BIO'S EMERGING COMPANIES

APRIL 1, 2011

FOCUS ON ONCOLOGY

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A QUARTERLY REVIEW OF ISSUES, REGULATIONS, AND SCIENTIFIC DISCOVERIES IN THE FIELD OF ONCOLOGY TREATMENTS AND THERAPIES

INSIDE THIS ISSUE:

SPECIAL POINTS OF INTEREST:

- **NCATS and CAN funded for FY 2012 (p. 3)**
- **TREAT Act and FAST Act introduced to reform FDA (p. 4)**
- **Congress reauthorizes SBIR; passes JOBS Act (p. 6)**

RESEARCH TEAM FINDS A NEW BREAST CANCER SUSCEPTIBILITY GENE

Mutations in a gene called XRCC2 cause increased breast cancer risk, according to a study in the American Journal of Human Genetics. The study looked at families with a history of the disease but do not have mutations in currently known breast cancer susceptibility genes.

"We have added to the list of genes that harbour mutations causing breast cancer," said Dr. Sean Tavtigian. "This knowledge will improve breast cancer diagnostics and add years to patients' lives. More important, relatives who have not been affected by the disease but carry the mutations will benefit even more. They can find out they are at risk before they have cancer and take action to reduce their risk or catch the cancer early."

XRCC2 may also provide a new target for chemo. "A type of drug called a PARP inhibitor appears to kill tumor cells that have gene mutations in a particular DNA repair pathway. XRCC2is in this pathway, as are BRCA1 and BRCA2. It's reasonably likely that a breast cancer patient who has a mutation in XRCC2will respond well to treatment with PARP inhibitors," said Tavtigian.

Many breast cancer cases appear in families with a weak history of the disease. Only about 30% of the familial risk for breast cancer can be explained by a combination of mutations to & common sequence variation in the known breast cancer susceptibility genes. "So far most of the clinical diagnostic effort has been directed toward the very strong family history set of breast cancer cases and their close relatives," he says. "Our research looks at a population with a weaker family history, and as it turns out, a very rare gene mutation."

The researchers used a technology called exome capture massively parallel sequencing, which shows the exact order of the nucleotides in all of the protein coding genes in the human genome. The ability of technology to analyze DNA of all of the genes in the genome in a single experiment, makes it an amazingly powerful tool for genetic research.

"We focused on the genes involved in a particular type of DNA repair, because most known breast cancer genes have been found there. That analysis allowed us to identify XRCC2 as a breast cancer susceptibility gene in individuals with a family history of breast cancer," says Tavtigian. "From the exome sequencing data, we found two different types of XRCC2 mutations that occur in breast cancer patients."

He explains that one type of mutation causes the gene to create an incomplete version of the protein. The resulting protein is usually dysfunctional. The other type occurs when a single amino acid in the protein is changed. "It's a subtle change to the protein, but the resulting change in function could range anywhere from innocuous to even worse dysfunction than the incomplete protein causes."

For more information on this research, click here.

"A worldwide effort has already been launched to figure out what fraction of breast cancer is due to mutations in this gene and how high the risk conferred by these mutations actually is ."

Bio BIOTECHNOLOGY INDUSTRY ORGANIZATION

NCI FUNDING ANNOUCEMENTS

PAR-12-140, Role of the Microflora in the Etiology of Gastro-Intestinal Cancer (R01) – July 2, 2012

PAR-12-095, Basic Cancer Research in Cancer Health Disparities (U01) – June 20, 2012

PA-12-108, Assays for High Throughput Screening (HTS) to Discover Chemical Probes in the Molecular Libraries Probe Production Centers Network (MLPCN) (X01) – August 15, 2012

PAR-12-039, Small Grants Program for Cancer Epidemiology (R03) – July 17, 2012

PA-12-136, Translational Research at the Aging/Cancer Interface (TRACI) (R01) – June 5, 2012

PA-11-152, The Role of Microbial Metabolites in Cancer Prevention and Etiology (U01) – November 15, 2012

PA-11-297, Pilot studies in Pancreatic Cancer (R21)– June 16, 2012

PA-11-158, Biomarkers of Infection-Associated Cancers (R01) – June 5, 2012

PA-11-073, Mitochondria in Cancer Epidemiology, Detection, Diagnosis and Prognosis (R01) – June 5, 2012

For more information or to find more funding opportunities, please click here.

ADVISORY COMMITTEE MARCH MEETINGS

On March 20, ODAC met to discuss sNDA 022465/S-010, trade name Votrient (pazopanib hydrochloride) tablets, application submitted by GlaxoSmithKline. The proposed indication is for treatment of patients with advanced soft tissue sarcoma who have received prior chemotherapy.

