THE BURRILL REPORT

Vol. 2, Issue 9

September 2012

IN THIS ISSUE

Focus on:
Personalized Medicine

Partnering Dollars Decline for Biotechs

Competition for Pharma deals squeezes critical source of funding

The $3.4 billion partnering agreement announced in July between Bristol-Myers Squibb and AstraZeneca to share Amylin profits points to a troubling trend in partnering deals for new drugs, diagnostics, and tools in development. Once a reliable source of funding for development activities, biotech companies are facing increasing competition for partnering dollars at a time when there's a shrinking pool of spending.

This year, partnering deals for therapeutics, diagnostics, and tools companies during the first seven months totaled $19.6 billion, below the $22.8 billion for the same period a year ago. The decline continues a multiyear slide for partnering activity since at least 2009. Were partnering activity to continue at its current pace, it would total $32.3 billion this year, compared to $52.8 billion in 2009.

Month In Review

Growing competition with academics and non-profits, reorganized pipelines, and financial pressures on Big Pharma budgets are squeezing the partnering dollars going to biotechs. The difficult financing environment is leaving biotechs in a weak position at the negotiating table.

Partnering activity has also become increasingly concentrated. The top ten deals accounted for more than half of the $19.6 billion in transactions so far this year, with the top deal—between Bristol-Myers and AstraZeneca—not involving biotechs at all. In addition, a pickup in pharmaceutical partnerships with academic and non-profit institutions—more than a dozen were announced in July—is drawing funding and

(continued on page 4) »

A Glimpse of the Future

Stanford researcher's work offers vision of personalized healthcare

BY DANIEL S. LEVINE

Michael Snyder envisions one day rolling out of bed, brushing his teeth, and sticking his finger for a blood sample that analyzes perhaps thousands of measures to monitor his health and warn of developing disease. Though this may sound like a long-standing personalized medicine fantasy, the difference is that Snyder has, in a sense, already lived it.

Snyder, a professor of genetics at Stanford University and the director of the Stanford Center for Genomics and Personalized Medicine, has gotten to know himself better than most people. Since arriving at Stanford in the summer of 2009, he's been the center of his own personalized medicine project that began with sequencing his entire genome and has since routinely drawn blood to measure the changes in 40,000 variables including RNA, proteins, metabolites, and antibodies the body produces against itself known as autoan-

(continued on next page) »

July 2012 Life Sciences Scorecard (USD M)

	2012*	2011*	% Change		2012*	2011*	% Change
Global Venture Capital	**7,214**	**5,809**	**24.2**	**Global Debt Offerings**	**14,037**	**29,004**	**-51.6**
U.S. VC	5,410	4,355	24.2	U.S. Debt	9,734	15,484	-37.1
IPOs (21 in 2012 v. 35 in 2011)	**1,511**	**3,241**	**-53.4**	**Global Other Debt**	**12,481**	**9,119**	**36.9**
U.S. IPOs (11 in 2012 v. 13 in 2011)	771	1,111	-30.6	U.S. Other Debt	11,056	3,511	214.9
Global PIPEs	**3,696**	**2,400**	**54.0**	**Total Global Public Financings**	**37,434**	**51,919**	**-27.9**
U.S. PIPEs	947	1,052	-10.0	Total U.S. Public Financings	27,601	25,406	8.6
Global Follow-ons*	**4,664**	**7,673**	**-39.2**	**Global Partnering**	**19,585**	**22,825**	**-14.2**
U.S. Follow-ons*	4,165	4,051	2.8	U.S. Partner/Licenser	12,130	14,478	-16.2
Global Other Equity	**1,045**	**482**	**116.9**	**Global M&A**	**78,191**	**126,311**	**-38.1**
U.S. Other Equity	928	198	369.9	M&A, U.S. Target	57,296	67,752	-15.4

2012 numbers reflect the addition of $462M raised by Alexion in May, not previously included in these numbers.
*YTD July 31

THE BURRILL REPORT

PUBLISHER
G. Steven Burrill

EDITOR
Daniel S. Levine

MANAGING EDITOR
Marie Daghlian

ASSOCIATE EDITOR
Michael Fitzhugh

RESEARCHER
Vinay Singh

GRAPHIC DESIGNERS
Carol Collier
Deven Cao

SALES
Nicole Boice
(949) 680-7088
nboice@b-c.com

Bryan Plescia
(415) 591-5471
bplescia@b-c.com

ISSN:1943-7617

PUBLISHED MONTHLY BY:

BURRILL & COMPANY

ONE EMBARCADERO CENTER

SUITE 2700

SAN FRANCISCO, CA 94111

T: 415-591-5400

EMAIL: dlevine@b-c.com

Glimpse of the Future

(continued from previous page)

tibodies.

The data forms what Snyder has dubbed an integrative Personal Omics Profile, or iPOP. When he is ill, he does additional blood draws for analysis. In all, with about 43 samples taken so far, the data Snyder's team has accumulated on the physiological changes in his body includes billions of data points requiring nearly 100 terabytes of storage, equivalent to nearly 102,400 gigabytes.

To Snyder's surprise, his whole genome scan revealed an elevated risk for diabetes. Snyder was not aware of any family history of the disease and as someone with a medium build hadn't considered himself at risk. However, he and his team watched the disease develop at a molecular level following a viral infection. He and his team believe the stress response to the virus triggered the onset of his type 2 diabetes.

Normally, he has said he would get a physical every two to three years so the disease could have gone undetected for some time, but Snyder says by catching the disease as it developed, he was able through diet and exercise to reverse it and restore his blood sugar to normal levels. Although he now forgoes deserts, he says he doesn't really miss them except for ice cream.

Though such an approach may not yet be ready for prime time because of the challenges of managing the massive amounts of data generated, the 50 to 60 milliliters of blood required for each draw, and the expense of conducting the various tests, Snyder and his team believe it's a proof of principal of the transformational power of personalized medicine. He believes the number of variables monitored, the amount of blood required, and the cost of testing can all be reduced to a level appropriate as part of a regular doctor's office visit or, his hope, a consumer self-test.

"When you go to a doctor's office and they draw blood they measure 15 different things," he says. "We knew from the work we were doing that you could measure thousands if not tens of thousands of components in blood. That should give you a much better picture of what's going on for measuring healthy and disease states."

Using the integrated Personal Omics Profile, Snyder says the changes of various biological pathways could be seen at a level no one has ever seen before by measuring this many different things. While it's a great way to see when something goes wrong, the challenge now is to determine which of those measures are most valuable to monitor as robust indicators of health and disease.

"The name of the game for healthcare is, if you can catch diseases early, you can usually correct them, as occurred in my case," says Snyder. "If you catch them late, whether its cancer or anything else, it's very difficult to reverse the symptoms or the problems."

Snyder is now embarking on an expanded study by enrolling people who are at risk for type 2 diabetes and following them for five years, a period of time that should see about a third of them develop the disease. Snyder hopes to see the triggers of the onset of the disease as well as the molecular changes that occur.

But he believes we are moving to a standard of care where patients will routinely have their whole genome scanned to identify their risks for disease and use detailed monitoring on thousands of measures to indicate the changing status of their health.

As for his own blood draws and analysis, Snyder has no plans to stop.

"I plan to do it all the way until I die. I guess that's the endpoint. If I die of something acute and fast, it will probably be the person after me who will figure out what markers are associated with that. If it's a slow, chronic thing, perhaps I'll figure it out, what some of those markers might be." ■

"The name of the game for healthcare is, if you can catch diseases early, you can usually correct them... If you catch them late, whether its cancer or anything else, it's very difficult to reverse the symptoms or the problems."

Michael Snyder

Professor of genetics at Stanford University and the director of the Stanford Center for Genomics and Personalized Medicine

Piecing Big Data Together

GNS Healthcare helps researchers and insurers model disease and test treatments.

BY MICHAEL FITZHUGH

When Colin Hill got his first computer, it was a Commodore VIC-20, which came packed with state of the art 5K or RAM. Today, though, Hill and his colleagues at GNS Healthcare guide medical treatments and drug discovery with powerful supercomputers. Their work exemplifies how the emerging area of health data analytics is reshaping drug development and clinical decision making.

"For a large part of medical practice, we don't know what works. But we pay for it anyway."

H. Gilbert Welch

Professor of medicine, Dartmouth Institute for Health Policy and Clinical Practice, writing in a *New York Times* op-ed piece

By applying artificial intelligence and increasingly sophisticated software algorithms, modern health data analytics companies like GNS are using integrated data sources, such as electronic health records and genomics data, to move beyond historical, retrospective reporting toward real-time, predictive analysis. It's an approach that is driving healthcare into a future in which data analytics will be utilized at every point of care, predicts the consultancy Frost & Sullivan.

"The truth is that for a large part of medical practice, we don't know what works. But we pay for it anyway," wrote H. Gilbert Welch, a professor of medicine at the Dartmouth Institute for Health Policy and Clinical Practice, in a recent op-ed for *The New York Times*. With per capital annual health expenditures climbing past $8,000, he writes, we should learn which practices work and which don't.

GNS, based in Cambridge, Massachusetts, is applying industrial-scale data analytics to explore that question. Drawing from the vast and growing "data exhaust" of the healthcare system, the company is building what Hill calls a sort of "always on clinical trial where we're always learning from every intervention in healthcare."

The company's main product, its Reverse Engineering and Forward Simulation platform, uses a supercomputer-backed framework to automate the extraction of causal network models directly from observational data. It then uses high-throughput simulations to generate new insights about disease starting, in effect, with no hypothesis, just data.

"It's directed guessing on a massive scale," says Hill, co-founder, CEO, and president of GNS. "We're able to test out potential answers very rapidly. That means we can now discover predictive biomarkers by reverse engineering a disease from lots of clinical trial data and observational data and then applying that data to direct treatment."

In collaboration with Biogen Idec, the company has used simulations to identify novel therapeutic targets for the one-third of rheumatoid arthritis patients who don't respond to anti-TNF therapy. Using gene expression and clinical outcome data from 77 patients receiving anti-TNF therapy, GNS identified intervention points that improved patient outcomes, uncovering both known drug targets and novel intervention points.

That partnership, announced in March 2011, led to the publication of a paper in the journal *PLoS Computational Biology* describing an experimental and computational approach to integrating clinical, molecular, and genetic data into dynamic models of disease progression and drug response.

In another partnership, with Bristol Myers-Squibb in August 2011, GNS discovered novel disease biology and biomarkers in the area of immune-inflammation.

This August, CHDI Foundation, a non-profit research organization hired GNS as part of a systems biology initiative it is pursuing to illuminate the complex biology underlying Huntington's disease. The foundation is seeking to create a model of the debilitating neurodegenerative disorder that will allow researchers to better understand the biological mechanisms in play, and how they might intervene in biologic pathways of the disease before testing novel experimental therapies in animal models.

"What we're ultimately trying to do is understand the control points of those pathways and how, if we intervene at a key point by activating or suppressing a gene, we'll change the whole dynamic of that pathway," says Jeff Arronson, the foundation's director of bioinformatics.

Under the collaboration, GNS will employ its platform to reverse engineer network models from genomic expression and cell signaling data. The foundation anticipates that the results from millions of in silico simulations of GNS' models will provide new insights into the fundamental mechanisms of Huntington's disease, enabling the development of new, more effective treatments. It is paying GNS to create a model that it will eventually share with hundreds of researchers around the world in academic, pharma, and biotech research labs, as well as contract research organizations, it partners with.

In addition to drug developers, GNS has also caught the attention of investors, such as Cambia Health Solutions. Cambia, which runs Blue Cross Blue Shield-branded insurance, invested $5 million in the company in April 2012. It was impressed by the company's ability to automatically create predictive models that can show how a given treatment or combination of treatments will likely affect a patient's outcome.

Hill says that he plans to aggressively grow GNS and will likely seek additional financing next year.

"We have this very audacious vision," he says, "that we can replace this standard of care paradigm that's based on an average patient, but isn't targeted to you, with an individualized or stratified approach."

Therapeutic Partnering Deals through the First Seven Months 2011 vs. 2012

By stage of asset for deals with disclosed upfronts

	DISCOVERY/ PRECLINICAL		PHASE 1		PHASE 2		PHASE 3/ PRE-APPROVAL		MARKETED	
Year	2011	2012	2011	2012	2011	2012	2011	2012	2011	2012
Total Deals	18	12	6	6	7	5	12	7	10	10
Total Deal Values	6674	3119	1655	1533	1942	1632	3969	2397	1402	740
Average Deal Value	370.8	259.9	275.8	255.5	277.4	326.4	330.8	342.4	140.2	74.0
Total Upfront Values	206	266	113	102	191	189	800	318	269	379
Average Upfront Value	11.4	22.2	18.8	17.0	27.3	37.8	66.7	45.4	26.9	37.9

Note: Values in USD M

Month in Review

» *(continued from page 1)*

energy away from traditional partnerships with biotech companies.

Even though overall deal size is down, exclusive of royalties, upfront payments for deals in which values were disclosed have risen slightly to an average of $27.6 million, from $25.6 million in 2011. That, however, is still below the $29 million average seen in 2010.

Life sciences companies that have gone public in 2012 are up 19.8 percent as a group, beating the broader market indices.

Two life sciences companies completed IPOs in July. Durata Therapeutics, which is developing drugs to treat infectious disease, raised $77.6 million. Hyperion Therapeutics, which is developing drugs for orphan diseases and hepatology, raised $50 million. Both companies priced their offerings below their target range and sold more shares than they had expected to sell in order to raise what they did.

Nevertheless, life sciences companies that have gone public in 2012 are up 19.8 percent as a group, beating the broader market indices. The relatively strong performance of these new issues is a signal that companies that brave the IPO market are becoming aligned with investors on their value. It also reflects that these companies, as a whole, are making progress in their businesses.

Biotech stocks in July outperformed the general market. The major indices managed to stay in positive territory despite recurring concerns about the European debt crisis and the weakness in the U.S. economy. For the month, the Burrill Biotech Select posted a 4.4 percent gain, compared to 1 percent for the Dow Jones Industrial Average and a .2 increase in the Nasdaq Composite Index.

After three-months of wrangling, GlaxoSmithKline reached an agreement to acquire Human Genome Sciences for a total enterprise value of $3.6 billion, the largest M&A transaction for the month. GSK raised its all-cash offer to $14.25 from the $13 it offered in April to close the deal. The acquisition gives GSK full control of Benlysta, its jointly-owned drug for the treatment of lupus and expands the drug giant's portfolio to include experimental drugs for the treatment of diabetes and heart disease. The final price represents a 99 percent premium over Human Genome Sciences' closing price on April 17, the day before GSK's bid for the company became public. Overall, M&A activity in 2012 continues to lag the pace of dealmaking a year ago with global activity down 38.1 percent year-to-date.

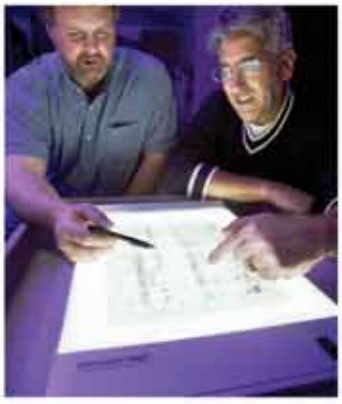
On the venture capital front, financings in July fell to $1 billion, down from $1.3 billion in June. Overall, venture funding for the life sciences (including therapeutics, diagnostics, tools and technology, industrial and agricultural biotechnology, medical devices, digital health, and health IT), continues to outpace the levels seen in 2011, and is up 24 percent year-to-date.

July brought a crop of new drug approvals from the U.S. Food and Drug Administration. This included Onyx Pharmaceuticals' accelerated approval of its multiple myeloma drug Kyprolis based on mid-stage clinical trial data, Vivus' diet drug Qysimia, Amarin's cholesterol-reducing drug Vascepa, and Forest Lab's Tudorza Pressair inhaler to treat chronic obstructive pulmonary disease. Overall, the pace of new drug approvals year-to-date is lagging slightly behind the pace of 2011 with a total of 19 new drugs and biologics approved so far in 2012 compared to 21 during the same period a year ago.

