

Competition to Collaboration

No-Strings Deals Let Rivals Combine Unapproved Drugs

By Trista Morrison
Editor

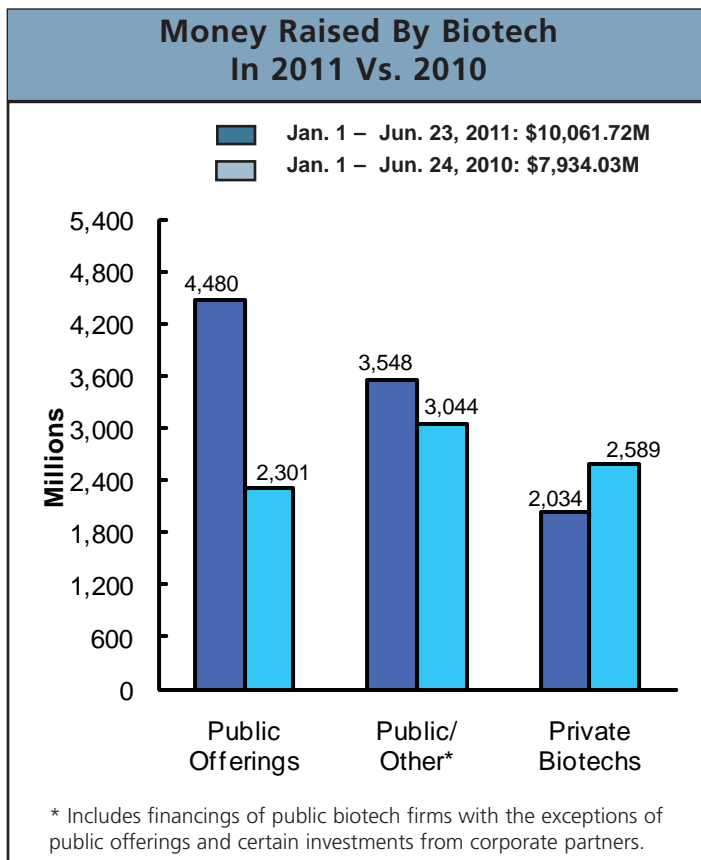
Science has taught us that many diseases – including HIV, HCV and cancer – can only be controlled by cocktails containing several drugs. Business has taught us that the best drugs don't necessarily come from your own pipeline, and they aren't always for sale. Hence the rise of no-money, no-rights, no-strings-attached deals to combine multiple unapproved drugs from multiple sponsors in a single clinical trial.

In years gone by, this business development model was "not the natural inclination of pharma or biotech," said Jeremy Levin, senior vice president of the strategic transactions group at Bristol-Myers Squibb Co. But what BMS terms the "clinical collaboration agreement," or CCA, is becoming an important "arrow in the quiver" for licensing execs, Levin said.

In the HCV space, Pharmasset Inc. and BMS recently started a Phase IIa trial that combines Pharmasset's nucleotide polymerase inhibitor PSI-7977 with BMS's NS5A inhibitor BMS-790052. Meanwhile, Anadys Pharmaceuticals Inc. is testing its non-nucleotide polymerase inhibitor setrobuvir (ANA598) with an undisclosed company's investigational antiviral.

Similar deals are cropping up in the cancer space. Earlier this month, BMS announced plans for a melanoma trial combining CTLA-4 inhibitor Yervoy (ipilimumab) with BRAF inhibitor vemurafenib, from Roche and Daiichi Sankyo Group subsidiary Plexxikon Inc. Although Yervoy was recently approved, the deal was in the works before the FDA blessed the drug. (See *BioWorld Today*, June 7, 2011.)

Conducting a clinical trial that combines an



investigational drug with an approved drug isn't new: Investigational cancer drugs are often combined with approved chemotherapies during clinical trials, and investigational antivirals are often layered on top of the standard of care.

But combining two investigational drugs is much more scientifically complex, from figuring out the dosing to

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*Specialists Spanning the Spectrum***Art of Spec Pharm Licensing:
Balancing Risk & Innovation****By Brian Orelli****BioWorld Insight Contributing Writer**

Last week, the specialty pharma industry saw activity at both ends of the innovation spectrum.

Pfizer Inc., which bought specialty pharma King Pharmaceuticals Inc., announced the approval of Oxecta. The drug, in-licensed from Acura Pharmaceuticals Inc., is a reformulation of oxycodone that discourages tampering associated with abuse. With a proven active ingredient, the development pathway for efficacy was low risk.

At the other end of the innovation spectrum, United Therapeutics Corp. licensed PLacental eXpanded (PLX) cell technology from Pluristem Ltd. The cardiovascular medicine specialist is taking a gamble on placenta-derived cells for treating pulmonary hypertension, albeit a relatively cheap one with just \$7 million in up-front licensing fees. (See *BioWorld Today*, June 21, 2011.)

By focusing on one therapeutic area, specialty pharma companies can use their expertise to gain access to drugs across the innovation spectrum.

"It's the depth of our experience and relationships in dermatology that bring us the lion's share of R&D opportunities in the therapeutic area," Jason Hanson, executive vice president and chief operating officer at Medicis Pharmaceutical Corp., told *BioWorld Insight*.

Diamonds in the Rough

Specializing doesn't necessarily result in blockbusters, but Rajesh Shrotriya, chairman, CEO and president at Spectrum Pharmaceuticals Inc., has a simple math equation to fix that. "I used to sit at Bristol-Myers and say, 'my god, if I could get my hands on drugs that are effective and safe and bring in only \$100 million a year in revenue, I could run a billion dollar business with 10 drugs on the market.'"

The types of licensing and acquisition deals specialty pharma companies go after is largely dependent on the

stage of the company. Smaller firms like Spectrum tend to go after smaller deals, while larger firms like Medicis can in-license specialty compounds with much bigger potential.

Spectrum currently sells two drugs, and they share something besides their size: Both are cast offs of other companies. "We've built the company basically on acquiring assets of other companies," said Spectrum's Shrotriya. "We added value because we knew what we were looking for, and we were able to see what others did not see."

Zevalin ([90Y]-ibritumomab tiuxetan) was purchased from Cell Therapeutics Inc., which licensed the radioimmunotherapy for non-Hodgkin's lymphoma from the original developer, Biogen Idec Inc. "We acquired the rights to this drug because we knew it was very effective, but nobody had sat down to see what they can do to bring this drug to the place it can belong," Shrotriya said. (See *BioWorld Today*, Feb. 24, 2009.)

Spectrum only paid \$33 million to license Zevalin and sold \$29 million worth of the product last year, nearly double the 2009 level. Shrotriya believes that removal of the requirement for a bioscan before the full dose is given, which is currently under review with the FDA, will further increase sales.

Fusilev (levoleucovorin) was similarly an underappreciated asset in its former home. Shrotriya said Spectrum was able to acquire the U.S. rights to the drug "for almost nothing" after an approvable letter sat at Wyeth Pharmaceuticals Inc. without any action. This year, Spectrum expects to exceed \$100 million in sales of Fusilev thanks, in part, to manufacturing issues for a related generic. (See *BioWorld Insight*, May 9, 2011.)

Proven Pathways

Oncology-focused specialty start-up Tesaro Inc. licensed two compounds in the last year after lining up \$20 million in its Series A financing round. In both instances, Tesaro took the safe route, focusing on compounds with proven targets. (See *BioWorld Today*, May 27, 2010.)

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Once More into the Breach

Genentech Not Alone with Blood-Brain Barrier Progress

By Anette Breindl
Science Editor

The blood-brain barrier, a 400-mile long protective layer that lines the blood vessels of the brain, prevents most proteins and chemicals, including 95 percent of drugs, from gaining access to gray matter. It is a fierce protector of health – and a constant headache for drug developers. So any successful attempt to get drugs across this barrier and into the brain marks what could be major progress for the neurology field.

Genentech Inc./Roche AG made a splash recently with its announcement that it had managed to get antibodies across the blood-brain barrier.

The company used an antibody with two binding sites. One of those was to a receptor, the transferrin receptor, which regularly shuttles iron across the blood-brain barrier in a process known as transcytosis. Targeting this receptor essentially allowed Genentech's antibody to hitch a ride. Once across the barrier, the antibody was guided by its other binding site for the popular Alzheimer's drug target beta-secretase. In two papers published in *Science Translational Medicine*, the Genentech team showed that their antibody, when injected into mice, did indeed cross the barrier and lowered the levels of amyloid beta in the brain once it had.

But Genentech is not the only firm making progress against the blood-brain barrier.

