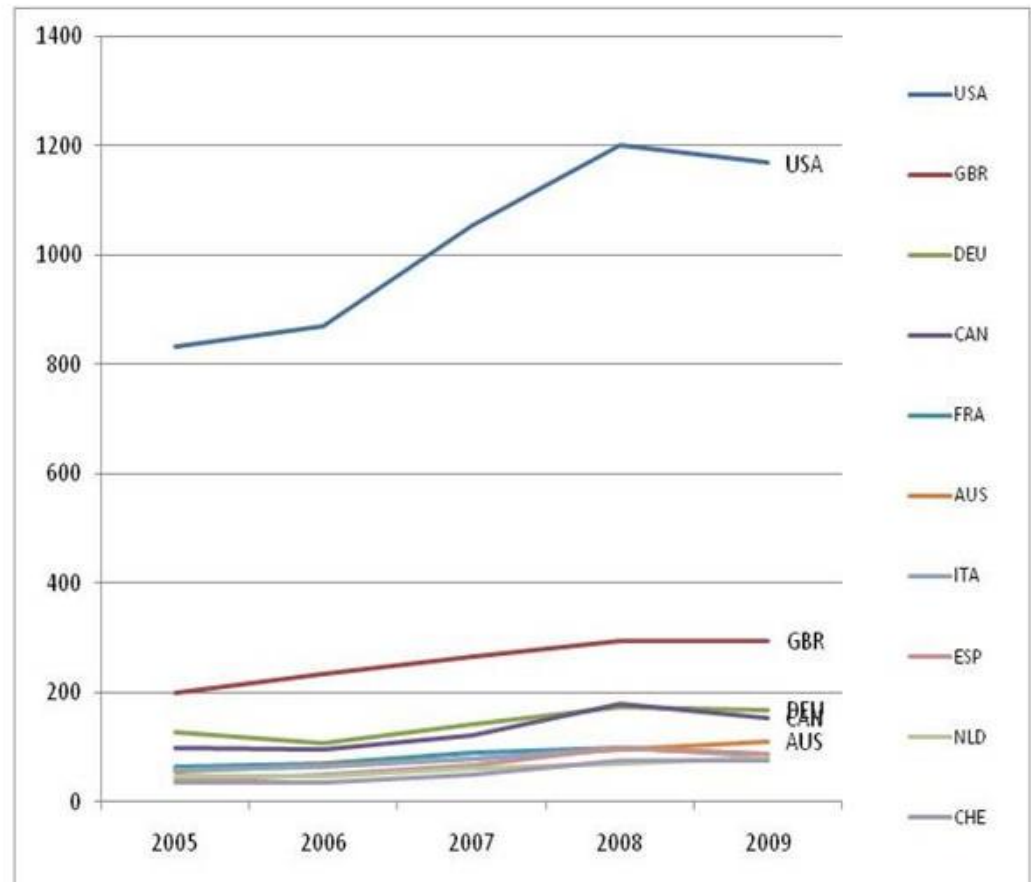
# Biosciences in the USA: 2011

In 2009, there were nearly **3,000** scientific articles on biomedical research published world wide.

- 1,169, approximately **40%**, were published by US researchers.
- Next closest competitor is the United Kingdom with about 300 articles.

**Forbes**

March 23, 2011



# Biosciences in Virginia: 2011

- Companies: 250-300; Average size: 6 employees
- Direct Employees: 20,000; Indirect Employees: Approximately 80,000
- Value of Products and Services: **\$13+ billion** (2006)
- Products Developed: 77; Products on the Market or in Trials: 50+
- Bioscience research = **52%** of all academic R&D in Virginia