In the wake of the U.S. Supreme Court's decision that upheld most of the Patient Protection and Affordable Care Act, the House made repeated efforts to dismantle the legislation. The House also voted to keep funding for the National Institutes of Health flat for 2013 at $30.6 billion. Though the flat budget is a concern for advocates of biomedical research, there are growing worries about automatic across-the-board budget cuts put into place last year if Congressional representatives fail to agree on reductions to the federal deficit. ■

SHAPING THE FUTURE OF MEDICINE

Medicine is not one size fits all. At the University of Illinois, we recognize that every person is unique, from their personality to their life experiences down to their genetic code. As a world powerhouse in healthcare and biomedical research, we've harnessed the talents of our three campuses, and are poised to apply our vast research knowledge to the innovative delivery of healthcare. Personalized medicine. The future of medicine, from the University of Illinois.



UNIVERSITY OF ILLINOIS
URBANA-CHAMPAIGN • CHICAGO • SPRINGFIELD

research.uillinois.edu | hospital.uillinois.edu

M&A Interest in Diagnostics Heats Up

Rise of personalized medicine focuses attention on tools and diagnostics companies

BY MARIE DAGHLIAN

The pace of diagnostics M&A has accelerated over the past two years, driven especially by tools companies seeking to broaden their offerings and a renewed interest by private equity firms that see the potential of personalized medicine.

With diagnostic technology improving, tools and molecular diagnostics companies are also beefing up their offerings of next-generation sequencing and genomics services in order to be able to provide improved diagnostic capabilities and expand their predictive diagnostic offerings. It's an area that is growing rapidly as DNA sequencing technology not only gets faster and more accurate, but also gets cheaper. Both Life Technologies, through its 2010 acquisition of Ion Torrent, and Illumina, have promised a $1,000 genome before the end of this year.

One of the drivers of the interest in diagnostics is the growing number of cases in which diagnostics have played a role in successful clinical trials.

Agilent, Thermo Fisher Scientific, and Life Technologies have all made major acquisitions in the diagnostics space in 2012. Agilent Technologies bought Dako from EQT, a Sweden-based private equity group, for $2.2 billion, making the deal the largest in Agilent's history. It was a move designed to grow revenues through a strengthened presence in life sciences.

Dako, a cancer diagnostic company based in Denmark, is well known in the industry for its companion diagnostics and was the company that made the first test for the HER2 gene, which is used to predict whether a breast cancer patient will respond to treatment with Genentech's drug Herceptin, an early poster child for targeted cancer therapies.

Less than a year after acquiring Swedish diagnostics maker Phadia, a developer of blood-test systems to support the clinical diagnosis and monitoring of allergy and autoimmune diseases for $3.5 billion, Thermo Fisher Scientific paid $925 million for One Lambda, a privately-held biotech that makes tests used by transplant centers to determine whether a patient and donor are compatible.

Increasing global demand for transplant procedures and post-transplant patient monitoring were drivers of the deal. The acquisition strengthens Thermo Fisher's in vitro diagnostics strategy and is complementary with its existing business.

Life Technologies made a move into the field of genetic diagnostics with the acquisition of personal genetic testing company Navigenics. Life Tech said it is the first step in executing against its strategy to build out its molecular diagnostics business to meet the need of a combination of technologies and informatics that will be needed to personalize medicine and healthcare.

One of the drivers of the renewed interest in diagnostics is the growing number of cases in which diagnostics have played a role in successful clinical trials. With pharmaceutical companies moving from the blockbuster model to targeted therapies, there is an increasing need for diagnostics that can identify the patient population most likely to benefit from a particular therapy. However, pharmaceutical companies, for the most part, have relied on partnering rather than M&A to develop companion diagnostics.

Partnering is likely to continue to be the dominant trend for drugmakers in the near future, but tensions remain. Diagnostics makers want a greater share in the value of companion diagnostic therapies. They may have to wait years for a drug to get approved, and, if it is approved, may have a very limited market for a test even though the companion drug generates significant revenues. They argue that in the absence of their tests, a targeted therapy may never get to market and could not succeed. Pharmaceutical companies, though, feel that they must bear the high cost and risk of drug development and should therefore also enjoy the rewards. But these issues are beginning to be addressed earlier in the partnering process.

It will be interesting to see if drugmakers decide to make their own diagnostics, possibly through an acquisition. Until then, tools companies and diagnostics companies are consolidating to improve their offerings and expand into increasingly competitive emerging markets where demand is strong for their products.

Select Diagnostics M&A, 2011-2012

ACQUIRER	TARGET	DEAL VALUE (USD M)	PRINCIPAL ASSET/RATIONALE
Danaher	Beckman Coulter	6,800.0	Tools company Danaher will acquire Beckman Coulter, a developer, manufacture, and marketer of products for biomedical testing, for $83.50 per share in cahs, a 45 percent premium to its closing price before news of an acquisition were made public, valuing the deal at $6.8 billion including debt assumed and net of cash acquired.
Hologic	Gen-Probe	3,720.0	Hologic acquires Gen-Probe for $82.75 per share in cash, or $3.7 billion to add to its complementary molecular diagnostics and services to Hologic's growing diagnostics portfolio and offer a wide spectrum of health products globally. The transaction allows Hologic to combine Gen-Probe's superior automation platforms and extensive menu of infectious disease tests, with its strong global market presence and strong partnership with Novartis. Synergies include significant cross-selling opportunities, utilizing the combined global sales force and complementary R&D and operational capabilities.
Agilent Technologies	Dako (Denmark)	2,200.0	Agilent Technologies will acquire Dako, the Denmark-based cancer diagnostic company and a leading provider of companion diagnostics to major pharmaceutical companies, which may be used to identify patients most likely to benefit from a specific targeted therapy. Dako's products are sold in more than 100 countries, and in 2010 its annual revenue was approximately $340 million. It is Agilent's biggest acquisition to date.
Thermo Fisher Scientific	Phadia (Sweden)	3,500.0	Thermo Fisher Scientific acquires Phadia, a global leader in allergy and autoimmunity diagnostics, from European private equity firm Cinven, for approximately $3.5 billion in cash. Phadia develops, manufactures and markets complete blood-test systems to support the clinical diagnosis and monitoring of allergy and autoimmune diseases.
Thermo Fisher Scientific	One Lambda	925.0	Thermo Fisher Scientific will acquire privately-held One Lambda, the leader in transplant diagnostics, for $925 million in cash. One Lambda's diagnostic tests are used by transplant centers for tissue typing, primarily to determine the compatibility of donors and recipients pre-transplant, and to detect the presence of antibodies that can lead to transplant rejection.
Life Technologies	Navigenics	N/A	Life Technologies acquires personal genetic testing firm Navigenics, the first step in a strategy to build out its molecular diagnostics business through internal development, partnerships, and select acquisitions. Navigenics' multidisciplinary expertise, including its technology infrastructure, user interfaces, online platforms, genomic support services, and an experienced team, will play a central role in the delivery of Life Technologies' molecular diagnostic model.
Life Technologies	Pinpoint Genetics	N/A	Life Technologies acquires Pinpoint Genomics, Inc., and its early-stage non-small cell lung cancer test that can help doctors identify those early-stage patients at high risk for progression to late-disease. The Pinpoint Genomics' laboratory is the first to market an application that has been rigorously validated in large-scale, independent studies to reliably predict the risk of death for early-stage lung cancer patients.
GE Healthcare (GE)	SeqWright	N/A	GE Healthcare acquries SeqWright, a provider of nucleic acid sequencing and other genomic services, adding complementary genomics capabilities to Clarient, a GE Healthcare's molecular diagnostics unit and providing a platform for Clarient to expand its clinical diagnostic offerings to include next generation sequencing.
Wuhan Humanwell Healthcare (China)	Beijing Baron Medical (China)	122.0	Wuhan Humanwell Healthcare will pay 776 million RMB ($122 million) to purchase an 80 percent stake in Beijing Baron Medical Equipment, the largest distributor of Roche's in-vitro diagnostic products in China.
Shanghai Fosun Pharma (China)	SD Biosensor (South Korea)	N/A	Shanghai Fosun Pharma acquires an 18 percent stake in SD Biosensor Inc., a Korean company that makes in-vitro diagnostic devices. Fosun will become SDB's China distributor as part of the deal. Fosun said SDB's products would add rapid diagnostic tests to its existing portfolio of diagnostic kits. SDB, a 2010 spinout of Standard Diagnostics, makes rapid tests for blood sugar and blood lipids that are sold mainly to emergency rooms of hospitals, clinics and individuals who need to check their blood sugar levels.
Quest Diagnostics	Athena Diagnostics (Thermo Fisher Scientific)	740.0	Thermo Fisher Scientific sells its Athena Diagnostics unit to Quest Diagnostics, a leading provider of diagnostic testing, information, and services, for $740 million. Athena Diagnostics is a leading reference laboratory that provides comprehensive diagnostic testing for neurological and other diseases, with an emphasis on gene-based tests.

(continued) »

(continued)

Select Diagnostics M&A, 2011-2012

ACQUIRER	TARGET	DEAL VALUE (USD M)	PRINCIPAL ASSET/RATIONALE
Quest Diagnostics	Celera Corporation	657.0	Quest Diagnostics acquires Celera Corporation, one of the world's pioneers in genetic diagnostics discovery and development, for $8 per share, representing a transaction value of approximately $344 million.
Novartis (Switzerland)	Genoptix	470.0	Novartis acquires Genoptix for $25.00 per share in cash, or approximately $470 million, representing a premium of 39 percent over Genoptix' closing price before the deal was announced.
Qiagen (Germany)	Cellestis (Australia)	380.0	Qiagen will acquire Australian biotech Cellestis Limited for approximately $355 million in cash, providing Qiagen with access to a novel "pre-molecular" technology that offers a new dimension in disease detection not currently possible with other diagnostic methods.
Qiagen (Germany)	Ipsogen (France)	131.0	Qiagen acquires approximately 47 percent of Ipsogen at $12.90 per share and will launch a process to acquire all remaining shares at the same price, representing a 71.3 precent premium to Ipsogen's share price of 7.53 before the offer was made. Ipsogen develops and markets molecular diagnostic tests designed to map diseases in order to guide patients and oncologists' decisions along their complex therapeutic path.
Qiagen (Germany)	Intelligent Bio-Systems	N/A	Qiagen acquires next-generation sequencing firm Intelligent Bio-Systems and launches an initiative aimed at pushing sequencing technologies into the molecular diagnostics and clinical research markets. Privately held IBS recently unveiled a new sequencing-by-synthesis instrument for targeted sequencing.
Alere	Axis-Shield (United Kingdom)	375.0	Alere Inc., a global leader in rapid diagnostics and health management, is acquiring Axis-Shield in a cash offer for the entire issued and to be issued ordinary share capital of Axis-Shield.
Roche (Switzerland)	mtm laboratories (Germany)	260.0	Roche will acquire mtm laboratories AG, a privately-held German in vitro diagnostics company with a focus on early detection and diagnosis of cervical cancer. Roche will pay mtm shareholders an upfront payment of approximately $180 million as well as up to approximately $85 million upon reaching performance-related milestones.
Roche (Switzerland)	PVT (Germany)	119.0	Roche acquires German clinical lab automation firm PVT and its U.S. sales and distribution subsidiary for $91 million upfront and up to $28 million in performance-related milestones. PVT specializes in the development of custom automation and workflow solutions for in vitro diagnostic testing in commercial and hospital laboratories. Roche says the acquisition will bolster its position in the core laboratory sector, a market it estimates was worth $15.3 billion in 2009.
LabCorp	MEDTOX Scientific	241.0	Laboratory Corporation of America Holdings will acquire MEDTOX Scientific, Inc., a provider of high quality specialized laboratory testing services and on-site/point-of-collection testing devices, for $27.00 per share in cash, representing a total enterprise value of approximately $241,000,000.
LabCorp	Orchid Cellmark	85.4	Laboratory Corporation of America will acquire Orchid Cellmark Inc., an international provider of DNA testing services primarily for forensic and family relationship applications. Orchid Cellmark strengthens LabCorp's presence and strong brand name in identity testing in the United States and establishes its presence in identity testing in the United Kingdom.
Luminex Corporation	GenturaDx	60.0	Luminex will acquire molecular diagnostics company GenturaDx for $50 million in cash and up to an additional $10 million in development and regulatory milestones, expanding Luminex's instrument products portfolio, as Luminex plans to advance the late-stage development of GenturaDx's integrated sample-to-answer real-time polymerase chain reaction system and combine it with its MultiCode-RTx assay to develop a highly efficient yet affordable system for molecular diagnostic testing.

KELLY® scientific resources

a world of trust in a drop of distinction

Trust your workforce to an industry leader

Companies everywhere are facing a common challenge: grow their businesses while minimizing fixed costs. Many life sciences companies achieve this balance through a highly skilled workforce of specialized experts who are easily engaged, scaled, and reassigned for specific processes. A workforce with this kind of versatility can shorten your projected timelines, increase productivity, keeping expenses down.

Kelly® has the kind of functional and flexible workforce solutions you need to enjoy a distinct competitive advantage in today's workforce transformation. We are the world's most recognized scientific staffing provider and a respected workforce partner to hundreds of companies around the globe. We understand that access to skilled professionals remains the catalyst of success in all life sciences environments, and with more scientific professionals turning to Kelly every day, you can trust us to deliver workforce solutions that work for you.

Key areas of focus:

:: Bioprocessing
:: Molecular and cellular biology
:: Protein Synthesis
:: Clinical Research
:: Biochemistry
:: QA/QC
:: Regulatory affairs

Transform your workforce

Contact any of our global offices. Send us an e-mail or visit our Web site today to find the office nearest you.

E-mail: scientific@kellyservices.com :: Web: kellyservices.us/science

Contract :: Contract to hire :: Direct hire

Visit us on

Companion Diagnostics Poised for Breakout

More transparent guidance, burgeoning partnerships reveal tangible progress

BY VINAY SINGH

When the U.S. Food and Drug Administration approved Roche's melanoma drug Zelboraf simultaneously with a companion diagnostic test in August 2011, it said the approval of the two together was "a great example of how companion diagnostics can be developed and used to ensure patients are exposed to highly effective, more personalized therapies in a safe manner."

In the decade plus since the Human Genome Project brought the world to the cusp of a promising new frontier, the advent of biomarker validation and personalized therapies have been slow to catch on. Whether it was regulatory uncertainties, scientific challenges, drug company hesitation, or reimbursement barriers, the adoption of promising companion diagnostic technologies has been slow.

In the last year, however, the push for more effective, safer, and more personalized therapies, as well as the FDA's clarity with its companion diagnostic guidance has accelerated the pace of adoption.

Last year saw the approvals of Xalkori and Zelboraf, two cancer drugs approved simultaneously with a required companion diagnostic. That marked the first such time a drug/diagnostic simultaneous approval had occurred since Genentech's breast cancer drug Herceptin was approved with Dako's test for the HER2 protein in 1998.

And though Vertex's cystic-fibrosis drug, Kalydeco, was not approved simultaneously with a companion diagnostic in January of this year (because the needed diagnostic test had already been approved by the FDA), both the European Medicines Agency and the FDA recommend that the companion diagnostic test be used to determine whether the drug is appropriate for a given patient.

But that's still just incremental improvement for an industry that, as of August 2011, only had 1 percent of its marketed drugs combined with a companion diagnostic. And in the indication where therapeutic drugs and companion diagnostics have had much of their success, oncology, only 3.3 percent of the 86 approved oncology drugs since 1995 have a required companion diagnostic. Only 15 percent of those drugs have "recommended" companion diagnostics.

And an examination of both the FDA's and EMA's approved companion diagnostics reveals relatively few devices. Though the FDA has approved 15 companion diagnostic devices only four biomarkers are required to be tested before deciding the therapeutic drug's use.

More telling of the prospects of companion diagnostics, though, is the interest pharmaceutical companies have taken in them, especially Big Pharma. Big names like Roche, Pfizer, Merck, AstraZeneca, Bristol-Myers Squibb, and Eli Lilly have been some of the most active deal makers in the space in recent years. In 2008, only seven companion diagnostics partnerships with pharmaceutical companies were struck. In 2011, that number rose to 34. If the trend from the first quarter of 2012 continues, 40 or more such deals will be struck by the end of 2012.

On the number of approvals alone, the growth of companion diagnostics is incremental, but with more clarity provided from the FDA's guidance last year and a plethora of newly announced companion diagnostic deals in recent years, companion diagnostics seem poised to become a major tool for pharma companies as they wade through the post "blockbuster" drug era.