Montreal-based Angiochem Inc. is also working to harness transcytosis, but with what Angiochem CEO Jean-Paul Castaigne termed "a completely different approach" – one that may end up having broader utility than Genentech's.

"Their approach is unique and very clever," Castaigne told *BioWorld Insight*. But "our technology is a lot more flexible – it is easier to create a new molecule," he said. "Antibodies are more complicated."

Angiochem, Castaigne said, has identified the amino acid sequence that another transcytosis receptor, the LRPI receptor, uses to bind the proteins it ferries across the blood-brain barrier. It then identified a piece of that sequence that can be attached to different therapeutic molecules. Castaigne said the peptide could be attached to small molecules, protein drugs, and antibodies, and that his team has proof of concept for small molecules in humans, and for small molecules as well as protein and antibody drugs in animals.

The company is in the clinic with GRN1005, a cancer drug that is partnered with Geron Inc. GRN1005 has been in two separate clinical trials for people with brain metastases from solid tumors and patients with glioblastoma. Angiochem is also doing preclinical work evaluating transcytosis-delivered drugs for other cancers, pain and obesity.

Researchers from the University of California, San

Francisco recently reported another way to deal with the blood-brain barrier: let a metabolite do the dirty work. The researchers were able to forestall neurodegeneration by targeting the metabolism of the amino acid tryptophan in the blood. After treatment with the investigational compound JM6 (which is not yet in clinical trials, though its discoverers hope to have it there in 2013), tryptophan metabolites crossed the blood-brain-barrier and ultimately led to lower extracellular levels of the neurotransmitter glutamate. In mouse models, the drug improved the symptoms of both Alzheimer's and Huntington's disease.

Paul Muchowski, of the University of California at San Francisco, told *BioWorld Insight* that his team came to their approach more or less by accident: "originally, we were trying to develop compounds that have improved brain penetration." But during the course of his team's studies, they realized that it doesn't have to be the drug itself that crosses into the brain.

He said the idea of trying to have metabolites rather than the drugs themselves cross the blood-brain barrier is still rare, but "something that people are starting to look at more." His laboratory has identified additional compounds that work on the same general principle, as have others.

Muchowski noted that one drawback of compounds that act this way is that "for most of them, we don't have any real idea of what's going on," since the mechanism is so new. But, he added, using metabolites so that the drug itself can remain outside the blood-brain barrier has benefits.

First, he said, "you can get proof very easily" that the agent is working, because its primary effects are in the blood, which is certainly easier to sample than brain tissue.

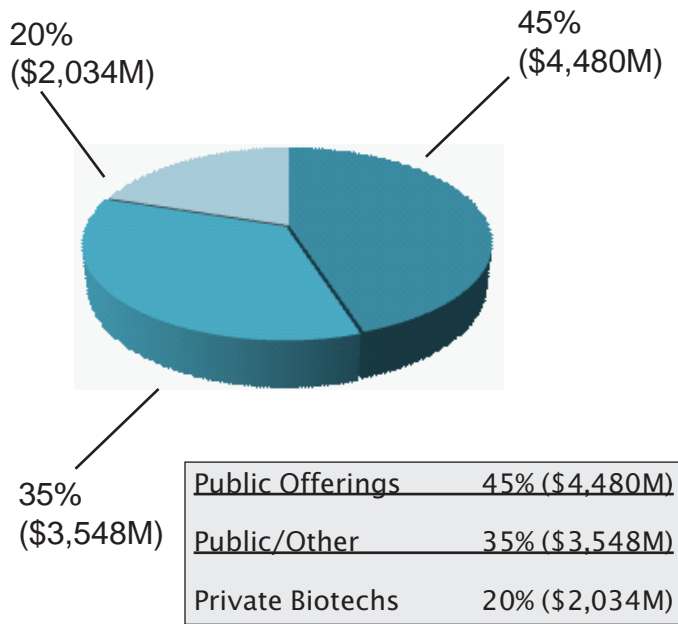
And second, "if you're not in the brain, you're avoiding the [central nervous system] side effects," Muchowski said. Such compounds still have off-target effects in the blood, of course, but that's to be expected of any drug and is often not as severe as off-target activity in the brain. ■

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inhibitor BMS-650032 and NS5A inhibitor BMS-790052, six of 11 patients broke through, but the others achieved a cure. Thus it was “very logical” for BMS to seek to combine its NS5A inhibitor with Pharmasset’s nucleotide polymerase inhibitor PSI-7977, which protects against viral breakthroughs, said Richard Smith, Pharmasset’s vice president of investor relations and corporate communications.

Smith noted that nucleotides are the backbone of HIV, HBV and herpes drug cocktails, and “we think they will be the backbone in HCV.” Pharmasset wants to prove it can combine its drugs “with any class of drugs out there” – but since it doesn’t have an NS5A inhibitor in its internal pipeline, teaming up with BMS was logical for the biotech as well.

In cancer, too, it is becoming increasingly clear that cocktails of drugs will be required to manage resistance mutations. At the American Society of Clinical Oncology annual meeting earlier this month, Yervoy investigator Jedd Wolchok said vemurafenib has spectacular, but seldom durable results, while Yervoy has a lower response rate, but relatively high rate of long-term success. The two drugs “complement each other nicely,” he noted.

Plexxikon president Kathleen Glaub said clinical investigators were “clamoring for a combination of vemurafenib and some immunotherapy” – such as Yervoy – because vemurafenib’s mechanism of action is thought to release antigen and prime the immune system. Thus when BMS approached Plexxikon and partner Roche about a combination trial, the seeds of scientific rationale had already been sown.

CCA

Continued from page 1

managing any safety signals. Combining two investigational drugs from two different companies adds a layer of business complexity, raising questions such as who will hold the investigational new drug (IND) application, who will take the lead on trial design and who will foot the bill.

“It’s risky for both parties,” said Sara Sandifer, analyst with Deloitte Recap LLC. Yet CCAs are definitely on the rise, indicating the risk comes with some significant rewards.

Science is the Driving Force

The original poster child indication for collaborations between drug companies was HIV. In order to help patients manage complex regimens of 15 to 20 pills that had to be taken at various times throughout the day and with various food requirements, BMS and Gilead Sciences Inc. teamed up to create once-daily Atripla (efavirenz/emtricitabine/tenofovir disoproxil fumarate). (See *BioWorld Today*, Dec. 21, 2004.)

But the components of Atripla were already FDA-approved and combined widely in clinical practice when BMS and Gilead formed their joint venture. In cancer and HCV, disease biology rather than convenience is the driving force, and companies are taking the lead by combining unapproved drugs rather than waiting for doctors to experiment with combinations of approved drugs.

In HCV, data indicate combinations of direct-acting antivirals (DAAs) might achieve high cure rates, if viral breakthroughs can be controlled. In a Phase II trial of protease

No Money? No Rights? No Problem.

But why not just license rights to the drug you want to combine with your own, or acquire the other drugmaker outright?

After all, when Vertex Pharmaceuticals Inc. wanted other antivirals to combine with its HCV drug Incivek (telaprevir), it paid \$377 million to acquire ViroChem Pharma Inc. and then licensed additional products from Alios BioPharma Inc. in a \$1.5 billion deal. (See *BioWorld Today*, March 5, 2009, and June 14, 2011.)

BMS’ Levin explained that a license means you want to develop that drug, you want to share the rights, you feel confident that you have the best possible combination. But in cancer and HCV, where the biology is still evolving and the drugs are still experimental, no one knows what the best combinations will be. It’s best to see where the science leads, and “you don’t have to own something” to explore that, Levin said.

Glaub added that “industry is getting more pragmatic. Over the past 10 years, there has been a greater recognition that not all good ideas come from your own R&D.” That realization has driven a huge increase in licensing and acquisitions, and CCAs are “just another aspect of that,” she said.

The stage of the companies involved is also a major factor.

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WEEK IN REVIEW

Financings

Achillion Pharmaceuticals Inc. raised \$56.6 million in a public stock offering.

AVEO Pharmaceuticals Inc. netted \$104.3 million in its previously announced public stock offering.

Cleveland BioLabs Inc. raised \$23.5 million through a registered direct offering.

Clovis Oncology Inc. filed for a \$149.5 million initial public offering.

GTx Inc. is raising \$47.5 million in a public stock offering.

Pharmacyclics Inc. raised \$57.1 million through a registered direct offering.

Tesaro Inc. raised \$101 million in Series B financing to advance its in-licensed cancer drugs.

Ultragenyx Pharmaceutical Inc. raised \$45 million in Series A funding for orphan diseases.