The committee also discussed NDA 022576, with the proposed trade name Taltorvic (ridaforolimus) tablets, application submitted by Merck. The proposed indication is for treatment of adult & pediatric patients with metastatic soft tissue sarcoma or bone sarcoma as a maintenance therapy.

On March 21, the committee discussed NDA 202497, proposed trade name Marqibo (vincristine sulfate liposomes injection), application submitted by Talon Therapeutics. The proposed indication is for the treatment of adult patients with Philadelphia Chromosome-negative acute lymphoblastic leukemia in 2nd or greater relapse or whose disease has progressed following 2 or more treatment lines of anti-leukemia therapy.

For more info, click here (3/20) or here (3/21).

Oncologic Drugs Advisory Committee

2012 Meeting Schedule

February 8-9
March 20-21
June 20-21
July 24-25
September 12-13
November 6-7
December 4-5

ADVISORY COMMITTEE FEBRUARY MEETINGS

On February 8, ODAC met to discuss supplemental biologics license application 125320/28 for XGEVA (denosumab) injection, application submitted by Amgen Inc. The proposed indication for this product is for the treatment of men with castrate-resistant prostate cancer at high risk of developing bone metastases, or spread of cancer to the bones. (For minutes, click here.)

On February 9, the committee discussed supplemental new drug application (sNDA) 21790/010 for Dacogen (decitabine) for injection, application submitted by Eisai Inc. The proposed indication for this product is for the treatment of acute myelogenous leukemia in adults 65 years of age or older who are not considered candidates for induction chemotherapy. (For minutes, click here.)

FY 2012 FUNDING FOR NCATS AND CAN

On December 23, 2011, President Obama signed into law the Consolidated Appropriations Act, which appropriated funds for various federal agencies, including the National Institutes of Health (NIH). Included in NIH's $30.690 billion budget authority was an appropriation of $576.5 million for the newly-authorized National Center for Advancing Translational Sciences (NCATS). The goal of the Center is to work in partnership with the public and private sectors to develop innovative ways to overcome obstacles in the translational science pipeline.

NCATS unifies certain existing NIH programs to accomplish these goals, including the Clinical and Translational Science Awards, the Office of Rare Diseases and Research, the Therapeutics for Rare and Neglected Diseases (TRND) program, the Bridging Interventional Development Gaps program, and the NIH Chemical Genomics Center. NCATS will also develop the Cures Acceleration Network (CAN), which was authorized in 2010 and recently appropriated $10 million in new funds to help bridge the "valley of death" between basic and clinical research.

FY 2012 Funding Levels

NIH
$30.690 billion

NCATS
$576.5 million

CAN
$10 million

NCI
$5.08 billion

NEW TECHNOLOGIES AVAILABLE FOR LICENSING FROM NIH TECHNOLOGY TRANSFER OFFICE

MUC-1 Tumor Antigen Agonist Epitopes for Enhancing T-cell Responses to Human Tumors

The C-terminus region of MUC-1 (MUC-1C) has been shown to be an oncogene & has been associated with a more aggressive phenotype in several different cancers. Scientists at NIH have identified 7 new agonist epitopes of MUC-1 tumor associated antigen. Peptides reflecting these agonist epitopes have been shown to enhance the generation of human tumor cells, which have a greater ability to kill human tumor cells endogenously expressing the native MUC-1 epitope. The technology encompasses the use of these agonist epitopes in peptide- & protein-based vaccines, with dendritic cells or other antigen presenting cells, or encoding sequences in DNA, viral, bacterial, yeast, or other types of vectors, or to stimulate T-cells in vitro for adoptive immunotherapy protocols.

Novel Diagnostic, Prognostic and Therapeutic Biomarker for Hepatocellular Carcinoma

Scientists at NCI have discovered that Stearol-CoA desaturase-1 (SCD-1) is associated with hepatocellular carcinoma (HCC). Utilizing a microarray to analyze HCC patient samples, the investigators found SCD-1 is elevated in liver tumor tissues and it is a marker for a highly aggressive form of HCC, hepatic stem cell-like HCC subtype (HpSC HCC). The investigators found SCD-1 is significantly elevated in HpSC tumors in comparison to less aggressive HCC tumors and it is associated with poor patient survival. In vitro studies demonstrate SCD-1 inhibition and/or addition of saturated palmitic acid reduces HpSC HCC characteristics.