The upswing in such partnerships isn't soon to end. "In the past, there was a lot of hype and not much happening," says Loic Kubitza, a director with PwC. "Recent years have really confirmed the upswing. There is no way back. This trend is going to continue."

Select Therapeutic Drugs with FDA/EMA required/recommended Companion Dx

DRUG	INDICATION	COMPANY	COMPANION DX TEST/ MARKER	COMPANY	NOTES
Xalkori	lung cancer	Pfizer	VYSIS ALK Break Apart FISH Probe Kit	Abbott Molecular	Approved simultaneously w/ Companion Dx by FDA
Zelboraf	melanoma	Roche Plexxikon	COBAS 4800 BRAF V600	Roche Molecular Systems	Approved simultaneously w/ Companion Dx by FDA
Kalydeco	cystic-fibrosis	Vertex	COBAS 4800 BRAF V600	Roche Molecular Systems	
Herceptin	breast cancer	Genentech	PATHWAY ANTI-HER-2/NEU HER2 FISH PharmDx Kit	Ventana Medical Systems Dako America	

(continued)

(continued)

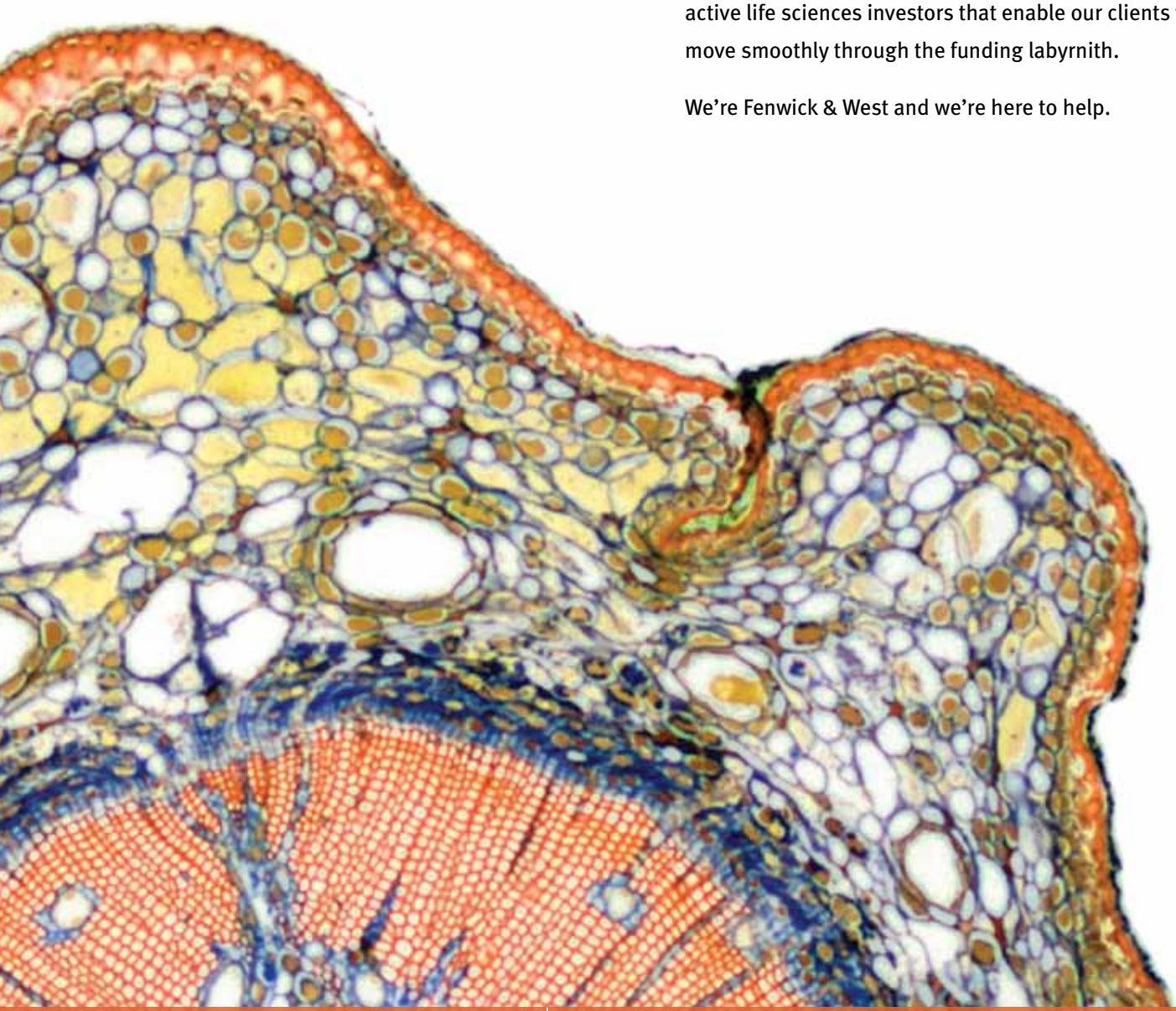
Select Therapeutic Drugs with FDA/EMA required/recommended Companion Dx

DRUG	INDICATION	COMPANY	COMPANION DX TEST/ MARKER	COMPANY	NOTES
Erbitux	anti-colorectal cancer	Bristol-Myers Squibb Eli Lilly	KRAS RGQ PCR	Qiagen	
Iressa	lung cancer	AstraZeneca	EGFR+ Mutation	Qiagen	Non-FDA approved Companion Dx; Iressa approved in 2002 -- sales didn't improve until EGFR Companion Dx in 2009
Perjeta	breast cancer	Genentech	HERCEPTEST HER2 FISH PharmDx Kit	Dako North America Dako North America	
Vectibix	colorectal cancer	Amgen	DAKO EGFR PharmDx KIT KRAS RGQ PCR	Dako North America	
Tarceva	non-small cell lung cancer	OSI Pharmaceuticals	COBAS 4800 w/ EGFR IP	Roche Molecular Systems	
Tasigna	leukemia	Novartis	Philadelphia Chromosomepostive Responders	Multiple	Requires validated Cytogeneic test
Sprycel	leukemia	Bristol-Myers Squibb	Philadelphia Chromosomepostive Responders	In-house	Requires validated Cytogeneic test
Tyverb	breast cancer	GlaxoSmithKline	HER2 overexpression	Monogram Biosciences/ LabCorp	
Selzentry	HIV	Pfizer	CCR5-Chemokine C-C	Multiple	
Ziagen	HIV	GlaxoSmithKline	HLA-B*5701 Test	Monogram Biosciences/ LabCorp	Non-FDA/EMA approved companion Dx
Increlex	Severe primary IGFD	Ipsen	IGF-1 generation Test	Tercica	
Gleevec	cancer	Novartis	DAKO C-KIT PharmDx	Dako North America	
Trisenox	leukemia	Cephalon	PML/RAR-alpha gene	In-house	

A slice of life.

Fenwick's diverse Life Science group is comprised of attorneys, patent agents and scientific advisors with hands-on research experience and advanced degrees, in immunology, biochemistry, cell and microbiology, and genetics. We also have deep ties to some of the most active life sciences investors that enable our clients to move smoothly through the funding labyrnith.

We're Fenwick & West and we're here to help.



SILICON VALLEY 650.988.8500
SAN FRANCISCO 415.875.2300
SEATTLE 206.389.4510

WWW.FENWICK.COM

Fenwick
FENWICK & WEST LLP

JULY STATISTICS

July 2012 Market Movers

TICKER	COMPANY	PRICE 6/30/12	PRICE 7/31/12	PRICE CHANGE	PERCENT CHANGE	REASON
ADVANCERS						
SRPT	Sarepta Therapeutics	3.76	9.07	5.31	141.5	Announced clinical benefit with Eteplirsen its experimental drug for the treatment of muscular dystrophy in a mid-stage study.
TKMR	Tekmira Pharmaceuticals	2.11	3.51	1.40	66.4	Alnylam Pharmaceuticals announced positive results of its early-stage RNAi therapeutic that uses Tekmira's technology.
ALNY	Alnylam Pharmaceuticals	11.65	18.69	7.04	60.4	Announced positive results from an early-stage clinical trial examining its RNAi therapeutics for the treatment of TTR-mediated amyloidosis.
ARRY	Array BioPharma	3.47	5.14	1.67	48.1	ARRY-797 its experimental drug for the treatment of pain in osteoarthritis patients met its primary endpoint in a mid-stage trial.
PSTI	Pluristem Therapeutics	2.40	3.49	1.09	45.4	The life of a patient suffering from bone marrow failure was saved using the company's Placental expanded cells.
NVAX	Novavax	1.56	2.23	0.67	42.9	Released positive preliminary results from a mid-stage trial for its seasonal flu vaccine.
VRNM	Verenium Corporation	3.13	4.40	1.27	40.6	Received regulatory authorization from the EPA to market its next-generation cellulase enzyme for non-food applications.
PRX	Par Pharmaceutical Companies	36.14	49.96	13.82	38.2	Entered into a definitive merger agreement to be acquired by an affiliate of TPG in a $1.9 billion transaction.
NSPH	Nanosphere	2.20	2.98	0.78	35.5	Received FDA approval for its blood-infection test.
SNTA	Synta Pharmaceuticals	5.47	7.35	1.88	34.4	Lead drug ganetespib demonstrated positive anti-cancer activity in multiple targeted patient populations.
DECLINERS						
NasdaqGS: MAKO	MAKO Surgical	25.61	12.74	-12.87	-50.3	Second quarter sales figures for its Robotic Arm Interactive Orthopedic system missed estimates marking the second straight quarter of missing sales estimates.
PGNX	Progenics Pharmaceuticals	9.78	5.21	-4.57	-46.7	Received a complete response letter from the FDA following a review of a supplemental New Drug Application for Relistor an injection for the treatment of opiod-induced constipation.
SCMP	Sucampo Pharmaceuticals	7.03	4.04	-2.99	-42.5	Lost a bid in arbitration to sever ties with Takeda Pharmaceutical its marketing partner for its constipation drug Amitiza.
BPAX	BioSante Pharmaceuticals	2.55	1.48	-1.07	-42.0	Company was removed from both the Russell 3000 and Russell 2000 indices.
ACUR	Acura Pharmaceuticals	3.14	1.86	-1.28	-40.8	Pfizer elected to terminate a deal for the development of three of the company's tamper-resistant painkillers.
AMPE	Ampio Pharmaceuticals	5.08	3.05	-2.03	-40.0	Company priced an offering of more than 4.6 million shares of its stock at an 8.5 percent discount to its previous day's close.
DNDN	Dendreon	7.40	4.76	-2.64	-35.7	Announced that it would close its manufacturing plant in New Jersey and cut 600 jobs over the next year.
REGI	Renewable Energy Group	7.43	4.95	-2.48	-33.4	Second quarter figures came out softer than analyst estimates.
OXBT	Oxygen Biotherapeutics	1.57	1.07	-0.50	-31.8	Auditor gave a going concern opinion regarding the viability of the company to continue to survive.
ROSG	Rosetta Genomics	11.15	7.71	-3.44	-30.9	Priced a follow-on offering of 5 million shares at $5.00 a share and hinted about seeking potential acquisitions.

July Financings: Month Sees an Uptick in IPOs

Biotechs continue to go public, despite pricing below expectations

Of the eight therapeutics developers that have gone public in 2012, only two have priced in their target range. But the companies have performed well in the aftermarket, with the average performance 32.6 percent above their IPO price.

BY MARIE DAGHLIAN

Biotech companies are continuing to go public, despite having to price their shares below expectations in order to get deals done. Both Durata Therapeutics and Hyperion lowered their price and upped the number of shares offered to become public companies.

Durata Therapeutics priced its initial public offering of 7.5 million shares of common stock at $9 per share on July 19. The offering came in below Durata's target price range of $11-$13 per share. Durata said it intended to use approximately $13 million of the proceeds raised to complete clinical development and seek marketing approval in the United States and Europe for its late-stage experimental intravenous antibiotic, Dalbavancin.

Hyperion Therapeutics' IPO followed just one week after Durata's offering. The South San Francisco-based biotech priced 5 million shares of its common stock at $10 per share, just below its $11 to $13 target range, to raise $50 million, the amount it had expected to raise, by increasing the shares offered. Hyperion is focused on the treatment of rare diseases of the liver. The company's lead product, Ravicti, is in development for two orphan indications—urea cycle disorders and hepatic encephalopathy. The U.S. Food and Drug Administration is expected to act on its application to market the drug by October 23 as a treatment for urea cycle disorders, a condition that affects about one in every 10,000 newborns.

The two offerings, coming in between the Tesaro IPO in late June and the Globus Medical IPO in early August, make a total four deals in the space of five weeks, the strongest showing of life sciences IPOs since the beginning of the year when five companies went public in a similar space of time: Renewable Energy Group, Verastem, Cempra, ChemoCentryx, and Ceres.

Of the eight therapeutics developers that have gone public in 2012, only two have priced in their target range. But while the hoped for price hasn't matched what investors are willing to pay, the companies have performed well in the aftermarket with the average performance of the group up 32.6 percent above their IPO price as of this writing. Supernus Pharmaceuticals, which went public at the beginning of May, is up 159 percent, the best performer so far among all U.S. IPOs in 2012.

On average, the eight drug developers are up an average 33 percent, delivering a strong performance since their public debut. This has come at a price however, since as a group they had to discount their offering price by an average 26.1 percent below the midpoint of their target range and sell 37.6 percent more shares than originally intended. Even with the steep price cut, as a group they raised 13.2 percent less than they had said they would in the last regulatory filing before the final offer.

In general, the 11 companies that have gone public so far this year were up on average 19.8 percent, beating all the broader market indices. The eight therapeutics companies that went public in 2011 have also been performing fairly well. Only two among them priced within their target range, but as of July 27, the group is up an average of 28.9 percent from their IPO price.

Right now there are eight drug developers in the IPO queue. Although the IPO market remains challenging, the aftermarket performance of the companies that have gone public in the past couple of years, along with the easing up of the process brought on by the recently enacted JOBS Act, could ease the way for private companies to access public funding. The new rules include a confidentiality period between an initial regulatory filing that allows a startup to test the waters and gauge investor interest, and reduced regulatory compliance requirements for newly public companies.

One thing the JOBS Act is already changing, Mark Heesen, president of the National Venture Capital Association, tells *The Burrill Report*, is the view of entrepreneurs that an IPO is a viable option. This would be a welcome change for the industry.