Deals

Allozyne Inc. went public via a reverse merger with **Poniard Pharmaceuticals Inc.**

Apeiron Biologics AG licensed rights to a Phase III anti-GD2 antibody for neuroblastoma from academia.

BioMarin Pharmaceutical Inc. paid \$48.5 million to **Pfizer Inc.** for a bulk biologics manufacturing plant.

Biotest AG licensed autoimmune drug BT-061 to **Abbott** in a \$480 million deal.

Syntarga BV and its antibody-drug conjugates were acquired by generics firm **Synthon BV**. (no terms)

United Therapeutics Corp. signed a \$62 million deal for **Pluristem Ltd.**'s placental cell technology.

... And More

Check out *BioWorld Today* for coverage from the International Conference on Malignant Lymphoma and the Annual Meeting of the Federation of Clinical Immunology Societies.

Acura Pharmaceuticals Inc. and **Pfizer Inc.** got FDA approval of pain drug Oxecta (oxycodone HCl).

Amylin Pharmaceuticals Inc., Alkermes Inc., and **Eli Lilly and Co.** got European approval of Bydureon (exenatide).

Celgene Corp.'s cutaneous T-cell lymphoma drug Istodax (rompsin) got FDA approval in peripheral T-cell lymphoma.

CMEA Capital launched Velocity Pharmaceutical Development, a virtual drug development company.

Fibrocell Science Inc. got FDA approval for wrinkle-reducer laViv (azficel-T).

LifeCycle Pharma A/S's kidney transplant drug LCP-Tacro got good Phase III results.

Merck Serono dropped development of oral multiple sclerosis drug cladribine.

Novartis AG's gout drug Ilaris (canakinumab) got a thumbs-down from an FDA advisory committee.

Regeneron Pharmaceuticals Inc.'s Eylea (aflibercept) for AMD got unanimous backing from an FDA advisory panel.

Roche AG and **Curis Inc.** reported good data from a pivotal Phase II trial of vismodegib in basal cell carcinoma.

Specialty Pharma

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First, Tesaro licensed the rights to rolapitant from OPKO Health Inc. The neurokinin-1 (NK-1) receptor antagonist, which is in development for chemotherapy-induced nausea, targets the same protein as Emend (aprepitant), sold by Merck & Co. Inc. (See *BioWorld Today*, Dec. 15, 2010.)

Rolapitant, originally developed by Schering-Plough Corp., was cast off by Merck to satisfy antitrust regulators. The founders at Tesaro had confidence that they could find value in the Phase-III ready compound, in part, because of their prior connection with MGI Pharma Inc., where they developed a nausea drug, Aloxi (palonosetron hydrochloride).

Tesaro's second deal involved the licensing of small-molecule inhibitors of anaplastic lymphoma kinase (ALK) from Amgen Inc. The deal was for preclinical compounds, but the risk was muted by the fact that ALK has been validated as a target in non-small cell lung cancer by Pfizer's crizotinib.

Mary Lynne Hedley, president, chief scientific officer and co-founder at Tesaro, said at this point Tesaro isn't "focused on brand-new, cutting-edge, never-been-tested-before science."

"Today, we're looking at, more, let's be best in class. Let's try to find the agent that we think that will make the best difference to patients in a pathway that is understood," said Hedley. Once the company has revenue coming in from the lower-risk compounds, Hedley said Tesaro will be in a better position to take on more technical risk.

Venture capitalists seem to like the strategy. Last week, the company raised \$101 million in a Series B financing round, which Tesaro plans to use to fund development of the current holdings as well as add two more compounds. (See *BioWorld Today*, June 22, 2011.)

Big Enough to Take a Swing

Like United Therapeutics, Medicis has reached a critical

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WORD ON THE STREET

"It's the special sauce."

– *Steve Worland, president and CEO of Anadys Pharmaceuticals Inc., on ribavirin's mysterious and often misunderstood role in HCV treatment*

"Partnering your first child doesn't mean you're going to partner every child."

– *Matthew Perry, managing director of Biotechnology Value Fund*

"It provided us with the confidence that you can work with other people."

– *Jeremy Levin, senior vice president of the strategic transactions group at Bristol-Myers Squibb Co., on how the pharma's experience developing combination products in the HIV space has helped it to be a leader in pioneering clinical collaboration agreements*

WEEK IN WASHINGTON

The House passed a bill that would give the FDA \$3.65 billion for its 2012 budget, \$710 million less than the president's proposal.

Under the proposed Medicare Drug Savings Act, H.R. 2190, biopharma companies with drugs covered by Medicare Part D would be required to pay the difference between the average rebates made to private Part D drug plans and 23.1 percent of the average manufacture price.

The Centers for Medicare & Medicaid Services decided not to issue a national coverage determination on erythropoiesis stimulating agents.

Specialty Pharma

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size where riskier preclinical deals make sense. Revenue at the dermatology specialist is approaching \$1 billion annually, and the company has plenty of cash, which Hanson believes gives it "the freedom to take some swings on some deals."

In February, the dermatology specialist agreed to pay Anacor Pharmaceuticals Inc. to discover boron-based small-molecule compounds to treat acne. At just \$7 million up front, Hanson said the early stage development program provides "an incredible value for the buck." (See *BioWorld Today*, Feb. 11, 2011.)

Medicis also has licensed a library of 200 compounds from an academic lab. The company is performing preclinical screening in partnership with CROs, and is in the process of exploring the option of setting up labs of its own.

Medicis isn't focused solely on early stage deals though. "We prioritize our business development platform such that we address any gaps in that strategy," Hanson said. And combining early stage, sometimes novel research with safer late-stage compounds and a suite of marketed products – all focused on a particular therapeutic area – has proven attractive to big pharma.

Pfizer's purchase of King Pharmaceuticals and Teva

Pharmaceutical Industries Ltd. purchase of Cephalon Inc. highlight the value that big pharma sees in a specialized companies. (See *BioWorld Today*, Oct. 13, 2010, and May 3, 2011.)

Despite the potential for an exit, specialty pharma firms generally don't put much thought into what a possible acquirer might think of a compound when setting up licensing deals.

Tesaro's Hedley said a potential future acquisition doesn't determine Tesaro's actions today. "Our focus is on building a business," Hedley said.

Dwelling on the possibility isn't productive for some companies. "For us – we've been around for almost a quarter century – it's not helpful to think about the possibility of being acquired on a day-to-day basis." Medicis' Hanson said.

Spectrum's Shrotriya pointed out that different acquirers might desire different things from an acquisition target. Catering to every potential need is impossible; the best a company can do is keep its options open. When Spectrum out-licensed its bladder cancer treatment, apaziquone, to Allergan Inc., it retained co-marketing rights in the U.S. despite not having a urology sales force. "We kept that option because somebody, who might be interested in us, might be interested in co-promoting our bladder cancer drug." ■

CCA

Continued from page 4

For a preclinical company like Alios, signing a partnership with Vertex brought in needed cash and removed a lot of risk. But for Pharmasset, which is well into Phase II studies and well financed, Smith said “why would we give up the rights?”

Meanwhile Plexxikon had already partnered vemurafenib with Roche, which is not exactly an easy acquisition target.

“There are many different ways of collaborating,” Levin told *BioWorld Insight*. “We’ve learned . . . you must focus on finding the best modality and craft the right kind of agreement. You can have an acquisition or a license or a CCA. We don’t walk in a priori with a concept, we are guided by what is the fastest way of doing things and . . . what delivers the most value to patients.”

Sandifer predicted the industry will develop different CCA structures based on the stage of the companies involved.

In the case of Pharmasset and BMS, Pharmasset manufactures its own drug, PSI-7977, and provides it to BMS. BMS manufactures its own drug, BMS-790052, and is responsible for running the trial and covering all trial costs. A joint steering committee designed the study and will review the data. There is no commitment from either party to do future studies.

Levin noted that for some companies, it is “very important to their image” to take the lead in the study, since only one company can hold the trial IND, even when there are two investigational drugs involved. “Different companies have different imperatives,” he added.

Uncharted Risks and Rewards

CCAs are “not easy to pull off – a lot of things need to come together,” Glaub said.

One of the biggest risks of combining two investigational drugs is the safety. “Safety is very important,” Smith said. “For us, the question is always finding a compound from a different class that has enough safety data to not put our compound at risk.” Pharmasset agreed to do a CCA with BMS in part because the pharma had a big safety database for BMS-790052.

The worst-case scenario would be if a safety signal in the combination trial resulted in a clinical hold for either or both of the individual drugs. That’s what happened to Idenix Pharmaceuticals Inc. when it combined two investigational HCV drugs from its own pipeline, IDX184 and IDX320, and saw elevated liver enzymes. Despite the fact that analysts remained confident in lead drug IDX184, Idenix’s stock fell 47 percent. (See *BioWorld Today*, Sept. 8, 2010.)