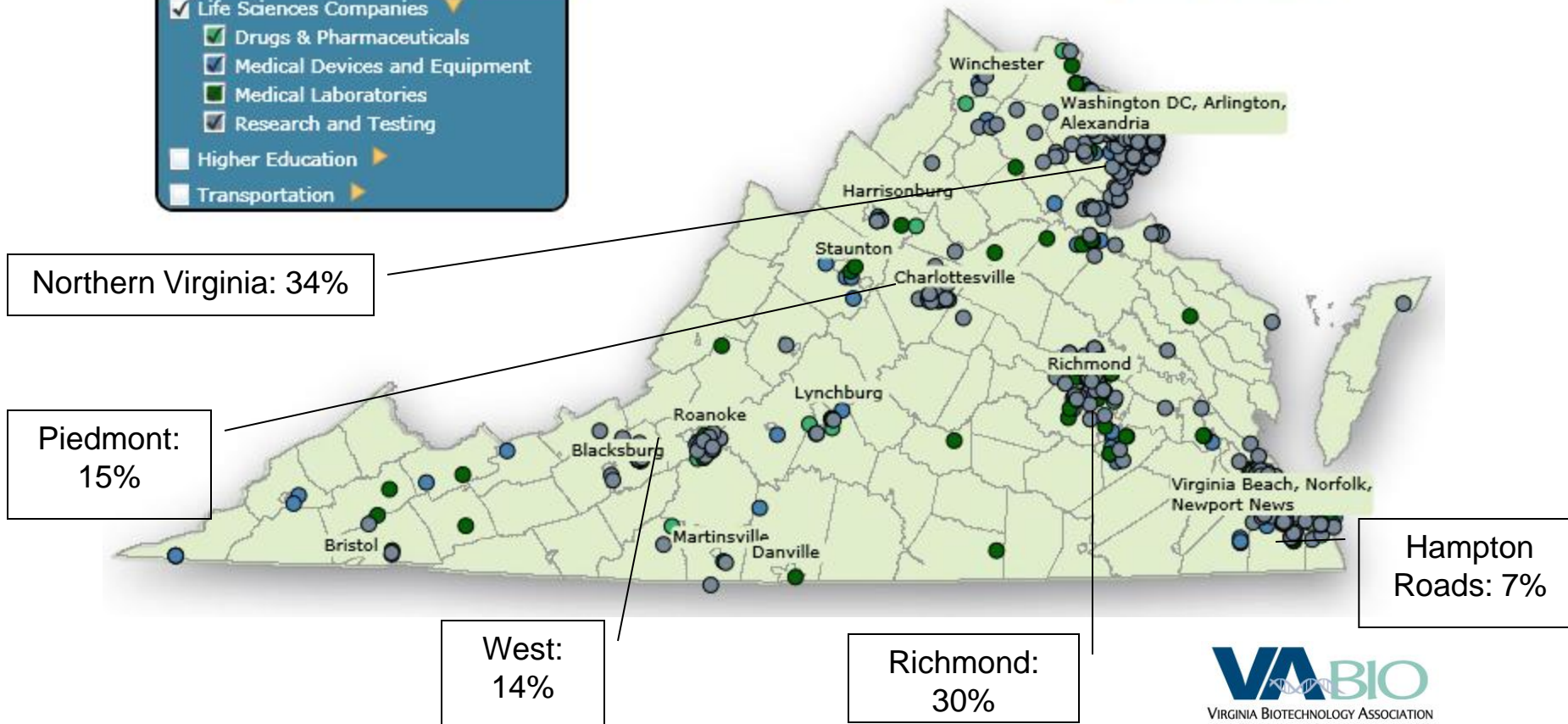
- Ranked **#19** for bioscience VC investments, '04-'09
- Ranked **#11** in bioscience academic degrees in 2008
- 2009: Virginia researchers initiated **more than 400** clinical trials of new medicines (cancer, heart disease)



# Virginia's Bioscience Concentration by Region



Counties Metro Areas



INSMED  
INCORPORATED

ATCC<sup>®</sup>  
The Global Bioresource Center<sup>™</sup>

barr  
Pharmaceuticals, Inc.

 **MERCK**

Mediatech, Inc. 

Vita Per  
HHMI  
Scientiam

  
SRI  
International<sup>®</sup>

 **Abbott**  
A Promise for Life

  
novozymes<sup>®</sup>  
Rethink Tomorrow

HealthDiagnosticLaboratoryInc.  
beyond disease diagnosis

 **Boehringer  
Ingelheim**

CELSCI  
Empowering Immune Defenses

  
Pfizer

 **BOSTWICK  
LABORATORIES<sup>®</sup>**

INTREXON

 **ECR Pharmaceuticals**

 **eurofins**

 **LifeNet Health<sup>®</sup>**  
Saving Lives, Restoring Health

Medinet

**VABIO**  
VIRGINIA BIOTECHNOLOGY ASSOCIATION

# Academic R&D Spending

## Why?

- Multiplier: For every \$1 spent = \$13.39 in increased GDP
- Multiplier: For every \$1 spent = \$1.39 in greater tax \$
- Economic impact from patents, “spin-outs” & licensing

## Academic Bioscience R&D Funding FY 2008

Rank	State	Total \$	\$ Per Capita
1	California	\$4.4 B	\$120.16
2	New York	\$2.7 B	\$137.55
3	Texas	\$2.5 B	\$100.80
4	Pennsylvania	\$1.6 B	\$128.52
5	North Carolina	\$1.5 B	\$164.10
6	Maryland	\$1.4 B	\$240.23
17	Virginia	\$550 M	\$70.55