Performance of 2012 US IPOs

COMPANY	TICKER	CATEGORY	IPO DATE	TARGET PRICE RANGE (USD M)	CAPITAL RAISED (USD M)	ACTUAL NUMBER OF SHARES (USD M)	OFFERING PRICE (USD)	PRICE 7/31/12 (USD)	RETURN FROM IPO
Renewable Energy Group	REGI	Industrial/Ag	1/19/12	13-15	72.0	7.2	10.0	5.48	-45.2%
Verastem	VSTM	Therapeutics	1/26/12	9-11	63.3	6.3	10.0	9.72	-2.8%
Greenway Medical Technologies	GWAY	Digital Health	2/1/12	11-13	77.0	7.7	10.0	13.44	34.4%
Cempra	CEMP	Therapeutics	2/3/12	11-13	58.0	9.7	6.0	8.36	39.3%
ChemoCentryx	CCXI	Therapeutics	2/8/12	14-16	63.8	6.4	10.0	14.64	46.4%
Ceres	CERE	Agbiotech	2/22/12	21-23	65.0	5.0	13.0	8.89	-31.6%
Merrimack Pharmaceuticals	MACK	Therapeutics	3/28/12	8-10	100.1	14.3	7.0	8.32	18.9%
Supernus Pharmaceuticals	SUPN	Therapeutics	5/1/12	12-14	50.0	10.0	5.0	12.94	158.8%
Tesaro	TSRO	Therapeutics	6/27/12	12-15	86.8	6.4	13.5	13.67	1.3%
Durata Therapeutics	DRTX	Therapeutics	7/19/12	11-13	77.6	8.6	9.0	8.70	-3.3%
Hyperion Therapeutics	HPTX	Therapeutics	7/26/12	11-13	57.5	5.8	10.0	10.20	2.0%
AVERAGE PERFORMANCE IPO TO DATE									**19.8%**

Venture Financings in July 2012

COMPANY	RAISED (USD M)	PRINCIPAL FOCUS	FINANCING ROUND	INVESTORS
NantPharma	125.0	Therapeutics	Private equity investment	Blackstone Group
Elevance Renewable Sciences	104.0	Industrial/Ag	Series E	Genting Berhad; Total Energy Ventures International
bluebird bio	60.0	Therapeutics	Series D	Deerfield Partners; RA Capital; Ramius Capital Group; two undisclosed investment funds; ARCH Venture Partners; Third Rock Ventures; TVM Capital; Forbion Capital Partners; Shire
Agile Therapeutics	40.0	Therapeutics	Series C	Aisling Capital; Care Capital; Investor Growth Capital; ProQuest Investments; Kaiser Permanente Ventures; Novitas Capital
Histogenics	37.5	Medical devices	Series A, part of $58M round	Sofinnova Ventures; Split Rock Partners; BioMed Ventures; FinTech GIMV Fund; ProChon Holdings; Altima Partners; Foundation Medical Partners; Inflection Point Capital; Boston Millennia Partners
Celltex Therapeutics	34.1	Tools/Technology		Not disclosed
Avinger	32.7	Medical devices	Series D (Round 4)	Lucas Venture Group, RWI Ventures
Valence Health	30.0	Healthcare IT		North Bridge Growth Equity
Siluria Technologies	30.0	Industrial/Ag		Vulcan Capital; Bright Capital (Russia); Kleiner Perkins Caufield & Byers; Alloy Venture; ARCH Venture Partners; Altitude Life Sciences Ventures; Lux Capital; Presidio Ventures (Sumitomo)
Mersana Therapeutics	27.0	Therapeutics	Series A-1	New Enterprise Associates; Pfizer Venture; Fidelity Biosciences; ProQuest Investments; Rho Ventures; Harris and Harris Group

(continued)

» *(continued)*

Venture Financings in July 2012

COMPANY	RAISED (USD M)	PRINCIPAL FOCUS	FINANCING ROUND	INVESTORS
Juventas Therapeutics	22.2	Therapeutics	Series B	Triathlon Medical Ventures; Early Stage Partners; Takeda Ventures; Venture Investors; Global Cardiovascular Innovation Center; Tri-State Growth Fund; Glengary; angel investors
CoDa Therapeutics	19.4	Therapeutics	Series B, second close	RusnanoMedInvest (Rusnano); Domain Associates; GBS Ventures BioPacificVentures
Onconova Therapeutics	19.4	Therapeutics	Part of $30 million round	Not disclosed
Neos Therapeutics	18.3	Therapeutics	Equity; part of $30M round	Not disclosed
Ultragenyx	15.1	Therapeutics	Series B, part of $30M round	Not disclosed; existing investors include TPG Biotech; HealthCap; Fidelity Biosciences; Pappas Ventures
Harvest Power	15.0	Industrial/Ag	Series C extension	Tur Partners; Industry Ventures
Cardiosolutions	14.9	Medical devices	Equity only	Sorin Group (Italy); existing investors
CytomX Therapeutics	12.6	Therapeutics	Series B	Canaan Partners; Third Rock Ventures; Roche Venture Fund
Cerapedics	12.1	Medical devices	Equity; part of $18M round	Not disclosed
SoloHealth	12.0	Digital Health	Equity	Not disclosed
BioNano Genomics (BioNanomatrix)	11.6	Tools/Technology	Series B-1	Not disclosed
Chiasma	10.0	Therapeutics	Series D, first tranche of 38.5M	Abingworth; MPM Capital; 7 Med Health Ventures; ARCH Venture Partners; F3 Ventures; Fredric Price, CEO of Chiasma
PTC Therapeutics	7.0	Therapeutics	Series C close	Credit Suisse First Boston Equity Partners; HBM BioVentures; Vulcan Ventures; Celgene; Delphi Ventures; The Column Group; Novo A/S; other existing investors
Nico Corp	6.6	Medical devices	Equity	Not disclosed
Altura Medical	6.0	Medical devices	Equity	Not disclosed
TesoRx Pharma	5.9	Therapeutics	Equity; Part of $6.6M round	Not disclosed
Coferon	5.5	Therapeutics	Series B, Part of $12 M round	Hatteras Venture Partners; MedImmune Ventures; Ascent Biomedical Ventures
Miromatrix Medical	5.3	Medical devices	Equity	Not disclosed
Altor Bioscience	5.1	Therapeutics	Equity	Not disclosed
Mascoma	5.0	Industrial/Ag	Convertible debt	Not disclosed
MiCardia	4.4	Medical devices	Internal round of funding	Not disclosed
Visiongate	4.1	Medical devices	Equity	Not disclosed
Remedy Pharmaceuticals	4.1	Therapeutics		Not disclosed
Liquidia Technologies	3.8	Tools/Technology	Series A extension	Canaan Partners; Firelake Capital Management; Bill & Melinda Gates Foundation; Morningside Group; New Enterprise Associates; Pappas Ventures; PPD; Wakefield Group; Siemens Venture Capital
Aerial BioPharma	3.8	Therapeutics		Rex Health Ventures; 3G Capital; angel investors; undisclosed investors
Lantos Technologies	3.8	Medical devices	Part of $6.6 million round	Not disclosed
SRKP 16 (Arrogene Nanotechnology)	3.7	Therapeutics	Equity	Not disclosed

(continued) »

» *(continued)*

Venture Financings in July 2012

COMPANY	RAISED (USD M)	PRINCIPAL FOCUS	FINANCING ROUND	INVESTORS
OvaScience	3.4	Therapeutics	Series B extension	General Catalyst; Bessemer Venture Partners; Longwood Fund; BBT Capital Management Advisors; Cycad Group; Hunt BioVentures; RA Captial; unnamed global institutional investor; other investors
Tolero Pharmaceuticals	3.3	Therapeutics	Part of $13.9M round	Not disclosed
Vedantra Pharmaceuticals	3.3	Therapeutics	Seed stage, Part of $5M round	Not disclosed
iWalk	3.1	Medical devices		Not disclosed
Relmada Therapeutics	3.0	Therapeutics	Series A	BioAdvance; Ben Franklin Technology Partners of SE PA; Wonpung Mulsan
Maculogix (Apeliotus Technologies)	2.9	Diagnostics	Equity, part of $3.94M round	Not disclosed
MedShape Solutions	2.5	Medical devices	Part of $8 million round	Not disclosed
Vascular Therapies	2.5	Medical devices		Not disclosed
Marval Biosciences	2.5	Tools/Technology	Series A, Part of $30 million round	Not disclosed
Sprout Pharmaceuticals	2.4	Therapeutics		Not disclosed
Enumeral Biomedical	2.3	Tools/Technology		Harris & Harris Group
Avancen MOD	2.2	Medical devices	Equity ($1.6M) and debt	Not disclosed
Prosetta Bioconformatics	2.0	Therapeutics	Equity, Part of $15.75M round	Not disclosed
Annovation BioPharma	2.0	Therapeutics	Equity, part of $8M round	Not disclosed
MicroTransponder	2.0	Medical devices	Seed stage	Undisclosed angel investors
Orametrix	2.0	Medical devices		Not disclosed
Innocoll Holdings	2.0	Therapeutics	Equity and debt	Not disclosed
AvidBiotics	1.8	Tools/Technology	Part of $2.75M round	Not disclosed
Allurion Technologies	1.7	Medical devices	Equity	Not disclosed
Callidus Biopharma	1.6	Therapeutics		Not disclosed
Phaserx	1.6	Therapeutics	Debt only	Versant Ventures
Applied DNA Sciences	1.5	Tools/Technology	Equity	Not disclosed
BioBehavioral Diagnostics	1.5	Diagnostics	Equity	Not disclosed
ZS Pharma	1.4	Therapeutics	Debt financing	Not disclosed
Beacon Endoscopic	1.3	Medical devices	Part of $4M round	Not disclosed
Sinopsys Surgical	1.2	Medical devices	Equity, part of $2.4M round	Aweida Venture Partners; Colorado Fund I
Armune BioScience	1.1	Diagnostics		Not disclosed

(continued) »

» *(continued)*

Venture Financings in July 2012

COMPANY	RAISED (USD M)	PRINCIPAL FOCUS	FINANCING ROUND	INVESTORS
Inception 3	1.1	Therapeutics	Equity, Part of $10M round	Versant Ventures
Omniox	1.0	Therapeutics	Seed stage; Part of $7.5M round	Ariva Partners
Adamis Pharmaceuticals	1.0	Therapeutics	Debt financing	Gemini Investment Strategies, LLC
Savara Pharmaceuticals	1.0	Therapeutics	Series B	Keiretsu Forum; existing investors
Neuros Medical	1.0	Medical devices	Series B, part of $4M round	Boston Scientific; Glengary; Case Tech Ventures; JumpStart Ventures; NorthCoast Angel Fund; Ohio Tech Angel Fund; Queen City Angel Fund; Physician Investment Group; RiverVest Venture Partners; Blue Tree Allied Angels; ModelVest
Ikonopedia	1.0	Tools/Technology	Seed stage	Not disclosed
PanGenX	0.9	Tools/Technology	Equity, part of $10M round	Not disclosed
BioSurplus	0.9	Tools/Technology	Series A, close	SJF Ventures
Confluence Life Sciences	0.9	Therapeutics		Not disclosed
Toltec Pharmaceuticals	0.7	Therapeutics		Not disclosed
Apellis Pharmaceuticals	0.7	Therapeutics	Equity, part of $3M round	Not disclosed
Nuro Pharma	0.7	Therapeutics		Not disclosed
Stemnion	0.6	Therapeutics		Not disclosed
GeneAssess	0.5	Diagnostics	Seed stage	Foundation Venture Capital
NexGen Medical Systems	0.5	Medical devices	Equity	Not disclosed
Carmot Therapeutics	0.5	Therapeutics	Equity, part of $1.2M round	Column Group
MenoGeniX	0.5	Therapeutics	Equity	Not disclosed
Arrayent Health	0.5	Digital Health	Equity	Not disclosed
Synergy Biomedical	0.4	Tools/Technology	Equity, Part of $1.1M round	Not disclosed
Phthisis Diagnostics	0.4	Diagnostics	Seed stage	Angel investors
Diagnostic Photonics	0.4	Medical devices	Equity	Not disclosed
Nutek Orthopaedics	0.4	Medical devices	Equity	Not disclosed
Transposagen Biopharmaceuticals	0.4	Tools/Technology	Equity, part of $1.275M round	Not disclosed
BioSignia	0.3	Digital Health		Not disclosed
Redpoint International	N/A	Medical devices		Not disclosed
TOTAL U.S VENTURE FINANCINGS	**851.3**			
PsiOxus (United Kingdom)	34.1	Therapeutics	Series B	Imperial Innovations; Invesco; SR One; Lundbeckfond Ventures.
Cell Medica (United Kingdom)	26.5	Therapeutics		Invesco Perpetual; Imperial Innovations; Cancer Prevention and Research Institute of Texas
Genkyotex (Switzerland)	26.3	Therapeutics	Series C extension	Not disclosed

(continued) »

(continued)

Venture Financings in July 2012

COMPANY	RAISED (USD M)	PRINCIPAL FOCUS	FINANCING ROUND	INVESTORS
CartiHeal (Israel)	10.0	Medical devices		Elron, and the remainder from previous investors, Accelmed and Access Medical Ventures
Lab21 (United Kingdom)	7.7	Tools/Technology		Clydesdale Bank
RDD Pharma (Israel)	7.2	Therapeutics	Series A	OrbiMed Advisors
Neuravi (Ireland)	6.5	Medical devices	Series A	Fountain Healthcare Partners and Delta Partners
Inbiomotion (Spain)	2.5	Diagnostics		Ysios Capital Partners; Fundacio Vila Casas; JV Risk Technologies
Domain Therapeutics (France)	2.5	Therapeutics		Seventure Partners; SODIV; AIRFI; IP Growth; Auriga; Sam Eletr
Encycle Therapeutics (Canada)	1.0	Tools/Technology	Seed stage	Quebec Consortium for Drug Discovery
Pyng Medical (Canada)	0.2	Medical devices	Equity	Not disclosed
CellCap (United Kingdom)	0.1	Tools/Technology		North West Fund for Biomedical
TOTAL NON-U.S. VENTURE FINANCINGS	**124.5**			
TOTAL JULY VENTURE FINANCINGS	**975.8**			

July 2012 Public Financings

	COMPANY	TICKER	AMOUNT RAISED (USD M)	PRINCIPAL FOCUS
IPOS				
	Durata Therapeutics	DRTX	77.6	Therapeutics
	Hyperion Therapeutics	HPTX	57.5	Therapeutics
	TOTAL U.S. IPOS		**135.1**	
	Jinhe Biotechnology	SHE:002688	78.6	Therapeutics
	TOTAL NON U.S. IPOS		**78.6**	
	TOTAL JULY IPOS		**213.7**	
PIPES				
	A.P. Pharma	OTC:APPA	53.6	Therapeutics
	Alimera Sciences	ALIM	40.0	Therapeutics
	Palatin Technologies	PTN	35.0	Therapeutics
	Synta Pharmaceuticals	SNTA	25.8	Therapeutics
	Fibrocell Science	OTC:FCSC	9.1	Therapeutics
	TearLab	TEAR	7.9	Diagnostics
	MRI Interventions	MRIC	6.0	Medical devices
	Opexa Therapeutics	OPXA	4.1	Therapeutics

(continued)

» *(continued)*

July 2012 Public Financings

	COMPANY	TICKER	AMOUNT RAISED (USD M)	PRINCIPAL FOCUS
	IsoRay	ISR	3.5	Medical devices
	Interleukin Genetics	OTC:ILIU	3.0	Diagnostics
	Somaxon Pharmaceuticals	SOMX	3.0	Therapeutics
	Verastem	VSTM	2.0	Therapeutics
	Pressure BioSciences	OTC:PBIO	1.2	Tools/Technology
	Pure Bioscience	PURE	0.7	Therapeutics
	TOTAL U.S. PIPES		**194.9**	
	Mologen (Germany)	Xetra:MGN	27.1	Therapeutics
	Synairgen (United Kingdom)	LSE:SNG	3.9	Therapeutics
	iCo Therapeutics (Canada)	TSX-V:ICO	2.5	Therapeutics
	Microbix Biosystems (Canada)	TSX:MBX	0.5	Therapeutics
	Pyng Medical (Canada)	TSX-V:PYT	0.2	Medical devices
	Cynapsus Therapeutics (Canada)	TSX:CTH	0.1	Therapeutics
	TOTAL NON-U.S. PIPES		**34.3**	
	TOTAL JULY PIPES		**229.2**	
FOLLOW-ONS				
	Synageva BioPharma	GEVA	115.0	Therapeutics
	ImmunoGen	IMGN	100.0	Therapeutics
	OraSure Technologies	OSUR	75.0	Diagnostics
	Zogenix	ZGNX	65.0	Therapeutics
	Gevo	GEVO	61.9	Industrial/Ag
	Corcept Therapeutics	CORT	46.4	Therapeutics
	XenoPort	XNPT	40.0	Therapeutics
	Anthera Pharmaceuticals	ANTH	38.0	Therapeutics
	Nanosphere	NSPH	29.0	Diagnostics
	Ampio Pharmaceuticals	AMPE	17.4	Therapeutics
	Pacific Ethanol	PEIX	12.0	Industrial/Ag
	Omeros	OMER	4.5	Therapeutics
	TOTAL U.S. FOLLOW-ONS		**604.1**	
	BrainStorm Cell Therapeutics (Israel)	OTC:BCLI	6.0	Therapeutics
	TOTAL NON-U.S. FOLLOW-ONS		**6.0**	
	TOTAL JULY FOLLOW-ONS		**610.1**	

(continued) »