Another challenge of the CCA model is its novelty. Smith said not many other companies are willing to try these deals, since rights don’t change hands and big pharma often “wants more than just knowledge” at the end of the day.

Cost can also be a stumbling block. Glaub noted that each company “has its own portfolio and has allocated funds accordingly,” and opportunities presented by CCAs are not

factored in.

But on the flip side, CCAs can provide a cost savings over doing a combination study in which a single sponsor must pay for the cost of both drugs. And in the long run, if each drug was only effective as part of the combination, developing them together could offer a truncated clinical path compared to completing separate Phase III studies for each compound.

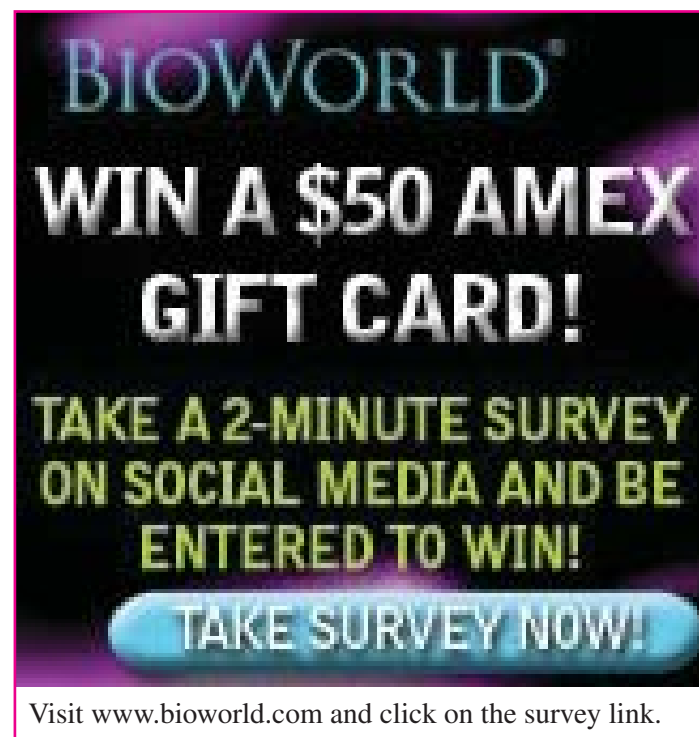
Above and beyond financial considerations, the biggest benefit of CCAs is that they provide an opportunity to “work with the best companies and the best medicines,” Levin said. The bottom line is figuring out if two drugs can work synergistically to tackle a disease. If that goal is met, Levin said, the makers of both components should benefit from an increased “likelihood doctors, patients and payers will use the medicines.”

Since CCAs are relatively new, it is not yet clear how drug makers will resolve issues related to commercialization. If the two drugs only work in combination, which company will file the new drug application? How will the combination be priced? Who will take the lead on sales?

But despite such uncertainties, everyone *BioWorld Insight* spoke to for this article was confident that CCAs will become more common in the future.

Sandifer noted that the FDA issued a guidance on combination studies last December that is “starting to lay the groundwork” for how such trials might play out along a regulatory path, although at this stage the agency said decisions will be made on a case-by-case basis.

There are a lot of unknowns, but that’s not a bad thing, in Sandifer’s opinion. “The industry and patients will benefit from uncharted territory,” she said. ■



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Top 10 Bio/Pharma Deals This Year

Companies	Month	Amount
AVEO Pharmaceuticals/Astellas	February	\$1.425B
Intra-Cellular Therapies/Takeda	March	\$750M
Epizyme/GlaxoSmithKline	January	\$650M
Theraclone Sciences/Pfizer	Januray	\$632M
Santaris Pharma/Pfizer	January	\$614M
Glenmark Pharma/Sanofi-Aventis	May	\$613M
AVEO/Centocor Ortho	June	\$555M
Zealand Pharma/Boehringer Ingelheim	June	\$537.3M
Biotest/Abbott	June	\$480M
Affectis/Merck Serono	June	\$407.5M

Collaborations Between Biotech And Pharmaceutical Companies: May 1 - June 23, 2011

TOTAL VALUE IN 2011: \$11,393.8M*

NUMBER OF DEALS IN 2011: 124

Company (Location)	Company (Location)	Value (M)	Type/Product Area	Terms/Details (Date)
MAY				
Agendia BV (Amsterdam, the Netherlands)	AstraZeneca plc (London)	ND	Partnership to accelerate the development of targeted therapies for colorectal cancer patients	Agendia will provide molecular data, bioinformatics support and diagnostic expertise; the companies are working with The Netherlands Cancer Institute (5/11)
Allos Therapeutics Inc. (Westminster, Colo.)	Mundipharma International Corp. Ltd. (Cambridge, UK)	\$360.5	Co-development and commercialization deal for ex-U.S. rights to Folutyn for peripheral T-cell lymphoma	Allos gets \$50M up front, up to \$310.5M in milestones, plus tiered, double-digit royalties; the companies will jointly fund further development costs (5/11)
ARCA biopharma Inc. (Broomfield, Colo.)	Novartis AG (Basel, Switzerland)	\$19.5	Agreement under which Novartis acquired global patent rights to an undisclosed molecular target	ARCA gets \$2M up front and a potential \$17.5M in milestones (5/4)
BioAlliance Pharma SA (Paris)	Sosei Group Corp. (Tokyo)	\$21.5	Licensing agreement for Japanese development and commercialization rights for BioAlliance's antifungal agent Loramyc	Sosei will pay BioAlliance \$3M up front and \$18.5M in milestones, as well as royalties (5/12)

Company (Location)	Company (Location)	Value (M)	Type/Product Area	Terms/Details (Date)
BioCritica Inc. (newly formed by Eli Lilly and Co. and investors Care Capital and NovaQuest Capital)	Eli Lilly and Co. (Indianapolis)	ND	Deal for rights to acquire several critical care compounds in preclinical development at Lilly	The collaboration includes a supply agreement, a services agreement and an option for BioCritica to gain rights to Xigris outside the U.S.; Lilly gets royalties on all future U.S. sales, as well as an equity stake in BioCritica (5/24)
Dyadic International Inc. (Jupiter, Fla.) and Engen Bio Inc. (Redwood City, Calif.)	Sanofi Pasteur (Lyon, France)	ND	Research agreement under which Sanofi will fund collaborative research at Dyadic Netherland's research and development facility in Wageningen, the Netherlands	The collaboration will utilize Dyadic's CI platform technology for certain vaccine applications (5/3)
ERYtech Pharma (Lyon, France)	Teva Pharmaceuticals Industries Ltd. (Jerusalem)	ND	Exclusive, long-term agreement for the registration, marketing, distribution and sale of Grasp, an enzyme formulation of L-asparaginase, in Israel	Teva agreed to pay milestone payments in addition to sharing profit on the basis of the purchase price agreed with Teva (5/18)
Glenmark Pharmaceuticals SA (subsidiary of Glenmark Pharmaceuticals Ltd.; Mumbai, India)	Sanofi-Aventis SA (Paris)	\$613	Licensing deal for monoclonal antibody GBR 500; exclusive marketing rights are for North America, Europe, Japan, Argentina, Chile and Uruguay	Glenmark and Sanofi will co-market products that come out of the deal in Russia, Brazil, Australia and New Zealand; Glenmark retains exclusive rights in India and the rest of the world, and will receive \$50M up front, plus milestone payments and double-digit royalties, for a total value of \$613M (5/17)
Heptares Therapeutics Ltd. (Welwyn Garden City, UK)	Shire plc (Dublin, Ireland)	ND	Exclusive option to license worldwide development and commercial rights to Heptares' adenosine A2A antagonist that is in preclinical development	Heptares received an upfront payment and is eligible to an option exercise payment, future milestone payments and royalties (5/10)
Paladin Labs Inc. (Montreal)	Takeda Pharmaceutical Co. Ltd. (Osaka, Japan)	ND	Exclusive rights agreement to develop and commercialize fomepizole (Antizol) to treat ethylene glycol and methanol poisonings in Japan	Paladin will receive an upfront payment and royalties based on sales in Japan (5/11)
TeaRx Ltd. (Moscow)	Roche AG (Basel, Switzerland)	ND	Partnership for the development and commercialization of a treatment for thrombosis	TeaRx will develop Factor Xa inhibitors provided by Roche for deep vein thrombosis and pulmonary embolism in surgical patients; the deal covers commercial rights in Russia and 12 other countries (5/31)