# NIH Spending in Virginia

**FY 2009 Extra-Mural Research Funding: \$26 Billion**

## NIH Funding FY 2009

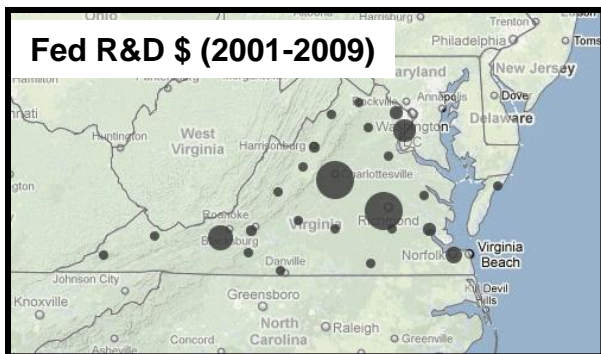


Rank	State	Total \$	\$ Per Capita
1	California	\$3.8 B	\$104.22
2	Massachusetts	\$2.8 B	\$429.80
3	New York	\$2.3 B	\$118.66
4	Pennsylvania	\$1.7 B	\$131.61
5	Texas	\$1.3 B	\$51.80
6	Maryland	\$1.2 B	\$207.24
<b>19</b>	<b>Virginia</b>	<b>\$380 M</b>	<b>\$48.24</b>

Virginia ranked **#52** in change in total NIH awards, 2004-2009. (VA: **-21%**; US: **+15%**)







# NIH Spending in VA

## FY 2010 Ranking of Virginia Institutions

Total Awards: \$276 Million

Rank	Name	Funding	National Rank
1	University of Virginia	\$133 M	44
2	Virginia Commonwealth University	\$82 M	71
3	Virginia Tech	\$16 M	202
4	George Mason University	\$4 M	356
5	Eastern Virginia Medical School	\$3 M	410
6	Old Dominion University	\$2.5 M	430
7	College of William & Mary	\$1 M	539
8	Virginia State University	\$790 K	644
9	Norfolk State University	\$206 K	933
10	James Madison University	\$173 K	976
11	Hampton University	\$ 172 K	977

# Virginia Bioscience Economic Development Policy:



## Studies and Commissions:

- Various reports from VRTAC, JCOTS, Commerce & Trade, etc.
- Governor Warner's Biotechnology Commission (2002-2005)
- Joint Legislative Study Commission on Biosciences (2008)

## Existing Policies (Pre-2009):

- A stable 6% corporate income tax that has not increased since 1972.
- 100% state sales tax exemption for R&D supplies & equipment.
- 100% state sales tax exemption for production equipment.
- Virginia Biotechnology Research Act (HB 725, 1994, § 2.2-5509)
- Virginia Technology Zone Act (HB 2312, 1995, § 58.1-3850)
- Virginia offers the CIT "GAP Fund" for seed-stage equity investments.

# CIT GAP FUNDS EVOLUTION

## GAP Fund I

## GAP Tech Fund

- IT/Telecommunications
  - Semiconductors/Electronics
  - Networking and Equipment
  - Industrial/Energy
  - Computers and Peripherals

## Current GAP Results

42 Investments  
15:1 Private Equity  
Leveraged  
14 Series A Investments  
5 Portfolio Exits

## GAP BioLife Fund

- Therapeutics
- Medical Devices/Instrumentation
- Bioinformatics
- Genomics and Proteomics
- Biodefense

# 2009 Virginia General Assembly Session

## SB 1338 (HB 2444, HB 2455):

- Tax Credit: Targets \$3M “Angel Investor Tax Credit” to bioscience and other advanced tech companies. **50% credit** up to \$50k. First 50% of \$5M fund held for university spin-outs
- SBIR/STTR Match: Authorizes \$50k matching grants for NIH Phase 1 SBIR/STTR awards (if funded)
- Wet-Lab Loan Fund: Allows for \$500,000 loan fund to build wet-labs for commercialization



## HB 2660/SB 1531: State's Six Year Capital Construction Priority Plan

- Recommends \$10M to \$25M for Biotech wet-lab construction



# Gov McDonnell **Highlights Biotech** in First “State of the Commonwealth” Speech

*"We will also target new Opportunity Fund dollars to the biotech industry. This is an industry of high-paying jobs in a fast-growing career field. Smart states look at this sector for future economic development. We will as well."*

[Gov. Robert F. McDonnell](#)  
January 18, 2010



# 2010 Virginia General Assembly Session

## “Virginia Innovation Investment Act”

**Income taxes, state; tax exemption for capital gains.** Chief Patrons: Delegate Sam Nixon of Chesterfield County ([HB 523](#)) and Senator Mark Herring of Loudoun County ([SB 428](#)).