» *(continued)*

July 2012 Public Financings

	COMPANY	TICKER	AMOUNT RAISED (USD M)	PRINCIPAL FOCUS
OTHER EQUITY				
	Infinity Pharmaceuticals	INFI	27.5	Equity stake by Purdue Pharma
	Alexza Pharmaceuticals	ALXA	20.0	Committed equity financing facility
	Amicus Therapeutics	FOLD	18.6	Strategic investment by GSK
	LifeMap Sciences (BioTime)	BTX	4.0	Share exchange agreement
	EnteroMedics	ETRM	3.6	Warrant exercise
	TOTAL U.S. OTHER EQUITY		**73.7**	
	IntegraGen (France)	Paris:ALINT	2.4	Financing from Aplus Finance
	TOTAL NON-U.S. OTHER EQUITY		**2.4**	
	TOTAL JULY OTHER EQUITY		**76.1**	
DEBT				
	Bristol-Myers Squibb	BMY	2,000.0	Therapeutics
	Hologic	HOLX	1,000.0	Diagnostics
	Biomet	Private	1,000.0	Medical devices
	West Pharmaceutical Services	SWT	168.0	Tools/Technology
	Nektar Therapeutics	NKTR	125.0	Therapeutics
	Gevo	GEVO	40.0	Industrial/Ag
	Coskata	Private	8.9	Industrial/Ag
	Acusphere	Pink:ACUSD	8.0	Diagnostics
	Aperio Technologies	Private	5.5	Medical devices
	Crititech	Private	3.7	Tools/Technology
	TrueVision Systems	Private	2.3	Medical devices
	ULURU	OTC:ULUR	2.2	Therapeutics
	Smisson-Cartledge Biomedical	Private	2.0	Medical devices
	PLC Systems	OTC:PLCSF	1.0	Medical devices
	HealthFusion	Private	0.2	Healthcare IT
	Tarsus Medical	Private	0.1	Medical devices
	SafePath Medical		0.1	Medical devices
	TOTAL U.S. DEBT		**4,367.0**	
	TOTAL JULY DEBT		**4,367.0**	
	OTHER DEBT			
	Hologic	HOLX	2,800.0	Senior secured credit facilities
	Cornerstone Therapeutics	CRTX	30.0	Convertible term loan facility
	Zonare Medical Systems	Private	25.0	Loan
	Insmed	INSM	20.0	Loan
	Navidea Biopharmaceuticals	NAVB	15.0	Credit facility

(continued) »

(continued)

July 2012 Public Financings

COMPANY	TICKER	AMOUNT RAISED (USD M)	PRINCIPAL FOCUS
LensAR	Private	10.0	Debt facility
Plandai Biotechnology	OTC:PLPL	5.6	Loan
TOTAL U.S. OTHER DEBT		**2,905.6**	
Trimel Pharmaceuticals (Canada)	TSX:TRL	7.5	Loan
Affitech (Denmark)	CSE:AFFI	1.8	Loan in three tranches
Warnex (Canada)	TSX-V:WNX	1.2	Secured credit facility
TOTAL NON-U.S. OTHER DEBT		**10.5**	
TOTAL JULY OTHER DEBT		**2,916.1**	

July 2012 Grants and Contracts

COMPANY	AMOUNT RAISED (USD M)	PRINICPAL FOCUS	FUNDING AGENCY
GRANTS			
StemCells	20.0	Neural stem cells	California Institute for Regenerative Medicine
Yulex	6.9	Guayule feedstocks	USDA
Sofie Biosciences	1.0	Molecular PET imaging	NIH SBIR
Soluble Therapeutics	1.0	Protein formulation technology	NIH STTR
Soligenix	0.6	Radiation countermeasures	NIAID SBIR
Biodel	0.6	Fast-acting insulin for use in artificial pancreas	NIH SBIR
XenoPort	0.4	Parkinson's disease	Michael J. Fox Foundation; preclinical
Xeris Pharmaceuticals	0.3	Diabetes drug delivery	NIH SBIR Phase 1
Discovery BioMed	0.2	Adiponectin stimulating drugs	NIH National Center for Complementary and Alternative Medicine
TOTAL U.S. GRANTS	**31.0**		
Nuvo Research (Canada)	5.4	Reformulated immunotherapy	Development Bank of Saxony (Germany)
Oxford Gene Technology (United Kingdom)	3.6	Next-gen sequencing	Two EU-funded clinical research grants
Terumo (Japan)	3.5	Blood cleansing system	US DoD USAMRMC
Bionor Pharma (Norway)	1.7	Vaccines-HIV	GLOBVAC program (for Global Health and Vaccine Research); find cure for HIV using VACC-4x
Leukocare (Germany)	1.0	Device for in vivo trapping of circulating tumor cells	EU Framework Programme 7
Response Biomedical (Canada)	0.3	Ramp POC platform	National Research Council of Canada Industrial Research Assistance Program

(continued)

(continued)

July 2012 Grants and Contracts

	COMPANY	AMOUNT RAISED (USD M)	PRINICPAL FOCUS	FUNDING AGENCY
	Oxford BioMedica (United Kingdom)	0.1	Ophthalmic	Foundation Fighting Blindness
	TOTAL NON-U.S. GRANTS	**15.6**		
	TOTAL JULY GRANTS	**46.6**		
CONTRACTS				
	Battelle	102.0	Biodefense testing services	NIH NIAID
	Expression Analysis	27.0	Genomic analysis	Environmental Protection Agency-5 year contract
	Al BioTech	4.3	Nex-gen sequencing	U.S. government
	MedMira (Canada)	4.2	Rapid test for HIV, Hep B and C	U.S. Army
	Cleveland Biolabs	4.0	Stem cell proliferation drug	Ministry of Industry and Trade of the Russian Federation
	Chembio Diagnostics	0.5	POC influenza test	Centers for Disease Control and Prevention
	TOTAL JULY CONTRACTS	**142.0**		

M&A: Drugmakers Seek Innovation from Academia

Big Pharma in the market for new ways to recharge its R&D

BY MARIE DAGHLIAN

While big pharma tie-ups with universities and research institutes is not new, they have been on the increase in the last couple of years as big drugmakers tap the innovation coming out of academia in an effort to ramp up their lagging R&D productivity while at the same time reduce its cost. More than 30 such deals have been announced during the first seven months of 2012.

Janssen Pharmaceuticals, a subsidiary of Johnson & Johnson, entered into an exclusive licensing agreement with Evotec and Harvard University that gives the company access to a portfolio of small molecule and biologic research programs focused on the regeneration of insulin-producing beta cells in people with diabetes. The agreement, which calls for an upfront payment of $8 million, could be worth $200 million to $300 million in milestones to Evotec and Harvard per product.

AstraZeneca has set up a virtual neuroscience unit called iMed, with the intention of making its neuroscience operations more malleable.

Beta cells synthesize, store, and secrete insulin. Their failure and loss leads to diabetes, which makes the beta cell an important target for both type 1 and type 2 diabetes research.

The agreement follows the CureBeta initiative established in 2011 between Evotec, Harvard, and the Howard Hughes Medical Institute. The collaboration has focused on analyzing and characterizing drug candidates and targets identified by scientists at the Harvard University laboratory of Douglas Melton. During the initial period of the collaboration, Evotec said the initiative established new standards in beta cell regeneration in terms of assays and tools as well as novel high potential targets.

In addition to the upfront and milestone payments, Janssen will pay royalties on future sales of any products that result from the collaboration. The upfront, milestone, and royalty payments will be shared by Evotec and Harvard according to pre-agreed terms. Though the terms were not disclosed, during a call with analysts, Evotec CEO Werner Lanthaler indicated it was close to a 50-50 split.

Evotec also said it will receive additional research support for discovery and early development work that will be conducted in collaboration with Janssen.

During the analyst call, Lanthaler said the deal provides Janssen access to an exclusive portfolio of small molecules and biologics, while expanding Evotec's leadership in beta cell regeneration and accelerating the development of innovative science at Harvard. "This is a great starting point for innovation and something we think the innovation needs more of in the future," Lanthaler says.

AstraZeneca has also teamed up with academia in an effort aimed at boosting the company's new virtualization strategy in neuroscience, an area that has proven extremely difficult to treat given the recent failure of several potential Alzheimer's disease therapies.

The drugmaker will collaborate with researchers from four institutions—Weill Cornell Medical College, Washington University, the Feinstein Institute for Medical Research, and the University of British Columbia—to uncover new targets for Alzheimer's drugs.

The collaboration, known as the A5 alliance, aims to dive into the biology of ApoE, a leading genetic risk factor for Alzheimer's that isn't fully understood.

Alzheimer's affects more than 5 million people in the United States and nearly 36 million people worldwide. The disease is expected to afflict nearly 115 million people by 2050 without new treatments to halt or reverse the disease.

AstraZeneca also said it would purchase early-stage assets from Link Medicine, a biotech start-up focused on research and development in the field of autophagy, an intracellular process that clears and recycles misfolded proteins. Link has also been developing potential new treatments for a range of neurological diseases.

The two deals come just a year after AstraZeneca closed two of its major research centers devoted to neuroscience, one in Sodertalje, Sweden and the other in Montreal, Canada. It was then that AstraZeneca's R&D chief Martin Mackay said the company would continue to invest in neuroscience, but would work to pursue deals defined by "shared cost, risk, and reward with partners."

In place of its shuttered R&D facilities, AstraZeneca has set up a virtual neuroscience unit called the Innovative Medicines Unit, or iMed, with the intention of making its neuroscience operations more malleable. The new deal with Link Medicine marks the third such deal for iMed and adds to AstraZeneca's small molecule assets that target and modulate autophagy, an emerging area of research that can be applied to a range of neurodegenerative diseases.

Though the financial terms of the deal have not been disclosed, AstraZeneca will pay Link Medicine an upfront payment and provide milestones payments when and if the molecules it acquired from Link meet certain value inflection points. AstraZeneca has agreed to take on all of the program's research and development activities.

Menelas Pangalos, executive vice president of the iMed unit says the agreement provides the company "with an entry into an exciting and vital piece of research into autophagy—an area of considerable importance in neuroscience."

July 2012 M&A

ACQUIRER	COUNTRY	TARGET	COUNTRY	DEAL VALUE (USD M)	ASSET STAGE	PRINCIPAL FOCUS
GlaxoSmithKline	United Kingdom	Human Genome Sciences	United States	3,000.0		Biopharmaceuticals
TPG	United States	Par Pharmaceutical	United States	1,840.0		Generics
Roper Industries	United States	Sunquest Information Systems	United States	1,415.0		Healthcare software solutions
Fresenius Kabi	Germany	Fenwal	United States	1,100.0		Tools/Technology
Thermo Fisher Scientific	United States	One Lambda	United States	925.0		Transplant diagnostics
Bayer CropScience	Germany	AgraQuest	United States	500.0	425	Biopesticides
SAIC	United States	maxIT Healthcare	United States	473.0		Healthcare IT
Hill-Rom	United States	Aspen Surgical Products	United States	400.0		Tools/Technology
Steris Corporation	United States	US Endoscopy	United States	270.0		GI endoscopy
Owens & Minor	United States	Movianto (Celesio AG)	Germany	158.0		Tools/Technology
Synergy Pharmaceuticals	United States	Calisto Pharmaceuticals	United States	117.0		GI disorders
eResearchTechnology	United States	invivodata	United States	65.0		Healthcare IT
Luminex Corporation	United States	GenturaDx	United States	60.0	50	Diagnostics
Tecomet	United States	Teleflex' OEM orthopedics	United States	45.2		Orthopedic surgical devices
Aemetis	United States	Cilion	United States	37.3		Biofuels
Innophos Holdings	United States	AMT Labs	United States	27.0		Nutraceuticals
Walvax Biotech	China	Fengmao Biotech	China	16.0		Anemia
Teleflex	United States	Hotspur Technologies	United States	15.0		Medical devices
Binex Company	Korea	Aprogen	Korea	14.0		Antibodies
Sorin Group	Italy	California Medical Laboratories	United States	14.0		Medical technology
FEI Company	United States	AP Tech	Korea	12.0		Supply/service
Accuray	United States	Morphormics	United States	5.7		Imaging software
Pernix Therapeutics	United States	Great Southern Laboratories	United States	4.9		CRO
Chicago Growth Partners	United States	Caprion Proteomics	Canada	4.5	3.9	Biomarkers
Asahi Kasei Corporation	Japan	ThermoGenesis' CryoSeal	United States	2.0		Tools/Technology
Tegal Corporation	United States	CollabRx	United States	N/A		Tools/Technology
AstraZeneca	United States	Link Medicine assets	United States	N/A		Neurology
23andMe	United States	CureTogether	United States	N/A		Bioinformatics
Adcock Ingram	South Africa	Cosme Pharma	India	N/A		Generics
Life Technologies	United States	Navigenics	United States	N/A		Genetic diagnostics
WorldOne	United States	Sermo	United States	N/A		Online physician community
Boehringer Ingelheim	Germany	Funxional Therapeutics drug	United Kingdom	N/A		Inflammatory
Life Technologies	United States	Pinpoint Genetics	United States	N/A		Diagnostics
Sheldonco	Israel	Vaxil BioTherapeutics	Israel	N/A		Vaccines
Kai Medical	United States	Novogen Limited	Australia	N/A		Biotech

July 2012 Partnering

COMPANY/LICENSER	COMPANY/LICENSEE	DEAL TYPE	POTENTIAL DEAL VALUE (USD M)	UPFRONT PAYMENT (USD M)	ASSET PHASE	PRINCIPAL FOCUS
Amylin (Bristol-Myers Squibb)	AstraZeneca (United Kingdom)	Collaboration	3,400.0		Various	Diabetes
Evotec (Germany)	Janssen Pharmaceuticals (J&J)	Licence	308.0	8	Preclinical	Insulin production
Genmab (Denmark)	Johnson & Johnson	Collaboration	178.5	3.5	Discovery	Antibodies
Chimerix	Merck	License	168.5	17.5	Phase 1	HIV infection
Pfizer	Verastem	License	130.5	3.5	Phase 2	Cancer
BioAlliance Pharma (France)	Vestiq	License	44.0		Approved	Anti-infective
NPS Pharmaceuticals	Amgen	License amendment	25.0			Rare diseases
Bill & Melinda Gates	Merck	Collaboration	25.0			Family planning
AspenBio Pharma	Ceva Santé Animale (France)	License	5.0	1		Animal health
Oxford BioMedica (United Kingdom)	Sanofi (France)	License exercise	3.0		Phase 1/2	Ophthalmic, gene therapy
ProMetic Life Sciences (Canada)	NantPharma	Joint venture	2.5			Plasma-derived drugs
Affibody (Sweden)	Swedish Orphan Biovitrum (Sweden)	Collaboration	1.7	0.4		Inflammatory
Cellworks (United Kingdom)	AstraZeneca (United Kingdom)	Collaboration	N/A			Tuberculosis
Albireo (Sweden)	Ferring Pharmaceuticals (Switzerland)	License	N/A		Phase 3	Gastrointestinal
Calixar (France)	Synthelis (France)	Alliance	N/A			Tools/Technology
MDxHealth (Belgium)	Merck KGaA (Germany)	Collaboration	N/A			Companion diagnostic
R-Pharm (Russia)	Merck	License	N/A		Phase 2b	Hepatitis C
AnGes MG (Japan)	Mitsubishi Tanabe Pharma (Japan)	License	N/A		Phase 3	Cardiovascular
Pfizer	SatRx (Russia)	License	N/A			Type 2 diabetes
Proteus Digital Health	Otsuka Pharmaceuticals (Japan)	License	N/A			Digital Health
PDS Biotechnology	Merck KGaA (Germany)	License	N/A		Pre-clinical	Nanotechnology in cancer immunotherapies
Fred Hutchinson Cancer Research Center	Actinium Pharmaceuticals	License	N/A			Monoclonal antibodies
Quintiles	Allscripts	Partnership	N/A			Software solutions
Merck	HTG Molecular Diagnositcs	License	N/A			Breast Cancer Dx
Verastem	Eisai (Japan)	Collaboration	N/A		Discovery	Cancer
Alnylam Pharmaceuticals	Ascletis (China)	Collaboration	N/A		Phase 1 completed	RNAi cancer compound
ChemDiv (Russia)	Abbott Laboratories	Partnership	N/A			Pharmaceuticals
Intellectual Dialog (Russia)	Abbott Laboratories	Collaboration	N/A			Antiviral therapeutics
Healthrageous	Boehringer Ingelheim (Germany)	Partnership	N/A			Digital Health
Galenea	Eisai (Japan)	Partnership	N/A		Discovery	Neurology
Array BioPharma	Clovis Oncology	Collaboration	N/A		Discovery	GI cancer
Synthon (Netherlands)	Watson Pharmaceuticals	License	N/A			Biosimilar trastuzumab
Amicus Therapeutics	GlaxoSmithKline (United Kingdom)	License amendment	N/A		Phase 3	Rare disease
Antisense Therapeutics (Australia)	Tianjin International Joint Academy of Biotechnology and Medicine (China)	Joint venture	N/A		Phase 2	Autoimmune, inflammation

(continued) »

(continued)