Company (Location)	Company (Location)	Value (M)	Type/Product Area	Terms/Details (Date)
JUNE				
Affectis Pharmaceuticals AG (Munich, Germany)	Merck Serono (division of Merck KgaA; Darmstadt, Germany)	\$407.5	Deal to develop neurology compounds targeting P2X7 receptors, a calcium channel thought to play a role in neuroprotection	The deal gives Merck worldwide rights to develop and commercialize the compounds in exchange for \$3.5M up front, plus research funding, with a potential \$404M in milestones, plus royalties (6/9)
Audion Therapeutics (Amsterdam, the Netherlands)	Sanofi-Aventis SA (Paris)	ND	Two-year research collaboration to develop potential treatments for hearing loss through the optimization of small molecules by using a regenerative medicine approach	Sanofi has an option to license technology rights from Audion (6/17)
AVEO Pharmaceuticals Inc. (Cambridge, Mass.)	Centocor Ortho Biotech Inc. (Horsham, Pa.; unit of Johnson & Johnson)	\$555	Exclusive worldwide development and commercialization deal to AVEO's preclinical antibodies targeting the RON receptor	Centocor paid \$15M up front, and will pay as much as \$540M in milestones, plus double-digit royalties on worldwide net sales (6/1)
Biotest AG (Dreieich, Germany)	Abbott (Abbott Park, Ill.)	\$480	Autoimmune disease deal focused on BT-061 for rheumatoid arthritis and psoriasis	Biotest gets \$85M up front and is eligible for \$395M in milestones, plus royalties on worldwide sales, except in Europe, where the companies will co-promote BT-061 (6/22)
Clovis Oncology Inc. (Boulder, Colo.)	Pfizer Inc. (New York)	\$255	Deal for the right to develop and commercialize PF-01367338, an inhibitor of Poly ADP-ribose polymerase inhibitor, which is in Phase I/II development for solid tumors	Clovis will pay an undisclosed up-front fee to Pfizer, plus potential milestones of \$255M; Pfizer Venture Investments will make an equity investment in Clovis (6/6)
Clovis Oncology Inc. (Boulder, Colo.)	Roche AG (Basel, Switzerland)	ND	Partnership to develop a PCR-based companion diagnostic test for epidermal growth factor receptor mutations in non-small-cell lung cancer	The test is being developed to support CO-1686, which targets the T790M mutant form of EGFR (6/3)
Cortex Pharmaceuticals Inc. (Irvine, Calif.)	Servier (Paris)	\$1	Agreement to sell rights to CX1632 to Servier for an up-front payment of \$1M	The companies will remain joint owners of related patents; in the event that Servier opts to acquire sole ownership of patent rights to CX1632, it will pay Cortex an additional \$2M (6/14)

Company (Location)	Company (Location)	Value (M)	Type/Product Area	Terms/Details (Date)
Hanwha Chemical Corp. (Seoul, South Korea)	Merck and Co. Inc. (Whitehouse Station, N.J.)	ND	Development and commercialization agreement for a biosimilar form of Enbrel	Merck made an undisclosed up-front payment to Hanwha, with possible additional milestone payments and tiered royalties on product sales (6/14)
Heptares Therapeutics Ltd. (Welwyn Garden City, UK)	AstraZeneca plc (London)	\$6.25	Four-year collaboration focused on discovery and development of new medicines for the treatment of central nervous system, metabolic and other diseases targeting G-protein coupled receptors	Heptares will receive an up-front \$6.25M cash payment plus committed research funding and potential milestone payments and royalties (6/1)
Neuralstem Inc. (Rockville, Md.)	Summit Pharmaceuticals International Corp. (Tokyo)	ND	Licensing agreement for its depression candidate, NSI-189	The agreement gives SPI the right to market development and licensing rights to the drug (6/8)
Unigene Laboratories Inc. (Boonton, N.J.)	China Pharmaceutical Group Ltd. (Hong Kong)	\$1.05	Deal to sell its 45% equity interest in Chinese joint venture Unigene Biotechnology Co. Ltd. to China Pharmaceutical Group or one of its affiliates for \$1.05M	All technology licenses, sub-licenses and other rights granted to the joint venture and China Pharmaceutical Group have been returned to Unigene; the venture was originally formed in June 2000 (6/14)
Zealand Pharma A/S (Copenhagen, Denmark)	Boehringer Ingelheim GmbH (Ingelheim, Germany)	\$537.3	Licensing agreement for exclusive global development and commercialization rights to its lead glucagon-GLP-1 dual agonist drug candidate, ZP2929 to treat Type II diabetes and obesity	Zealand could earn as much as \$537.3M in milestone and other payments, including \$57.76M during the first two years (6/17)

Notes:

The date indicated refers to the *BioWorld Today* issue in which the news item can be found.

* The total value represents the amount of disclosed money involving collaborations between biotechnology and pharmaceutical companies, including manufacturing, marketing and distribution agreements detailed in the following chart.

** Denotes the date the item ran in *BioWorld International*.

Manufacturing, Marketing And Distribution Agreements Between Biotech And Pharmaceutical Companies: May 1 - June 23, 2011

Company (Location)	Company (Location)	Value (M)	Type/Product Area	Terms/Details (Date)
MAY				
AstraZeneca plc (London)	Daiichi Sankyo Co. Ltd. (Tokyo)	ND	Co-promotion deal in Japan for denosumab to treat bone disorders stemming from bone metastasis	Daiichi Sankyo acquired rights to the RANK ligand inhibitor in 2007 from Amgen Inc., of Thousand Oaks, Calif., and filed a Japanese new drug application in August 2010 (5/25)
Prometheus Laboratories Inc. (San Diego)	Wilex AG (Munich, Germany)	\$39	Exclusive agreement for U.S. commercialization rights for Rencarex to treat nonmetastatic clear-cell renal cell cancer	Wilex will receive \$19M up-front and development fees plus milestone payments and royalties; Prometheus also will co-fund a portion of development, and Wilex may be granted rights outside the U.S. to one of Prometheus' marketed products or receive additional cash payments of up to \$20M (5/3)
JUNE				
D-Pharm Ltd. (Rehovot, Israel)	Jiangsu NHWA Pharmaceutical Co. Ltd. (China)	ND	Partnership to commercialize D-Pharm's DP-VPA therapy for Epilepsy in China	D-Pharm will receive up-front and developmental milestone payments, plus sales bonuses and royalties (6/1)
Ligand Pharmaceuticals Inc. (San Diego)	Merck & Co. Inc. (Whitehouse Station, N.J.)	ND	Captisol supply agreement for an undisclosed program	Ligand will supply clinical and commercial supplies of Captisol and, if the program is approved for commercialization, expects to deliver multiple metric tons annually (6/21)
Notes: The date indicated refers to the <i>BioWorld Today</i> issue in which the news item can be found. ** Denotes the date the item ran in <i>BioWorld International</i> .				

Biotech – Big Pharma Collaborations: Modified And Terminated Agreements, May 1 - June 23, 2011

Company (Location)	Company (Location)	Value (M)	Type/Product Area	Terms/Details (Date)
I. MODIFIED AGREEMENTS				
MAY				
NeuroSearch A/S (Copenhagen, Denmark)	Janssen Pharmaceutica NV (subsidiary of Johnson & Johnson)	ND	Extended collaboration, signed in 2009, until 2013	The companies are working together in the area of neuroscience (5/17)
Oxford BioMedica plc (Oxford, UK)	Pfizer Inc. (New York)	\$4	Expanded 5T4 tumor antigen licensing agreement, giving Pfizer nonexclusive rights for the diagnostic use of 5T4 antibodies and includes an option for commercialization of a 5T4-based diagnostic	The expansion adds another \$4M to the original \$24M agreement signed in 2001 (5/5)
Tekmira Pharmaceuticals Corp. (Vancouver, British Columbia)	Bristol-Myers Squibb Co. (New York)	ND	Expanded collaboration to include the evaluation of Tekmira's newly developed lipid nanoparticle formulations designed for delivery to tumors and other tissues outside the liver	BMS is using small interfering RNA molecules formulated by Tekmira to silence target genes (5/18)
Trimeris Inc. (Durham, N.C.)	F. Hoffmann-La Roche Ltd. (Basel, Switzerland)	\$4.9	Modified deal reaffirming Roche's exclusive license to manufacture and sell Fuzeon	Roche will pay Trimeris a royalty of 16% of worldwide net sales; the deal also releases each party from disputes related to previous agreements, and provides for a settlement by Roche of \$4.9M payable to Trimeris (5/31)
JUNE				
Dyax Corp. (Cambridge, Mass.)	Defiante Farmaceutica SA (affiliate of Sigma-Tau Group; Rome)	\$17	Expanded partnership for Kalbitor to treat hereditary angioedema and other indications to include development and commercialization rights in Latin America, excluding Mexico, and the Caribbean, Taiwan, Singapore and South Korea	Dyax will receive an up-front payment of \$7M and is eligible to receive as much as \$10M in milestones (6/1)