Description: The “Virginia Innovation Investment Act” is a 100% capital gains exclusion on income earned from a qualified investment in an advanced technology company in Virginia for the next three years.



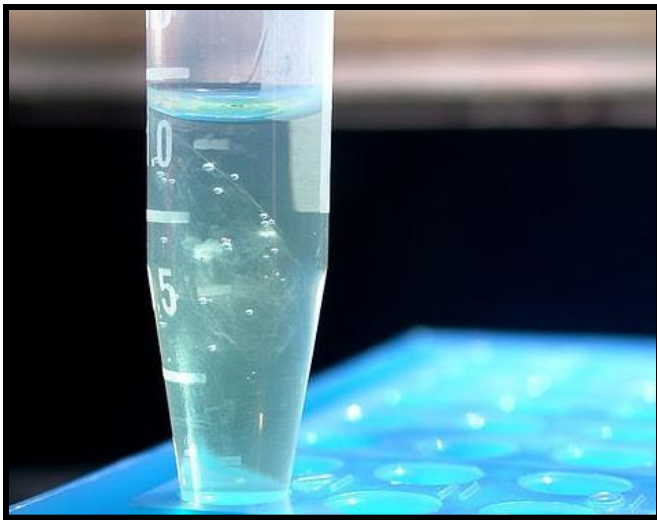
- Not a “Tax Credit” and no appropriation required by state
- Improves availability of start-up capital immediately
- Benefits professional investors (VCs) & companies as well as angels
- Jobs and investments years before tax exclusion is applied
- Impact on state limited to successful ventures at a later date

# 2011 Virginia General Assembly Session

## \$15 Million in New T-BED Funding

**1) Virginia Refundable Research & Development Tax Credit.** Chief Patrons: Delegate Ben Cline of Rockbridge County (HB 1447) and Senator Mark Herring of Loudoun County (SB 1326).

Description: Provides a 15% credit for qualified R&D expenses and 20% if in partnership with a VA public or private university. 100% refundable for “pre-profitable” companies. \$5M per year for the next four years.



## 2) Research and Innovation Initiatives

- \$2 Million for SBIR matching awards
- \$4 Million for the CIT “GAP” Fund
- Additional \$4 Million for the Commonwealth Research Commercialization Fund (CRCF)

In addition: **\$8 Million** for Cancer Research at UVa and VCU.

## Editorial

# Va. needs to focus on biotech

*One in an occasional series.*

In the University of Virginia, our Charlottesville region possesses one of the nation's top teaching hospitals and one of the nation's top business schools. For these reasons and more, our area already is doing well in biotech entrepreneurship.

But it could be positioned for even greater growth.

And the commonwealth as a whole would be smart to better support this important and growing industry, for the sake of economic and humanitarian advancement.

Biotech is a special industry, says Mark Herzog, executive director of the Virginia Biotechnology Association — both in its promise and in its needs.

» Some of the most exciting innovations in science are occurring in this field, including in such areas as potential cures for cancers and bioremediation of pollution. When this research comes to fruition, the gains for humanity will be enormous.

Already, quality and longevity of life are being immensely improved by biotech advances.

Although biotech scientists generally pursue their research for love rather than riches, the economic benefits from biotech also can be substantial. And it is economic benefit to the community, more than to the individual, that brings the biggest payoff.

Biotech firms need highly trained workers, who can be highly paid for their special skills, and that money helps feed the local economy.

## 2012 Virginia General Assembly Session

### What is next?

- “Virginia Innovation Fund” (VRS, VC Funds)
- State Economic Development Incentives
- Local Initiatives:
  - Technology Zones
  - BPOL Incentives
- Increased funding for:
  - Basic Research or NIH Award Incentives
  - CIT GAP Fund, Proof-of-concept loans
  - Existing Tax Credit Programs
  - CRCF (SBIR Matching Grants)
  - Expanded Clinical Trials
  - University Tech Transfer incentives

# 2011 BIO International Convention

**June 27-30**

Walter E. Washington Convention Center  
Washington, D.C.



Volunteer opportunities are available!

Visit [www.vabio.org](http://www.vabio.org) for more details



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