July 2012 Partnering

COMPANY/LICENSER	COMPANY/LICENSEE	DEAL TYPE	POTENTIAL DEAL VALUE (USD M)	UPFRONT PAYMENT (USD M)	ASSET PHASE	PRINCIPAL FOCUS
Advinus Therapeutics (India)	P2D Bioscience	Collaboration	N/A			ADHD therapeutics
Arena Pharmaceuticals	Suzhou Connect Biopharmaceuticals (China)	License	N/A			Anti-inflammatory
iBio	GE Healthcare	Alliance	N/A			Biomanufacturing
Areva Med (Areva-France)	Roche (Roche)	Collaboration	N/A			Cancer radio-immunotherapies
Myriad Genetics	Bio-Rad Laboratories	Partnership	N/A			Immunoassays
Yamasa Corp (Japan)	Merck	License	N/A		Preclinical	Infectious disease
Assay Depot	AstraZeneca (United Kingdom)	Partnership	N/A			Virtual research lab
Diabetology (United Kingdom)	USV Limited (India)	License	N/A			Oral insulin
Anchor Therapeutics	Kyowa Hakko Kirin (Japan)	Collaboration	N/A			GPCR drug discovery
Oncobiologics	XOMA	Collaboration	N/A			Drug discovery

Company/Academic/Non-Profit Partnerships in July 2012

COMPANY	COUNTRY	ACADEMIA/NON-PROFIT	COUNTRY	PRINCIPAL FOCUS
Celator Pharmaceuticals	United States	Leukemia & Lymphoma Society	United States	AML clinical trial support
ADC Therapeutics	Switzerland	Cancer Research Technology	United Kingdom	Antibody drug conjugates collaboration
Fluxion Biosciences	United States	Stanford University	United States	Cancer pharmacogenetics
Medicyte	Germany	University of Manchester; University of Pisa	Various	Bioartificial liver project
AstraZeneca	United Kingdom	Cornell University; Feinstein Institute for Medical Research; University of British Columbia; Washington University	Various	Alzheimer's disease partnership
Boehringer Ingelheim	Germany	Harvard University	United States	Translational research collaboration
Abbott Laboratories; AstraZeneca; Bayer; Eli Lilly; GlaxoSmithKline; Merck; Sanofi	Various	Bill & Melinda Gates Foundation; Infectious Disease Research Institute; National Institute of Allergy and Infectious Diseases; Texas A&M University; Weill Cornell Medical College	United States	TB research acceleration
Sanofi	France	Brigham and Women's Hospital (Harvard)	United States	Type 1 diabetes research
Novavax	United States	PATH	Global	RSV vaccine partnership
Novavax; CPL Biologicals	US/India	International Centre for Genetic Engineering and Biotechnology	India	Malaria vaccine collaboration
Life Technologies	United States	Structural Genomics Consortium	United States	Epigenetic antibody master list
ViiV Healthcare	United States	Clinton Health Access Initiative; Mylan	United States	Pediatric AIDS drugs
BGI	China	University of Edinburgh	United Kingdom	Genomics partnership
Cipla	India	Drugs for Neglected Diseases	Global	Partnership to develop HIV anti-retroviral therapy for children

FROM PREDICTION TO PREVENTION

THE ANNUAL BURRILL PERSONALIZED MEDICINE MEETING

SEPTEMBER 13-14, 2012

The 8th Annual Burrill Personalized Medicine Meeting

provides attendees with a window into this personalized medicine world, from where the science had led us to what hurdles need to be overcome and what policies will make personalized medicine a more widely adopted part of our approach to addressing global health issues.

Our agenda features leading authorities across the spectrum of personalized medicine. The meeting encourages participation, frank discussion, and offers opportunities for attendees to connect with small groups of panelists and expert moderators.

This meeting will appeal to:

- Researchers
- Drug/Diagnostics/Tools Developers
- Payors
- Investors/Analysts
- Public Policymakers/Regulators

Location:

Bently Reserve
301 Battery Street
San Francisco, CA 94111

Don't miss this year's keynote speakers:

G. Steven Burrill *CEO, Burrill & Company*

George Church *Professor of Genetics, Harvard Medical School, Director of PersonalGenomes.org*

George Poste, DVM, PhD *Chief Scientist, Complex Adaptive Systems Initiative; Regents' Professor and Del E. Webb Chair in Health Innovation, Arizona State University*

Additional speakers include:

Edward Abrahams
President, Personalized Medicine Coalition

Lewis Bender
CEO, Interleukin

Reni Benjamin
Senior Research Analyst, Burrill & Company

David Brunel
CEO, Biodesix

David Daly
Vice President of Oncology, Life Technologies

Mark Dente
Chief Medical Officer, Healthcare Information Technology, GE

Ashley Ledbetter Dombkowski, PhD
Chief Business Officer, 23andMe

Kenneth Fang
Chief Medical Officer, Vice President, Translational Research & Clinical Development, Integrated Diagnostics

Jay Flatley
President & CEO, Illumina

Andrew Fish
Executive Director, AdvaMedDx

Christopher Nishan Garabedian
CEO President & Director, Sarepta

Marcia K. Horn
President and CEO, ICAN

Zachary D. Hornby
Vice President, Corporate Development, NexDx, Inc.

Sean X. Hu, PhD, MBA
Head, Bionest USA & Managing Partner, North America, BIONEST

Kris Joshi
Global Vice President Healthcare, Oracle

David Levison
President & CEO, CardioDx

Matthew Meyer
Chief Business Officer, XDx

Elemer Piros
Senior Research Analyst, Burrill & Company

Clifford Reid
CEO, Complete Genomics

Michael Sherman
CFO, Endocyte

Michael Shuster
Partner, Fenwick & West

Ralph Snyderman
Chancellor Emeritus, Duke University

Thomas H. Tulip, PhD
Chief Business Officer & Executive Vice President, Navidea

Brian Ward
CEO, diaDexus

David Wetherell
Managing Partner, Burrill & Company

Jason Zhang
Senior Research Analyst, Burrill & Company

To register, visit: http://www.burrillandco.com/personalized_medicine_2012/

JULY PIPELINE

Clinical Trials for July 2012

COMPANY	TICKER	DRUG	INDICATION	RESULT	NOTES
PHASE III					
Eli Lilly	NYSE: LLY	mGlu2/3	Schizophrenia	Failed	mGlu2/3 did not work in a late stage clinical trial that was intended to be the first of two late-stage tests of the drug as a stand-alone treatment in acute schizophrenia. A second trial is continuing and the company expects to conduct an interim analysis and present the results later this year.
Nymox Pharmaceutical	Nasdaq: NYMX	NX-1207	Benign prostatic hyperplasia	Positive	Company reported positive results from a study of long-term treatment outcomes for men who had received a single injection of NX-1207 2.5 mg for treatment for their benign prostatic hyperplasia. The study analysis found that a statistically significant greater number of men who had received NX-1207 2.5 mg reported positive treatment outcomes as compared to men who had received a placebo.
Pfizer Johnson & Johnson Elan Corporation	NYSE: PFE NYSE: JNJ NYSE: ELN	Bapineuzumab	Alzheimer's	Failed	The trial involved individuals who carry a variation of a gene called ApoE4 that makes them far more likely to develop Alzheimer's disease. Pfizer said it and its partners Johnson & Johnson and Elan will continue with three other late-stage trials of bapineuzumab based upon a review by independent safety monitors.
Gilead Sciences	Nasdaq: GILD	Cobicistat	HIV	Positive	The study found that an HIV regimen containing a cobicistat-boosted protease inhibitor was non-inferior to a regimen containing a ritonavir-boosted protease inhibitor at 48 weeks of therapy.
Gilead Sciences	Nasdaq: GILD	Complera	HIV	Positive	The study met its 24-week primary endpoint, which found that switching to Complera was non-inferior to remaining on a ritonavir-boosted protease inhibitor regimen.
Bristol-Myers Squibb	NYSE: BMY	Brivanib	Liver cancer	Failed	Brivanib failed in a late-stage trial to match Nexavar, a cancer treatment sold by Bayer and Onyx Pharmaceuticals, in prolonging the lives of patients with advanced liver cancer. The Bristol-Myers drug is an oral once-daily treatment that blocks receptors to VEGF, a protein involved in many cancers, and also blocks enzymes called FGFR tyrosine kinases that have been linked to cancer.
OncoSec Medical	OTCBB: ONCS	ElectroOncology therapies	Head and neck cancer	Positive	Electrochemotherapy was compared against surgery for quality of life, safety, survival and local control at eight months, where local control is defined as destruction of the treated tumor without evidence of reappearance of the tumor at the treatment site. The data show OMS ElectroChemotherapy achieved the primary endpoint of preserving quality of life compared to surgery, and appeared to be safe and comparable to surgery in achieving control in locally recurrent or second primary SCCHN.
Merck	NYSE: MRK	Odanacatib	Bone fractures in women with osteoporosis	Positive	Merck will stop testing an experimental therapy meant to prevent bone fractures in women with osteoporosis because the drug has worked so well in a late- stage trial.
Celgene	Nasdaq: CELG	Apremilast	Psoriatic arthritis	Positive	In the study, statistical significance for the primary endpoint was achieved for patients receiving apremilast. Patients in the active treatment arms also maintained significant improvements in arthritis-related endpoints through week 24. Significant and sustained improvements in various measures of physical function were also observed in apremilast-treated patients.

(continued) »

(continued)

Clinical Trials for July 2012

COMPANY	TICKER	DRUG	INDICATION	RESULT	NOTES
Ipsen; Inspiration Biopharmaceuticals	ENXTPA: IPN Private	IB1001	Hemophilia	Failed	The U.S. Food and Drug Administration ordered a hold on two late-stage trials of IB1001, for the treatment of hemophilia, after Inspiration Biopharmaceuticals found that patients taking the experimental drug developed antibodies to a protein in the drug.
Eisai	TSE: 4523	Halaven	Breast Cancer	Failed	Eisai said that its experimental breast cancer drug, Halaven, failed to hit its primary endpoints in a late-stage head-to-head trial against the breast cancer drug Xeloda.
D&A Pharma	Private	Alcover	Alcohol dependence	Positive	A study that included alcohol-dependent patients treated by Alcover in the context of usual diagnostic and therapeutic procedures has confirmed the efficacy of Alcover in the treatment of alcohol withdrawal syndrome with 81 percent of patients successfully detoxified.
GlaxoSmithKline	NYSE: GSK	Albiglutide	Type 2 Diabetes	Positive	At the 26-week primary endpoint, albiglutide showed clinically and statistically significant reductions in HbA1c from baseline and superiority versus sitagliptin. At the primary endpoint, weight loss was significantly greater in the albiglutide group than the sitagliptin group. During the full 52-week treatment period, albiglutide was generally well tolerated with diarrhea being the most common adverse event for albiglutide (10 percent) vs sitagliptin (6.5 percent).
GlaxoSmithKline; Theravance	NYSE: GSK Nasdaq: THRX	Long-acting muscarinic antagonist (LAMA) and long-acting beta2 agonist (LABA)	Chronic obstructive pulmonary disease	Positive	Four phase 3 tests of a treatment for chronic obstructive pulmonary disease produced positive results. All four studies were 24 weeks long — two of them compared LAMA/LABA to a placebo (each with about 1,500 participants), while the other two compared it to another treatment, LAMA tiotropium (each had about 850 patients).
Savient Pharmaceuticals	Nasdaq: SVNT	Krystexxa	Chronic gout	Positive	A new publication showed that adult patients with refractory chronic gout treated bi-weekly with Krystexxa experienced statistically significant and clinically meaningful improvements in health-related quality of life, pain and physical function.
PHASE II					
BioInvent	OM: BINV	BI-203	Arterial vessel inflammation	Failed	BI-204, for the treatment of arterial vessel inflammation, failed to meet the primary endpoint in a mid-stage trial.
Vertex Pharmaceuticals	Nasdaq: VRTX	ALS-2200	Hepatitis C	Positive	Results from a viral kinetic study of the nucleotide analogue ALS-2200 for the treatment of hepatitis C showed a median 4.54 log10 reduction in hepatitis C virus RNA in people with genotype 1 chronic hepatitis C who were new to treatment after seven days of dosing with 200 mg of ALS-2200 once daily. ALS-2200 was well-tolerated in this study, and no patients discontinued due to adverse events.
Apogenix	Private	APG101	Recurrent Glioblastoma	Positive	A clinical proof of concept trial with APG101 as treatment of recurrent glioblastoma has met and exceeded expectations in the final analysis of the data.
Novavax	Nasdaq: NVAX	Virus-like Particle vaccine	Influenza	Positive	The study's primary objectives of demonstrating safety and immunogenicity of three ascending dose levels of the quadrivalent influenza vaccine were achieved.
Sarepta Therapeutics	Nasdaq: SRPT	Eteplirsen	Muscular dystrophy	Positive	Sarepta's exon-skipping compound, eteplirsen, achieved a significant clinical benefit on the primary clinical outcome, the 6-minute walk test, over a placebo/delayed treatment cohort in a phase 2b trial in Duchenne muscular dystrophy patients. Eteplirsen administered once weekly at 50mg/kg over 36 weeks resulted in a 69.4 meter benefit compared to patients who received placebo for 24 weeks followed by 12 weeks of treatment with eteplirsen in the open-label extension.

(continued)

» (continued)

Clinical Trials for July 2012

COMPANY	TICKER	DRUG	INDICATION	RESULT	NOTES
Biocryst Pharmaceuticals	Nasdaq: BCRX	Ulodesine	Gout	Positive	The results of the 52-week, blinded phase 2b safety extension trial confirm that ulodesine continues to be generally safe and well-tolerated in gout patients who inadequately responded to allopurinol alone, many of which had multiple co-morbidities. No clinical adverse event signals were observed that distinguished ulodesine from placebo, either by type or by rate at the doses tested. No opportunistic or unusual infections were observed and no signal for other organ toxicities was detected.
Psyadon Pharmaceuticals	Private	Ecopipam	Tourette syndrome	Positive	The mid-stage study was stopped early when a planned interim analysis revealed a statistically significant reduction in the severity of the patients' tic symptoms. This decision was supported by both the independent Drug Safety and Monitoring Committee overseeing the study and by the external Research Committee established as part of Psyadon's partnership with the Tourette Syndrome Association - the nation's largest patient advocacy group for this disorder.
EnVivo Pharmaceuticals	Private	EVP-6124	Alzheimer's disease	Positive	The six-month, double-blind phase 2b clinical trial evaluated EVP-6124 against placebo in patients with mild to moderate Alzheimer's disease. The EVP-6124 2.0 mg dose met both of the trial's primary endpoints with statistically significant positive effects on cognition, as measured by the Alzheimer's Disease Assessment Scale-Cognitive subscale-13 and clinical function, as measured by the Clinical Dementia Rating Scale Sum of Boxes.
Repros Therapeutics	Nasdaq: RPRX	Proellex-V	Uterine fibrosis	Positive	Proellex-V showed consistent efficacy across all 3 endpoints after 4 months of treatment at 12mg vaginal dose.
Bionor Pharma	OSLO: BIONOR	Vacc-4x vaccine	HIV	Positive	The results from further immunological analysis of the phase 2 data with Vacc-4x show improved quality of immune cells, which can in part explain killing of HIV infected cells leading to the reduction in viral load in patients receiving Vacc-4x.
Advaxis	Private	ADXS-HPV	Cervical intraepithelial neoplasia	Positive	ADXS-HPV at low dose meets 50 percent efficacy target. With cohort 2 dosage 6 times higher and cohort 3 dosage 20 times higher, higher response rates with continued safe administration are expected to be achieved.
Immune Response BioPharma	Private	IR501 and IR703	Rheumatoid arthritis	Positive	The data suggest that IR501 and IR703 are safe, well tolerated and effective treatments for RA, particularly in early disease and in patients on physiologic low doses of prednisone. Enhancement of the clinical response may require monthly injections. These observations require confirmation in future clinical trials.
Theravance	Nasdaq: THRX	TD-1211	Opiod-Induced constipation	Positive	TD-1211 is an investigational, orally administered, peripherally selective, multivalent inhibitor of the mu opioid receptor designed with the goal of alleviating gastrointestinal side effects of opioid therapy without affecting analgesia. The positive clinical results support progression into phase 3 development for the treatment of patients with opioid-induced constipation.
Diamyd Medical	OTCPINK: DMYDY	NP2 Enkephalin	Cancer pain	Failed	A phase 2 study evaluating Dyamid's drug candidate NP2 Enkephalin did not meet its primary objective of reducing pain in subjects with severe intractable cancer pain. The treatment was however well tolerated, confirming the safety of the company's NTDDS technology.