To view full descriptions of these technologies and to find others available for licensing, please click here.

PATIENT ORGANIZATION EVENTS

American Society of Clinical Oncology	Skin Cancer Foundation	American Institute for Cancer Research
Annual Meeting June 1-5, 2012 Chicago, Illinois	World Congress August 1-4, 2012 Sao Paulo, Brazil	Annual Research Conference November 1-2, 2012 Washington, D.C.
Click here for more details.	Click here for more details.	Click here for more details.

FDA REFORM LEGISLATION

BIO supports two pieces of legislation that would reform and modernize the FDA to speed life-saving treatments and breakthrough medicines to patients living with debilitating diseases. BIO CEO Jim Greenwood issued statements praising both the **TREAT Act** and the **FAST Act**. BIO has also testified on the Hill in support of the proposed reforms.

S. 2113 – Transforming the Regulatory Environment to Accelerate Access to Treatments (TREAT) Act
This bill would ***reform the FDA*** by advancing regulatory science and innovation, elevating FDA and empowering operational excellence, and enabling modernized patient-centric clinical development. Specific proposed reforms include updating FDA's mission statement, enhancing the agency's access to external scientific experts, and ***strengthening the Accelerated Approval pathway***.

Sponsor: Sen. Kay Hagan (NC)
Status: Referred to the Senate HELP Committee

H.R. 4132 – Faster Access to Specialized Treatments (FAST) Act
This bill would reform the Accelerated Approval pathway at the FDA to ***expedite the approval of drugs*** for serious of life-threatening diseases or conditions while maintaining important safety standards.

Sponsors: Rep. Cliff Stearns (FL-6) and Rep. Edolphus Towns (NY-10)
Status: Referred to the House Committee on Energy and Commerce

ONCOLOGY-FOCUSED LEGISLATION

H.R. 1394 – Lung Cancer Mortality Reduction Act
This bill would require the Secretary of HHS to implement a program to achieve a ***50% reduction in the mortality rate of lung cancer by 2020*** and require the CDC to establish a Lung Cancer Early Detection Program.

Sponsor: Rep. Donna Christensen (VI)
Status: Referred to the House Committee on Energy and Commerce

H.R. 733 – Pancreatic Cancer Research and Education Act
This bill would require the Secretary of HHS to establish and implement a ***Pancreatic Cancer Initiative*** to assist in coordinating activities to address the high mortality rate associated with pancreatic cancer.

Sponsor: Rep. Anna G. Eshoo (CA-14)
Status: Referred to the House Committee on Energy and Commerce

H.R. 912 – Colorectal Cancer Prevention, Early Detection, and Treatment Act
This bill would allow the Secretary of HHS to make grants to states to carry out programs to increase quality colorectal cancer screening. Gives priority to low-income individuals who lack adequate coverage,

Sponsor: Rep. Kay Granger (TX-12)
Status: Referred to the House Committee on Energy and Commerce

H.R. 1970 – National Childhood Brain Tumor Prevention Network Act
This bill would require a National Childhood Brain Tumor Prevention Network to provide grants and coordinate research with respect to the causes of and risk factors associated with childhood brain tumors.

Sponsor: Rep Barbara Lee (CA-9)
Status: Referred to House Committee on Energy and Commerce

H.R. 1988 – Qualifying Therapeutic Discovery Project Tax Credit Extension Act
This bill would ***extend the Therapeutic Discovery Project*** through the year 2017 and ***fund it at $1 billion per year***. Qualifying investments in years 2011 through 2015 would qualify for the credit or grant.

Sponsors: Rep. Susan Davis (CA-53) and Rep. Allyson Schwartz (PA-13)
Status: Referred to the House Committee on Energy and Commerce

HOUSE OF REPRESENTATIVES HEARINGS ON BIOTECHNOLOGY

House Energy and Commerce Committee, Subcommittee on Health
"FDA User Fees 2012: Hearing on Issues Related to Accelerated Approval, Medical Gas, Antibiotic Development and Downstream Pharmaceutical Supply Chain" — March 8, 2012

At this hearing, the Health Subcommittee heard from a variety of industries that are regulated by the FDA and depending on the User Fee Acts being reauthorized. For the biopharmaceutical industry, the committee focused on the FDA Accelerated Approval process. BIO Board Member John Maraganore testified on the importance of the Accelerated Approval pathway and in support of the FAST Act, which would enhance Accelerated Approval at FDA.