Company (Location)	Company (Location)	Value (M)	Type/Product Area	Terms/Details (Date)
pSivida Corp. (Watertown, Mass.)	Pfizer Inc. (New York)	\$2.3	Amended agreement to focus solely on a sustained-release implant for ocular hypertension and glaucoma	The product will deliver latanoprost using a system based on pSivida's Durasert technology; Pfizer will pay \$2.3M initially, and pSivida will develop it through Phase II trials; at that point, Pfizer can exercise an option for \$20M to develop and commercialize the product globally; pSivida would be eligible for milestone payments worth up to \$146.5M, plus double-digit royalties (6/16)

II. TERMINATED AGREEMENTS

MAY

BTG plc (London)	AstraZeneca plc (London)	ND	Terminated development and option agreement relating to CM-3, a glucagon-like peptide analogue in development for Type II diabetes and other indications	Had AstraZeneca exercised its option for CM-3, a \$25M milestone payment would have been owed to Biocompatibles shareholders (5/17)
Critical Outcome Technologies Inc. (London, Ontario)	Undisclosed pharmaceutical partner	ND	Suspended work related to development of small-molecule scaffolds for an HIV-1 integrase inhibitor program	The company will seek a new partner (5/9)
Evotec AG (Hamburg, Germany)	Roche AG (Basel, Switzerland)	\$300	Terminated deal to develop EVT 101 for treatment-resistant depression	The deal was terminated due to problems recruiting patients in a proof-of-concept study, plus the need to sharpen the toxicology profile and to provide an altered dosage (5/19)
Metabolex Inc. (Hayward, Calif.)	Sanofi-Aventis SA (Paris)	\$375	Terminated July 2010 license agreement for diabetes drug SAR260093/MBX-2982	The drug is a GPR119 receptor agonist (5/10)
Rigel Pharmaceuticals Inc. (South San Francisco)	Pfizer Inc. (New York)	ND	Terminated agreement for R343, an inhaled Syk inhibitor for allergic asthma	Pfizer opted to return full rights after its decision to exit the allergy and respiratory therapeutic R&D area (5/9)
Targacept Inc. (Winston-Salem, N.C.)	AstraZeneca plc (London)	ND	Terminated option deal after AstraZeneca decided to not exercise its option to license TC-5619	Targacept has all rights to the alpha7 neuronal nicotinic receptor modulator (5/3)

Company (Location)	Company (Location)	Value (M)	Type/Product Area	Terms/Details (Date)
JUNE				
Adolor Corp. (Exton, Pa.)	GlaxoSmithKline plc (London)	ND	Terminated deal for constipation drug Entereg	Adolor regains all rights three years after restrictive labeling and labor-intensive postmarketing requirements crushed hopes for a potential blockbuster (6/16)
Diamyd AB (Stockholm, Sweden)	Ortho-McNeil-Janssen Pharmaceuticals (subsidiary of Johnson & Johnson; New Brunswick, N.J.)	\$45	Terminated deal for license rights to diabetes therapy Diamyd	The decision to terminate came following disappointing data from a Phase III trial showing Diamyd failed to meet its primary endpoint in Type I diabetes; Diamyd received a nonrefundable \$45M payment when the deal was signed (6/2)
NovaBay Pharmaceuticals Inc. (Emeryville, Calif.)	Alcon Inc. (Huenenberg, Switzerland)	\$2.97	Terminated deal for worldwide rights to NovaBay's topical Aganocide compounds for antibiotic-resistant eye, ear and sinus infections	NovaBay is receiving a \$2.97M termination payment (6/17)

Notes:

The date indicated refers to the *BioWorld Today* issue in which the news item can be found.

** Denotes the date the item ran in *BioWorld International*.

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The Week's Biggest Gainers and Losers

10 BIGGEST U.S. WINNERS FOR THE WEEK

(By Percent)		(By Dollars)	
Lexicon	23.45	Biogen Idec	8.67
BG Medicine	23.04	Vertex Pharma	3.58
Cortex Pharma	22.22	Genomic Health	2.90
NovaBay	19.27	AVEO Pharma	2.60
SciClone Pharma	17.55	Acorda Therap	2.29
Achillion	16.80	AMAG Pharma	1.72
AVEO Pharma	15.34	InterMune	1.67
Anacor Pharma	15.24	Momenta Pharma	1.58
Ariad Pharma	14.06	Pacira Pharma	1.45
Unigene	13.83	BG Medicine	1.44

10 BIGGEST U.S. LOSERS FOR THE WEEK

(By Percent)		(By Dollars)	
Alseres	-50.00	Pain Therapeutics	-3.33
Labopharm	-42.31	Aegerion Pharma	-2.31
Pain Therapeutics	-38.54	Pharmasset	-1.49
Aryx	-33.33	Regeneron Pharma	-1.13
Generex Biotech	-26.32	Codexis	-0.97
DURECT	-23.66	Amgen	-0.97
Cardiovascular Bio	-21.88	DURECT	-0.66
CorMedix	-16.97	Exelixis	-0.61
Aegerion Pharma	-13.04	Auxilium Pharma	-0.52
Telik	-12.70	3S Bio	-0.50

BioWorld Stock Report For Public Biotechnology Companies

Company	Symbol	Close 6/17	Close 6/24	%Change		Vol (000)
				WK	YTD	
3S Bio	SSRX	15.64	15.14	-3.20	1.07	253
Aastrom Biosci	ASTM	2.51	2.67	6.37	4.30	1856
Acadia Pharma	ACAD	1.52	1.62	6.58	31.71	1013
Accentia Biopharma	ABPI	0.42	0.43	2.38	-42.67	387
Access Pharma	ACCP	1.79	1.75	-2.23	-28.57	119
AcelRx Pharma	ACRX	4.22	4.54	7.58	-0.22	49
Achillion	ACHN	6.19	7.23	16.80	78.08	18457
Acorda Therap	ACOR	30.52	32.81	7.50	19.27	2310
Adamis	ADMP	0.21	0.22	4.76	7.32	219
Adolor	ADLR	1.89	1.78	-5.82	43.55	1543
Aegerion Pharma	AEGR	17.72	15.41	-13.04	8.75	2558
AEterna Zentaris	AEZS	2.13	2.21	3.76	26.29	6503
Affymax	AFFY	6.67	6.96	4.35	4.66	3316
Affymetrix	AFFX	7.1	7.46	5.07	45.99	8627
Agenus	AGEN	0.78	0.77	-1.28	-23.76	1155
Albany Molecular	AMRI	4.86	4.76	-2.06	-19.05	583
Alexion Pharma	ALXN	44.61	44.82	0.47	-44.43	5102
Alexza Pharma	ALXA	1.54	1.65	7.14	30.95	8835
Alimera Sciences	ALIM	7.68	7.97	3.78	-21.94	1123
Alkermes	ALKS	16.61	17.31	4.21	40.73	4011
Allos Therapeutics	ALTH	2.01	2.1	4.48	-54.55	4018
Alnylam Pharma	ALNY	9.03	8.98	-0.55	-9.11	967
Alseres	ALSE	0.12	0.06	-50.00	-53.85	38
AMAG Pharma	AMAG	15.47	17.19	11.12	-5.39	884
Amarin	AMRN	13.69	14.44	5.48	74.19	12364
Amgen	AMGN	58.01	57.04	-1.67	2.72	27800
Amicus	FOLD	6.09	5.71	-6.24	19.21	1599
Ampliphi Biosci	APHB	0.22	0.23	4.55	-8.00	77
Amylin Pharma	AMLN	11.65	11.83	1.55	-20.55	9244
Anacor Pharma	ANAC	5.97	6.88	15.24	28.12	465
Anthera Pharma	ANTH	7.95	8.11	2.01	66.53	1862
Ardea Biosciences	RDEA	24.5	24.72	0.90	-5.94	639
Arena Pharma	ARNA	1.4	1.31	-6.43	-23.39	6710
Ariad Pharma	ARIA	9.32	10.63	14.06	105.21	19808
ArQule	ARQL	6.59	6.45	-2.12	11.40	1372
Array BioPharma	ARRY	2.14	2.15	0.47	-27.85	1869
Aryx	ARYX	0.03	0.02	-33.33	-92.59	209
Auxilium Pharma	AUXL	19.64	19.12	-2.65	-9.85	3780
Avanir	AVNR	3.65	3.46	-5.21	-13.72	17565
Avax Tech	AVXT	0.03	0.03	0.00	-33.33	250
AVEO Pharma	AVEO	16.95	19.55	15.34	32.99	3694
AVI BioPharma	AVII	1.39	1.4	0.72	-35.19	4243
Bellus Health	BLUS	0.06	0.06	0.00	-61.29	152
BG Medicine	BGMD	6.25	7.69	23.04	-7.35	226
BioCryst Pharma	BCRX	4	3.84	-4.00	-25.15	1054
Biodel	BIOD	1.72	1.81	5.23	-5.73	3831
Biodelivery Sci	BDSI	3.52	3.47	-1.42	-6.22	198
Biogen Idec	BIIB	94.75	103.42	9.15	54.82	23669
BioMarin Pharma	BMRN	25.66	25.55	-0.43	-5.96	3532
Bio-path Holdings	BPTH	0.33	0.33	0.00	-8.33	117
BioSante Pharma	BPAX	2.52	2.8	11.11	68.67	8371
Cadence Pharma	CADX	8.86	9.28	4.74	23.08	2193
Cardiome	CRME	4.02	3.93	-2.24	-40.00	778
Cardiovascular Bio	CVBT	0.32	0.25	-21.88	-26.47	1283
Catalyst Pharma	CPRX	1.81	1.85	2.21	92.71	701
Celgene	CELG	57.87	58.77	1.56	-1.11	13420
Cell Therapeutics	CTICD	2.02	1.99	-1.49	434.95	22972