(continued) »

(continued)

Clinical Trials for July 2012

COMPANY	TICKER	DRUG	INDICATION	RESULT	NOTES
Osiris Therapeutics	Nasdaq: OSIR	Prochymal	First-time acute myocardial infarction	Positive	Prochymal significantly reduces hypertrophy, arrhythmia and progression to heart failure in patients suffering a heart attack.
Inspiration Biopharmaceuticals	Private	OBI-1	Bleeding in patients with acquired Hemophilia A	Positive	According to the interim analysis, seven out of seven trial participants receiving OBI-1 experienced control and subsequent resolution of their bleeds.
PHASE I					
Protalex	OTCBB: PRTX	PRTX-100	Rheumatoid arthritis	Positive	Preliminary findings from the recently completed phase 1b randomized, multiple-dose, dose-escalation study in adult patients with active rheumatoid arthritis demonstrated that PRTX-100 was generally safe and well tolerated in patients with active RA at all dose levels.
Cytokinetics	Nasdaq: CYTK	Omecamtiv mecarbil	Heart failure	Positive	This clinical trial was conducted by Amgen in collaboration with Cytokinetics and based on the review of thee data, the companies have selected oral formulations of omecamtiv mecarbil from this phase I trial that warrant further evaluation in patients with heart failure. Cytokinetics and Amgen are discussing plans for the initiation of a phase 2 clinical trial of these oral formulations.
BrainStorm Cell Therapeutics	OTC: BCLI	GKT137831	Autologous transplantation cell therapy	Positive	Interim safety review of phase 1 data indicated that autologous transplantation of the company's cell therapy was well-tolerated, appears to be safe for use, and did not present any undue risks to the study participants.
Alnylam Pharmaceuticals	Nasdaq: ALNY	ALN-TTR02	Deadly nerve disease	Positive	Results from this study show that administration of ALN-TTR02 leads to robust knockdown of serum TTR protein levels of up to 94 percent; the overall results were highly significant. Suppression of TTR, the disease-causing protein in ATTR, was found to be rapid, dose dependent, durable, and specific after just a single dose.
Anavex Life Sciences	OTCBB: AVXL	ANAVEX 2-73	Alzheimer's disease	Positive	ANAVEX 2-73 showed efficacy in reversing learning impairments and toxicity in pre-clinical models. The new data from this study confirms both a restorative effect of ANAVEX 2-73, and in combination with donepezil the potential to boost the therapeutic efficacy of each drug.
Pharming Group	NYSE Euronext: PHARM	Lactoferrin	Human lactoferrin safety	Positive	A randomized, cross-over double blind, placebo controlled study in healthy volunteers has shown that Pharming's recombinant human Lactoferrin (rhLF) is safe, based on the assessment of clinical data, gastro-intestinal tolerance and adverse event reporting.
Novavax	Nasdaq: NVAX	Fusion protein nanoparticle	Respitory Syncytial Virus	Positive	The findings from the recent phase 1 trial were consistent with the preclinical results in relevant animal models, which indicated that the Novavax Fusion (F) protein nanoparticle RSV vaccine candidate was generally well-tolerated, highly immunogenic and produced functional antibodies that neutralized RSV.
TiGenix	EURONEXT: TIG	Cx621	Type 1 diabetes	Positive	The confirmation of the safety of intra-lymphatic administration of TiGenix's expanded adipose stem cells opens up the possibility of achieving efficacy at much lower dosage, which would further increase the safety profile of TiGenix's eASCs. An additional benefit is that the subcutaneous lymph nodes are superficial and readily visible by ultrasound, and thus allow for a rapid and easy injection.

Patents Issued in July 2012

COMPANY	TICKER	COMPANY DESCRIPTION	GRANTING AGENCY	PATENT NUMBER	PATENT COVERS
GeNO	Private	Privately held biotechnology company developing innovative nitric oxide generation and delivery platforms to enable the true potential of inhaled nitric oxide to be realized for the treatment of a multitude of diseases	U.S. Patent and Trademark Office	U.S. Patent No. 8,173,072 U.S. Patent No. 8,187,544	Patent No. 8,173,072 covers the conversion of nitrogen dioxide (NO2) to nitric oxide (NO) in a gas stream using the GeNO cartridge technology while Patent No. 8,187,544 covers a unique method for scavenging traces of toxic nitrogen dioxide (NO2) from a gas stream prior to inhalation by a patient.
StemCells	Nasdaq: STEM	company engaged in the research, development, and commercialization of cell-based therapeutics and tools for use in stem cell-based research and drug discovery	Japanese Patent Office	Japanese Patent No. 5,007,003	The patent broadly covers the prospective isolation and enrichment of neural stem and progenitor cells using antibody selection, as well as the use of these cells to treat disorders of the central nervous system.
Raptor Pharmaceutical	Nasdaq: RPTP	Company dedicated to speeding the delivery of new treatment options to patients by working to improve existing therapeutics through the application of highly specialized drug targeting platforms and formulation expertise	European Patent Office	European Patent No. 1,919,458	Patent covers enteric-coated oral formulations of cysteamine bitartrate, including Raptor's proprietary microbead formulation, RP103.
Agennix	XETRA: AGX	Company focused on the development of novel therapies that have the potential to substantially lengthen and improve the lives of critically ill patients in areas of major unmet medical need	U.S. Patent and Trademark Office	Notice of Allowance	Patent covers the use of the oral Dendritic Cell Mediated Immunotherapy talactoferrin alfa (talactoferrin) for the treatment of non-small cell lung cancer and renal cancer in combination with chemotherapy, biotherapy, immunotherapy, surgery, radiotherapy, or a combination thereof.
NeuralStem	AMEX: CUR	Company focused on the development and commercialization of treatments for central nervous system diseases based on transplanting human neural stem cells and small molecule drugs	U.S. Patent and Trademark Office	Notice of Allowance	The patent covers both the culturing of central nervous system cells as well as their transplantation into spinal cord tissue to treat neurodegenerative conditions, including amytrophic lateral sclerosis (ALS or Lou Gehrig's disease).
Neurotez	Private	Company develops biopharmaceuticals for central nervous system disorders	U.S. Patent and Trademark Office	U.S. Patent No. 8,227,408	The patent protects use of the hormone Leptin for treating a progressive cognitive disease, disorder or condition, such as Alzheimer's disease, resulting from accumulation of an amyloid peptide or for improving resilience of cognitive function by modulating the accumulation of the amyloid peptide in brain.
Advanced Cell Technology	OTCBB: ACTC	Specialty pharmaceutical company focused on the development and commercialization of innovative therapies for the treatment of acute and breakthrough pain	Australian Patent Office	Australian Patent No. 2,005,325,753	The patent broadly covers the use of human retinal pigment epithelial cells generated from pluripotent stem cells in the manufacture of pharmaceutical preparations of retinal pigment epithelial cells, and the use of those preparations to treat patients with degenerative diseases of the retina such as Age-related Macular Degeneration.
Research and Diagnostic Antibodies	Private	Provides high quality antibodies, immunoassays, and assay kits to investigators in bio-medical research	Japanese Patent Office	Notice of Allowance	Patent covers very broadly the use of R&D Antibodies' immunoassays, assay kits, and apparatuses for the detection of plasma iNOS as an early biomarker for the prognosis and diagnosis of the life-threatening sepsis pathology.

(continued) »

» (continued)

Patents Issued in July 2012

COMPANY	TICKER	COMPANY DESCRIPTION	GRANTING AGENCY	PATENT NUMBER	PATENT COVERS
DiscGenics	Private	Spinal therapeutics company utilizing adult human disc stem cells within a tissue engineering approach to treat patients debilitated by Degenerative Disc Disease	U.S. Patent and Trademark Office	Notice of Issuance	Patent covers proprietary culture system that includes a resulting composition comprising a disc stem cell population from a nucleus pulposus source that forms Discospheres when grown following the Discgenics culture system method.
Amarin Corporation	Nasdaq: AMRN	Late-stage biopharmaceutical company focused on the development of therapeutics to improve cardiovascular health	European Patent Office	Notice of Intention	This patent application is intended to protect the exclusivity of Amarin's drug candidate, AMR101, for use in an indication that Amarin may seek through the European Medicines Agency.
Egalat	Private	Specialty pharmaceutical company focused on developing safe, effective and tamper-resistant medications	U.S. Patent and Trademark Office	Notices of Allowance	The patent covers Egalat's prolonged release technology. The composition described by the patent family is utilized for all the Egalat opioid products tested in clinical trials including the new improved tablet construction that has a very hard shell surrounding the erodible matrix containing the opioid.
Aegis Therapeutics	Private	Drug delivery technology company commercializing its patented drug delivery and drug formulation technologies through product-specific licenses	U.S. Patent and Trademark Office	U.S. Patent No. 8,226,949	The issuance of this patent has the potential to expand OncoSec's market opportunities for minimally invasive and surgical procedures to treat solid tumors as an adjunct therapy to earlier-stage cancers. Specifically, it allows OMS technology to be used to treat the margins of solid tumors following surgical resection.
Galectin Therapeutics	Nasdaq: GALT	Development stage company focused on the development of therapies for cancer and fibrotic disease	U.S. Patent and Trademark Office	U.S. Patent No. 8,236,780	The patent covers key methods of derivation and use for Galectin's carbohydrate-based galectin inhibitor compound for use in patients with chronic liver disease associated with the development of fibrosis, established liver fibrosis or end-stage scarring, or cirrhosis.
Derma Sciences	Nasdaq: DSCI	Mmedical device and pharmaceutical company focused on advanced wound care	U.S. Patent and Trademark Office	U.S. Patent No's. 8,207,233 and 8,207,234	These patents provide additional intellectual property protection for the company's investigational drug DSC127 by describing the angiotensin peptide in a specific formulation and a method of using the same to treat diabetic foot ulcers.
DNA Genotek	Nasdaq: OSUR	Subsidiary of OraSure Technologies focused on providing high-quality biological sample collection, stabilization and preparation products	U.S. Patent and Trademark Office	U.S. Patent No. 8,221,381	The patent protects a novel container system which consists of a lid that stores a nucleic acid stabilization chemistry and a vial for receiving a biological sample.
Celladon Corporation	Private	Biopharmaceutical company focused on the discovery and development of molecular therapies for cardiovascular diseases	U.S. Patent and Trademark Office	U.S. Patent No. 8,221,738	Patent covers the administration of MYDICAR, Celladon's first-in-class drug under clinical evaluation for advanced heart failure.
Discovery Laboratories	Nasdaq: DSCO	Specialty biotechnology company focused on creating life-saving products for critical care patients with respiratory disease and improving the standard of care for pulmonary medicine	U.S. Patent and Trademark Office	U.S. Patent No. 8,221,772	Patent provides coverage for a method for promoting mucus clearance in a patient with a pulmonary condition characterized by excessive mucus secretion or impaired mucus clearance such as cystic fibrosis, bronchiectasis, ciliary diskinesia, chronic obstructive pulmonary disease, and sinusitis.

(continued) »

» (continued)

Patents Issued in July 2012

COMPANY	TICKER	COMPANY DESCRIPTION	GRANTING AGENCY	PATENT NUMBER	PATENT COVERS
Gelena Biopharma	Nasdaq: GALE	Biotechnology company, engaged in discovering, developing, and commercializing innovative therapies addressing unmet medical needs using targeted biotherapeutics	U.S. Patent and Trademark Office	N/A	Patent covers the use of its product candidate, NeuVax, a HER2/neu peptide vaccine, for inducing immunity to breast cancer recurrence in patients having low-to-intermediate IHC levels of 1+ or 2+ and a FISH rating of less than 2.0. These patients represent a significant unmet medical need, with as much as 80 percent of breast cancer patients who do not qualify for Herceptin therapy.
Integrity Life Sciences	Private	Offers business and consulting services to healthcare and life science sectors	U.S. Patent and Trademark Office	U.S. Patent No's. 6,152,950 and 7,462,189	Patent No. 6,152,950 covers a therapeutic traction table for the treatment of low back pain. Patent No. 7,462,189 covers a spinal treatment apparatus for applying a force to a patient and includes a base portion, a telescoping support, a spinal distraction device and an actuator.
Butamax Advanced Biofuels	Private	Joint venture between BP and DuPont formed to develop and commercialize biobutanol as a next generation renewable biofuel for the transport market	U.S. Patent and Trademark Office	U.S. Patent No. 8,222,017	Patent protects a subset of key enzymes in the isobutanol production pathway.
BioAlliance Pharma	ENXTPA: BIO	Company dedicated to the development of orphan oncology products and supportive care products	U.S. Patent and Trademark Office	N/A	This patent covers the Sitavig tablet, its manufacturing process and its application for the treatment of recurrent labial herpes until 2027. The company has conceived and developed Sitavig for the treatment of labial herpes in immunocompetent patients presenting more than four episodes a year.
StarScientific	Nasdaq: CIGX	Technology-oriented company with a mission to promote maintenance of a healthy metabolism, as well as to reduce the harm associated with the use of tobacco at every level	U.S. Patent and Trademark Office	Notice of Allowance	Patent covers a product formulation that, among other uses, assists in weight loss and also the reduction of tobacco use.
SCOLR Pharma	PINK: SCLR	Specialty pharmaceutical company that applies its formulation expertise and patented CDT platforms to develop novel prescription pharmaceutical, over-the-counter, and nutritional products	European Patent Office	European Patent No. 1,793,809	Patent covers SCOLR's oral modified release ibuprofen formulation, which is based on SCOLR's Controlled Delivery Technology platform.
NuPathe	Nasdaq: PATH	Biopharmaceutical company focused on the development and commercialization of branded therapeutics for diseases of the central nervous system	U.S. Patent and Trademark Office	Notice of Allowance	The allowed claims relate to a rod-shaped implant or structure that delivers therapeutic levels of risperidone for 20 to 190 days as well as to methods for treating medication noncompliance-associated diseases including schizophrenia and bipolar disorder.
ImmunoCellular Therapeutics	NYSE: IMUC	Clinical stage biotechnology company focused on developing and commercializing immune-based therapies for the treatment of brain, ovarian, and other solid tumor cancers	Japanese Patent Office	Notice of Allowance	The patent covers the treatment of brain cancer with a combination of a dendritic cell based vaccine combined either before or concurrently with the administration of chemotherapy.

(continued) »

Patents Issued in July 2012

COMPANY	TICKER	COMPANY DESCRIPTION	GRANTING AGENCY	PATENT NUMBER	PATENT COVERS
BioLine Rx	Nasdaq: BLRX	Clinical stage biopharmaceutical development company, together with its subsidiaries, engages in identifying, in-licensing, and developing therapeutic candidates	European Patent Office	Notice of Intention	Patent covers BL-1020's composition and its use for the treatment of schizophrenia.
AtheroNova	OTCBB: AHRO	Early stage biotechnology company focused on discovery, research, development and licensing of novel compounds to reduce or regress atherosclerotic plaque deposits	U.S. Patent and Trademark Office	Notice of Allowance	Patent covers claims for treating atherosclerosis using a naturall occuring bile acid.
CytRx	Nasdaq: CYTR	Bbiopharmaceutical research and development company specializing in oncology	U.S. Patent and Trademark Office	Notice of Allowance	Patent covers a pharmaceutical composition of tamibarotene in capsule form. Tamibarotene is an orally available, rationally designed, synthetic retinoid compound that was designed to be more potent than the chemotherapeutic agent all-trans retinoic acid.
Avanir Pharmaceuticals	Nasdaq: AVNR	Biopharmaceutical company focused on bringing innovative medicines to patients with central nervous system disorders of high unmet medical need	U.S. Patent and Trademark Office	Notice of Allowance	Patent covers methods for treating pseudobulbar affect or emotional lability using low-dose quinidine formulations of Nuedexta. The new patent will expire on July 17, 2023.