House Appropriations Committee, Subcommittee on Labor, HHS, Education, & Related Agencies
"Budget Hearing – Department of Health and Human Services – NIH" — March 20, 2012

This hearing focused on the newly-established National Center for Advancing Translational Sciences (NCATS) at NIH. NIH Director Collins and NCATS Acting Director Insel testified on the process of getting NCATS up and running and the expectations they have for the Center. Industry representatives, including BIO Board Member Scott Koenig, testified on the importance of NCATS and the key role it will play in advancing translational research.

House Committee on Science, Space, and Technology, Subcommittee on Technology and Innovation
"Fostering the U.S. Competitive Edge" — March 27, 2012

The Technology and Innovation Subcommittee held this hearing to better understand how federal policies and regulations affect competition, innovation, and job growth. BIO Board Chairman Ron Cohen testified on several steps that Congress has already taken to spur innovation, including SBIR, TDP, and patent reform. He also spoke in favor of reforms to the Accelerated Approval pathway at FDA.

SENATE HEARINGS ON BIOTECHNOLOGY

Senate Committee on Banking, Housing, and Urban Affairs
"Spurring Job Growth Through Capital Formation While Protecting Investors, Part II" — March 6, 2012

The Senate Banking Committee held this hearing to discuss several proposals on how to ease capital formation for emerging companies. The bills under consideration included an on-ramp to the public market for emerging growth companies and reforms to SEC Regulation A, SEC Regulation D, and the SEC private shareholder limit. OncoMed Pharmaceuticals CFO Will Waddill testified on how these policies would affect growing biotech companies and stimulate innovation and job growth. The legislation that BIO supported at the hearing was later combined into one bill and passed as the JOBS Act.

Senate Committee on Health, Education, Labor, and Pensions
"Strengthening FDA and the Medical Products Industry for the Benefit of Patients" — March 29, 2012

The Senate HELP Committee held this hearing to discuss the upcoming reauthorization of PDUFA and how FDA and its regulated industries can speed treatments and therapies to patients. Sara Radcliffe, Executive Vice President of Health, testified on behalf of BIO; she was joined by other industry representatives as well as Janet Woodcock (CDER) and Jeffrey Shuren (CDRH) from the FDA.

BIO'S EMERGING COMPANIES

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BIO Meetings and Conferences

BIO International Convention
June 18-21, 2012
Boston, Massachusetts

BIO India International Conference
September 12-13, 2012
Hyderabad, India

Livestock Biotech Summit
September 19-21, 2012
Kansas City, Missouri

BIO Investor Forum
October 9-10, 2012
San Francisco, California

BIO China
October 24-25, 2012
Shanghai, China

BIO Europe Fall
November 11-14, 2012
Hamburg, Germany

PRESIDENT OBAMA SIGNS SBIR REAUTHORIZATION

On December 31, 2011, President Obama signed into law the **National Defense Authorization Act**, which reauthorized the SBIR program through 2017. Included in the reauthorization was an end to the eligibility ban on venture-backed companies. Now, venture-backed companies will be able to compete for 25% of SBIR funds at NIH, NSF, and the Department of Energy and 15% of funds at all other agencies. Additionally, research agencies with SBIR programs will increase the set aside from 2.5% to 3.2% by 2017. BIO is in the process of reaching out to SBA, which will propose rules on affiliation in the upcoming months.

CONGRESS PASSES THE JOBS ACT

In late March, Congress passed the **Jumpstart Our Business Startups (JOBS) Act** to ease capital formation for growing startup companies. The legislation includes an "on-ramp" to the public market for "emerging growth companies," which will give them a five-year transition period before having to comply with certain regulatory burdens, including Sarbanes-Oxley (SOX) Section 404(b). The bill will also allow companies to conduct direct public offerings of up to $50 million under SEC Regulation A, eliminate the ban on general solicitation in Rule 506 of SEC Regulation D, and raise the shareholder limit that requires private companies to register with the SEC. The JOBS Act passed both houses of Congress with broad bipartisan support and President Obama has indicated that he will sign it into law.

BIO ADVOCATES FOR TDP EXTENSION AND EXPANSION

BIO has been advocating Congress for an extension and expansion of the Therapeutic Discovery Project (TDP) tax credit program. The TDP was enacted in 2010 and awarded $1 billion in tax credits and grants to breakthrough biotechnology companies with fewer than 250 employees. To support extension and expansion of this important program, BIO produced three video vignettes which give policymakers a view of what TDP has done for biotech companies already. The videos highlight companies that received awards through the program and emphasize the positive effect that the funding had on job creation, the development of treatments, and U.S. competitiveness. To view these videos, please click **here**, **here**, and **here**.

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