Company	Symbol	Close 6/17	Close 6/24	%Change		Vol (000)
				WK	YTD	
Celldex Therap	CLDX	3.16	3.58	13.29	-14.15	2384
CEL-SCI	CVM	0.52	0.5	-3.85	-39.93	3315
Cephalon	CEPH	79.71	79.89	0.23	28.52	7572
Cerus	CERS	2.75	3	9.09	20.97	1622
Chelsea Therap	CHTP	4.99	5.12	2.61	-32.54	5349
Cleveland Biolabs	CBLI	3.59	3.39	-5.57	-52.85	4897
Codexis	CDXS	10.48	9.51	-9.26	-10.28	1958
Columbia Labs	CBRX	3.2	3.23	0.94	47.49	10582
CombiMatrix	CBMX	3.52	3.42	-2.84	53.36	23
Complete Genomics	GNOM	15.19	15.23	0.26	103.88	1627
Compugen	CGEN	3.91	4.09	4.60	-17.87	326
Corcept	CORT	4.44	4.62	4.05	17.86	1982
CorMedix	CRMD	1.65	1.37	-16.97	-22.16	59
Cornerstone Therap	CRTX	7.95	7.88	-0.88	39.47	361
Cortex Pharma	CORX	0.09	0.11	22.22	-38.89	117
Cubist Pharma	CBST	34.96	35.71	2.15	65.48	4598
Curis	CRIS	3.21	3.58	11.53	77.23	2695
Cytokinetics	CYTK	1.15	1.22	6.09	-41.63	7413
CytRx	CYTR	0.78	0.74	-5.13	-26.00	12472
Dara Biosciences	DARA	2.67	2.64	-1.12	-21.66	178
Dendreon	DNDN	38.13	38.65	1.36	9.15	8352
DepoMed	DEPO	7.86	8.1	3.05	25.00	4451
DiaDexus	DDXS	0.31	0.31	0.00	6.90	22
Discovery Labs	DSCO	1.98	2.17	9.60	-34.83	1184
DURECT	DRRX	2.79	2.13	-23.66	-40.00	7212
Dusa Pharma	DUSA	5.71	5.93	3.85	141.06	4354
Dyax	DYAX	2.06	2.13	3.40	1.91	2167
Dynavax	DVAX	2.58	2.73	5.81	-11.94	10799
Emergent BioSol	EBS	21.88	21.91	0.14	-7.47	1272
Emisphere Tech	EMIS	1.15	1.03	-10.43	-56.54	210
Endocyte	ECYT	11.93	12.88	7.96	66.62	1312
Entremed	ENMD	3.11	2.86	-8.04	-43.70	241
Enzo Biochem	ENZ	3.75	3.89	3.73	-28.36	1433
Enzon Pharma	ENZN	9.97	10.01	0.40	-17.95	2083
Epicept	EPCT	0.5	0.42	-16.00	-50.59	340
Exelixis	EXEL	9.35	8.74	-6.52	1.75	6095
Flamel Tech	FLML	5.42	5.05	-6.83	-27.44	146
Forest Labs	FRX	38.68	39.33	1.68	23.02	17424
Generex Biotech	GNBT	0.19	0.14	-26.32	-52.53	5133
Genomic Health	GHDX	25.47	28.37	11.39	29.66	1031
GenVec	GNVC	2.87	3.18	10.80	457.89	1410
Geron	GERN	3.86	3.92	1.55	-24.76	7395
Gilead Sciences	GILD	39.53	39.71	0.46	9.51	29564
GTx	GTXI	5.25	4.77	-9.14	72.83	6971
Harbor Biosci	HRBR	0.2	0.18	-10.00	38.46	67
Harvard Bio	HBIO	5.15	5.17	0.39	27.34	2977
Human Genome	HGSI	25.15	24.91	-0.95	2.93	9670
Idenix Pharma	IDIX	5.15	5.25	1.94	5.21	2742
Idera Pharma	IDRA	2.25	2.19	-2.67	-24.48	43
Immucor	BLUD	19.58	19.37	-1.07	-3.34	2831
ImmunoGen	IMGN	11.72	11.64	-0.68	23.57	2260
Immunomedics	IMMU	3.78	3.82	1.06	6.11	2156
Incyte	INCY	17.93	18.37	2.45	9.54	12519
Infinity Pharma	INFI	7.14	7.92	10.92	30.91	691
Inhibitex	INHX	3.72	3.93	5.65	46.10	2246
InterMune	ITMN	33.35	35.02	5.01	-5.12	3902
Ironwood Pharma	IRWD	15.81	16.03	1.39	54.88	5488

Company	Symbol	Close 6/17	Close 6/24	%Change WK	%Change YTD	Vol (000)
ISIS Pharma	ISIS	8.72	8.93	2.41	-12.02	3253
Keryx Biopharma	KERX	4.32	4.62	6.94	-1.07	5590
Labopharm	DDSS	0.26	0.15	-42.31	-84.21	5659
Lexicon	LXRX	1.45	1.79	23.45	20.13	9829
Ligand Pharma	LGND	10.27	11	7.11	23.46	881
MannKind	MNKD	3.89	3.99	2.57	-50.92	4049
Map Pharma	MAPP	15.36	15.61	1.63	-6.30	1015
Maxygen	MAXY	5.4	5.27	-2.41	33.76	933
MDRnA	MRNA	0.26	0.25	-3.85	-83.65	2848
Metabolix Inc.	MBLX	6.9	6.95	0.72	-41.60	1003
Micromet	MITI	5.28	5.52	4.55	-33.25	2622
Momenta Pharma	MNTA	17.75	19.33	8.90	28.70	3296
Myrexix	MYRX	3.68	3.61	-1.90	-15.06	460
Myriad Genetics	MYGN	22.7	22.52	-0.79	-1.79	4341
Nabi Biopharma	NABI	4.88	5.06	3.69	-13.50	1730
Nanogen	NGEN	0.01	0.01	0.00	17.65	58
Nektar Therap	NKTR	7.65	7.4	-3.27	-42.90	3541
NeoPharma	NEOL	0.31	0.31	0.00	6.90	177
Neurocrine Biosci	NBIX	7.28	7.53	3.43	-2.08	1157
NeurogesX	NGSX	2.07	1.98	-4.35	-68.67	1821
NovaBay	NBY	1.09	1.3	19.27	-22.16	1327
Novavax	NVAX	2	1.97	-1.50	-22.75	4472
NPS Pharma	NPSP	9.23	9.25	0.22	15.34	3794
NuPathe	PATH	6.88	7.46	8.43	-17.66	697
Omeros	OMER	4.01	4.5	12.22	-46.17	2099
OncoGenex Pharma	OGXI	16.34	17.48	6.98	6.26	1134
Oncothyreon	ONTY	8.1	8.95	10.49	173.70	20853
Onyx Pharma	ONXX	34.95	34.89	-0.17	-5.58	2361
Opko Health	OPK	3.29	3.45	4.86	-7.01	6629
Optimer Pharma	OPTR	12.51	12.02	-3.92	4.52	3335
OraSure Tech	OSUR	8.17	8.16	-0.12	36.68	992
Ore Pharma	ORXE	0.25	0.25	0.00	1.63	0
Orexigen	OREX	1.6	1.71	6.87	-79.04	3934
Osiris Thera	OSIR	6.75	7.6	12.59	-4.28	522
Oxis International	OXIS	0.09	0.09	0.00	-33.33	117
Pacific Biosciences	PACB	11.27	11.32	0.44	-28.85	3354
Pacira Pharma	PCRX	10.55	12	13.74	70.94	809
Pain Therapeutics	PTIE	8.64	5.31	-38.54	-20.63	11970
Palatin Tech	PTN	0.88	0.82	-6.82	-36.43	446
Panacos Pharma	PANC	0.01	0.01	0.00	0.00	52
Peregrine Pharma	PPHM	1.85	1.8	-2.70	-18.18	1601
Pharma Prdt Dev	PPDI	25.69	26.14	1.75	-4.98	4534
Pharmacyclics	PCYC	9.26	10.11	9.18	62.02	4825
Pharmasset	VRUS	108.47	106.98	-1.37	143.47	4271
Pharmos	PARS	0.1	0.11	10.00	10.00	19
Poniard Pharma	PARD	0.23	0.23	0.00	-60.34	1272
Pozen	POZN	4.5	4.33	-3.78	-34.09	537
Progenics Pharma	PGNX	7.01	6.93	-1.14	28.10	867
Protalix Biothera	PLX	6.25	6.2	-0.80	-37.88	503
Protein Design	PDLI	5.81	5.75	-1.03	-7.56	11905
Qiagen	QGEN	19.1	18.78	-1.68	-3.44	30850
QLT Inc.	QLTI	6.75	7.03	4.15	-1.82	958
Raptor Pharma	RPTP	6.47	6.32	-2.32	73.63	6085
Regeneron Pharma	REGN	54.02	52.89	-2.09	58.45	5390
Repligen	RGEN	3.56	3.55	-0.28	-24.90	1334
Rexahn Pharma	RNN	1.25	1.24	-0.80	7.83	4778
Rigel Pharma	RIGL	8.13	8.36	2.83	10.00	3266
Rosetta Genomics	ROSG	0.29	0.33	13.79	-65.26	666
Rxi Pharma	RXII	0.98	1.01	3.06	-61.74	2291
Sagent Pharma	SGNT	27.08	26.94	-0.52	40.39	1312
Sangamo Biosci	SGMO	5.62	6.02	7.12	-12.24	1984
Santarus	SNTS	3.19	3.19	0.00	-3.04	810
Savient Pharma	SVNT	6.91	6.74	-2.46	-39.98	10390
SciClone Pharma	SCLN	5.07	5.96	17.55	40.57	3081
Seattle Genetics	SGEN	19.5	20.7	6.15	34.94	7357
Sequenom	SQNM	7.32	7.25	-0.96	-10.93	5676
SIGA Tech	SIGA	10.74	10.8	0.56	-22.64	2526
Somaxon Pharma	SOMX	2.13	2.09	-1.88	-34.89	4918
Spectrum Pharma	SPPI	8	8.45	-3.98	19.35	6767
StemCells	STEM	0.55	0.54	-1.82	-51.35	14523
Sucampo Pharma	SCMP	4.2	4.22	0.48	10.18	277
SuperGen	SUPG	2.9	2.9	0.00	9.85	2996
Synta Pharma	SNTA	4.47	4.79	7.16	-21.73	1159
Talon Thera	TLON	0.97	1.04	7.22	116.67	1964
Targacept	TRGT	21.37	21.21	-0.75	-20.53	664
Telik	TELK	0.63	0.55	-12.70	-31.68	361
Tengion	TNGN	1.34	1.35	0.75	-50.73	358
Theravance	THRX	21.18	21.24	0.28	-16.87	2045
Titan Pharma	TTNP	1.69	1.57	-7.10	28.69	1548
Transcept Pharma	TSPT	10.14	10.44	2.96	38.28	508
Transgenomic	TBIO	1.58	1.55	-1.90	118.31	193
Tranzyme	TZYM	4.2	4.04	-3.81	1.00	44
Trimeris	TRMS	2.55	2.43	-4.71	-0.41	136
Trinity Biotech	TRIB	9.93	9.96	0.30	12.67	190

Company	Symbol	Close 6/17	Close 6/24	%Change WK	%Change YTD	Vol (000)
Trius Therap	TSRX	7.61	7.44	-2.23	105.81	794
Unigene	UGNE	0.94	1.07	13.83	59.70	81
United Therap	UTHR	54.39	54.06	-0.61	-14.64	6264
Vanda Pharma	VNDA	7.05	6.99	-0.85	-25.48	486
Ventrus Biosciences	VTUS	14.3	15.25	6.64	130.36	207
Vermillion	VRML	4.03	3.91	-2.98	-47.30	805
Vertex Pharma	VRTX	45.01	48.59	7.95	37.49	11739
Vical	VICL	3.94	4.03	2.28	96.59	4475
ViroPharma	VPHM	17.28	17.71	2.49	0.62	2765
Vivus	VVUS	7.67	7.61	-0.78	-20.15	5631
XenoPort	XNPT	7.05	6.74	-4.40	-22.17	2008
Zalicus Inc	ZLCS	2.18	2.42	11.01	48.47	7813
Zogenix	ZGNX	3.77	4	6.10	-29.45	569

LONDON STOCK EXCHANGE

Company	Symbol	6/17	6/24	%WK	%YTD	Volume
Antisoma	ASM	2.5	2.8	12.00	-91.52	5782
Ark Therapeutics	AKT	3.555	3.45	-2.95	-75.44	846
Asterand	ATD	11.55	10.55	-8.66	-43.28	64
Oxford Biomedica	OXB	5.4	5.5	1.85	-51.11	6380
Phytopharm	PYM	7.9	7.9	0.00	-27.12	4281
Puricore	PURI	36	35.15	-2.36	162.31	121
Renovo Group	RNVO	14	14	0.00	-51.56	3726
SkyePharma	SKP	44	40.55	-7.84	-52.83	8
Vernalis plc	VER	39.625	39.625	-0.09	-54.45	6

Note: Prices are denoted in pence.

TORONTO STOCK EXCHANGE

Company	Symbol	6/17	6/24	%WK	%YTD	Volume
Adherex Technol	AHX	0.03	0.03	0.00	-33.33	61
Allon Therapeutics	NPC	0.37	0.37	0.00	15.63	90
BELLUS Health	BLU	0.06	0.06	0.00	-66.67	1675
Bioniche Life Sci	BNC	0.98	0.87	-11.22	55.36	378
Cangene	CNJ	1.65	1.63	-1.21	-68.04	115
Isotechnika	ISA	0.21	0.18	-14.29	9.09	259
Lorus Therap	LOR	0.63	0.49	-22.22	653.85	61
Medicago	MDG	0.47	0.47	0.00	-29.85	0
MethylGene	MYG	0.39	0.38	-2.56	35.71	239
Oncolytics Biotech	ONC	5.24	5.17	-1.34	88.00	413
Protox Therap	PRX	0.53	0.52	-1.89	-38.82	344
Resverlogix	RVX	1.55	1.52	-1.94	-37.19	289
SemBioSys Gen	SBS	0.09	0.07	-22.22	-65.00	12
Tekmira Pharma	TKM	2.6	2.46	-5.38	164.52	47
Thallion Pharma	TLN	0.17	0.17	0.00	54.55	371
Theratechnologies	TH	4.52	4.27	-5.53	-3.61	369
Wex Pharma	WXI	0.15	0.15	0.00	-9.09	0
YM BioSciences	YM	2.38	2.63	10.50	81.38	161

Note: Prices are denoted in Canadian dollars.

HOLIDAY NOTICE:

Next week's *BioWorld Insight* will arrive on Tuesday, July 5, due to the Independence Day holiday.

NOTES:

Trading volumes for Nasdaq, Amex and NYSE are recorded as the total number of shares traded (in thousands) on a weekly basis (cumulative Monday through Friday); the weekly and YTD % changes are from IPO completion, where applicable.

Average Percent Change Week: +0.83%

Range: -50.00% to +23.45%; Number Of Companies: 211 (does not include LSE or TSX; not market weighted)

Average Percent Change YTD: +7.58%

Range: -92.59% to +457.89%; Number Of Companies: 211 (does not include LSE or TSX; not market weighted)