New Drug Approvals* July 2012

	COMPANY	PROPRIETARY NAME	ESTABLISHED NAME	INDICATION
UNITED STATES				
	Amarin	Vascepa	icosapent ethyl	Hypertriglyceridemia
	Onyx Pharmaceuticals	Kyprolis	carfilzomib	Multiple myeloma
	Forest Laboratories	Tudorza Pressair	aclidinium bromide	Bronchospasm associated with chronic obstructive pulmonary disease
	Ferring Pharmaceuticals	Prepopik	sodium picosulfate	Colon clensing
EUROPE				
	Vertex Pharmaceuticals	Kalydeco	ivacaftor	Rare form of Cystic Fibrosis
	Eisai	Fycompa	perampanel	Partial-onset seizures

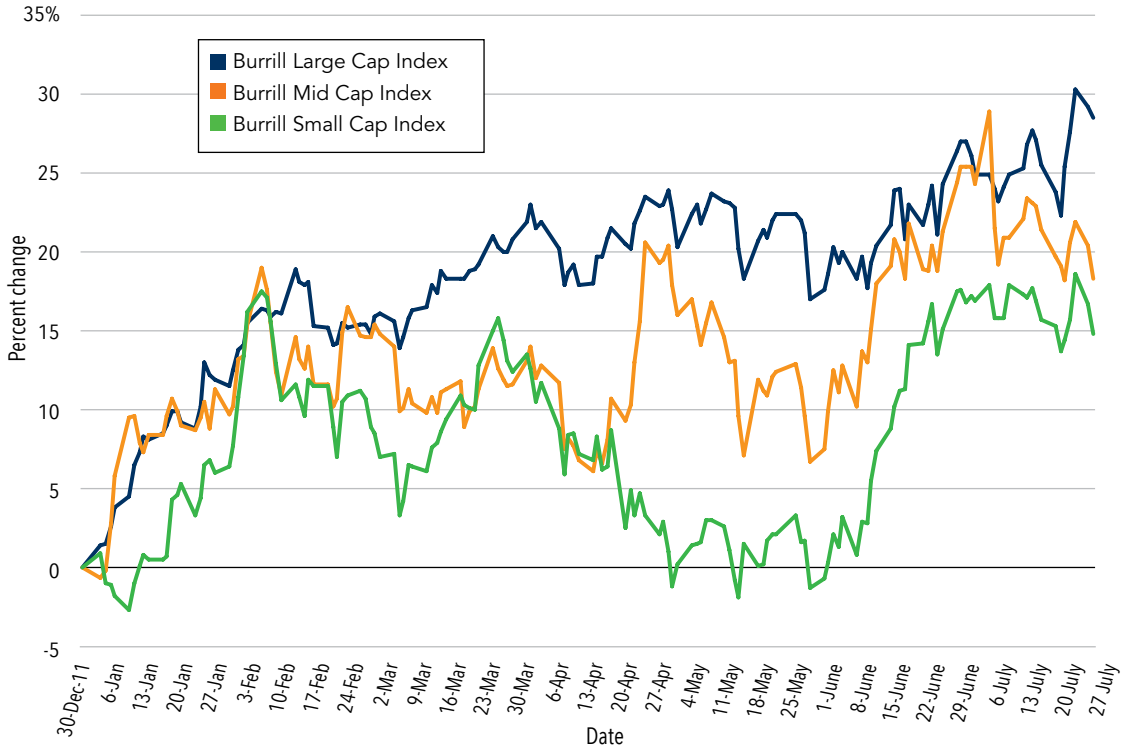
* List only includes New Molecular Entities

Upcoming PDUFA Dates

COMPANY	TICKER	PROPRIETARY NAME	ESTABLISHED NAME	INDICATION	PDUFA DATE
Gilead Sciences	GILD	Quad	elvitegravir, cobicistat, emtricitabine and tenofovir disoproxil fumarate	HIV-1 infection in treatment-naïve adults	8/27/2012
Napo Pharmaceuticals Salix Pharmaceuticals	SLXP Private	Crofelemer	proanthocyanidin	Chronic Diarrhea in HIV/AIDS patients	9/5/2012
Ironwood Pharmaceuticals Forest Laboratories	IRWD NYSE:FRX	N/A	linaclotide	Irritable bowel syndrome with constipation and chronic constipation	9/7/2012
Navidea Biopharmaceuticals	NAVB	Lymphoseek	99m-Tc-Tilmanocept	Imaging agent for lymphatic mapping	9/10/2012
Hyperion Therapeutics	HPTX	Ravicti	glycerol phenylbutyrate	Ulcerative colitis	10/12/2012
ThromboGenics	EBR:THR	N/A	ocriplasmin	Vitreomacular Adhesion	10/17/2012
Impax Laboratories	IPAX	N/A	IPX066	Parkinson's Disease	10/21/2012
United Therapeutics	UTHR	Remodulin	treprostinil sodium	Remodulin	10/26/2012
Cornerstone Therapeutics	CRTX	N/A	lixivaptan	Hyponatremia	10/29/2012
Pfizer	PFE	N/A	tofacitinib	Rheumatoid arthritis	11/20/2012
Medivation Astellas Pharma	Nasdaq:MDVN TSE:4503	N/A	enzalutamide	Castration-resistant prostate cancer	11/22/2012
Exelixis	EXEL	N/A	cabozantinib	Metastatic medullary thyroid cancer	11/29/2012
Human Genome Sciences	HGSI	N/A	raxibacumab	Inhalational anthrax	12/15/2012
Alexza Pharmaceuticals	ALXA	Adasuve	staccato loxapine	agitation associated with schizophrenia or bipolar I disorder	12/21/2012
Biogen Idec	BIIB	N/A	BG-12	Multiple sclerosis	12/28/2012
NPS Pharmaceuticals	NPSP	Gattex	teduglutide	Short bowel syndrome	12/30/2012
NuPathe	PATH	N/A	NP101	migraine	1/17/2013
Sanofi Isis Pharmaceuticals	SNY; ISIS	Kynamro	mipomersen sodium	hypercholesterolemia	1/29/2013
Raptor Pharmaceutical	RPTP	N/A	103	cystinosis	1/30/2013
Celgene	CELG	N/A	pomalidomide	Refractory/relapsed multiple myloma	2/10/2013
Dynavax	DVAX	Heplisav	hepatitis b adult vaccine	Hepatitis B prevention	2/24/2013
Aegerion Pharmaceuticals	AEGR	N/A	lomitapide	Homozygous Familial Hypercholesterolemia	2/28/2013
Santarus	SNTS	Uceris	budesonide	Ulcerative colitis	10/16/2013

INDICES

Burrill Small-, Medium-, and Large-Cap Indices, July 2012



PERFORMANCE OF INDEX COMPONENTS

LARGE CAP
Percent change July 2012

Index	3.4%
REGN	17.9%
AMGN	13.3%
CELG	6.7%
GILD	5.9%
ELN	-20.8%
VRTX	-13.3%
IDXX	-8.3%

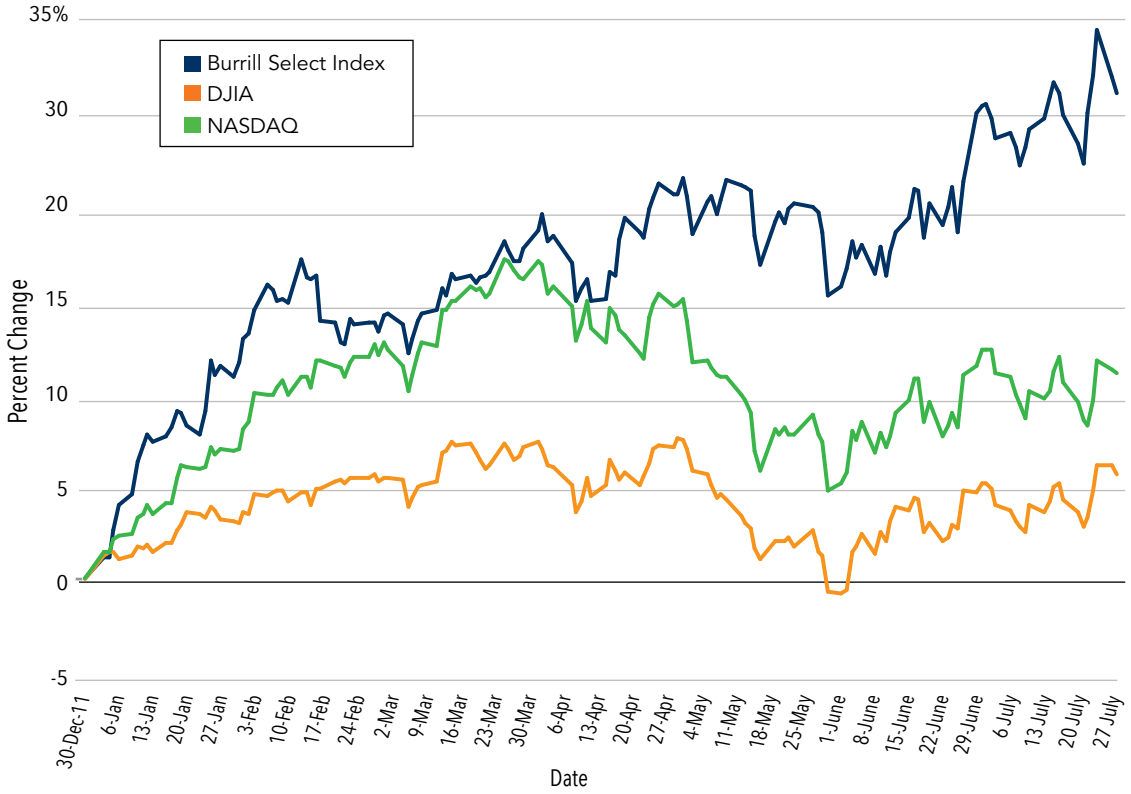
MID-CAP
Percent change July 2012

Index	-2.5%
RIGL	17.6%
EXEL	13.0%
ARIA	11.2%
INCY	10.1%
DNDN	-35.7%
SQNM	-30.8%
QCOR	-30.7%
IMGN	-3.6%

SMALL-CAP
Percent change July 2012

Index	-0.3%
ARRY	48.1%
PSTI	45.4%
SNTA	34.4%
INFI	28.8%
AFFY	26.0%
CHTP	-27.7%
AVNR	-27.0%
PTIE	-21.5%
OSIR	-20.5%

Burrill Biotech Select Index, July 2012

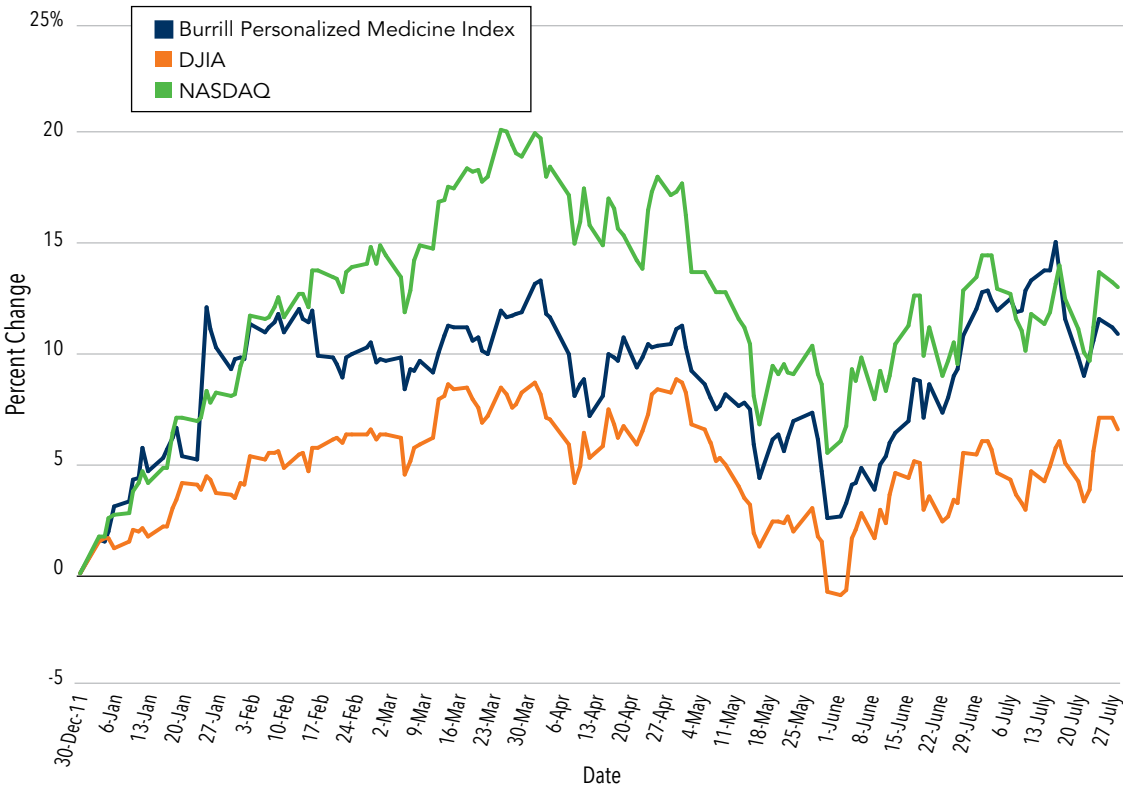


BURRILL BIOTECH SELECT INDEX

Percent change July 2012

Index	4.4%
REGN	17.9%
AMGN	13.3%
EXEL	13.0%
CELG	6.7%
DNDN	-35.7%
VRTX	-13.3%
SGMO	-4.7%

Burrill Personalized Medicine Index, July 2012

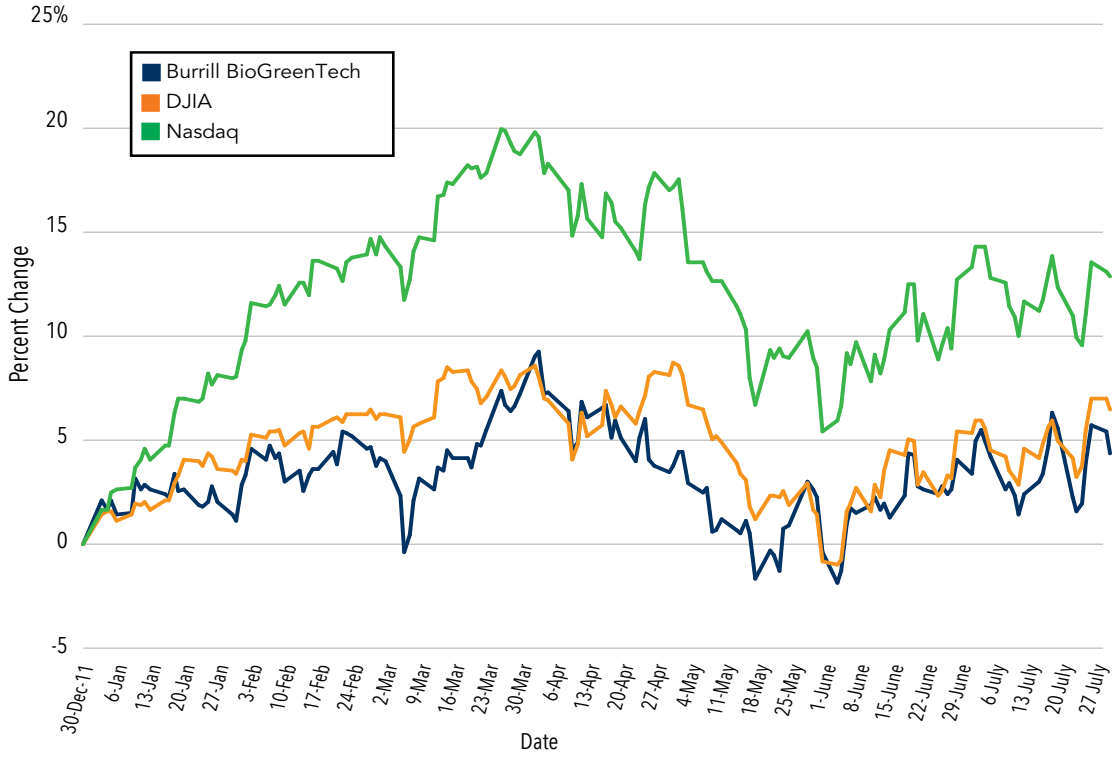


BURRILL PERSONALIZED MEDICINE INDEX

Percent change July 2012

Index	0.1%
GNOM	21.4%
SWX:ROG	5.9%
QGEN	5.4%
PACB	-16.6%
AFFX	-10.7%
LH	-9.2%

Burrill BioGreenTech Index, July 2012

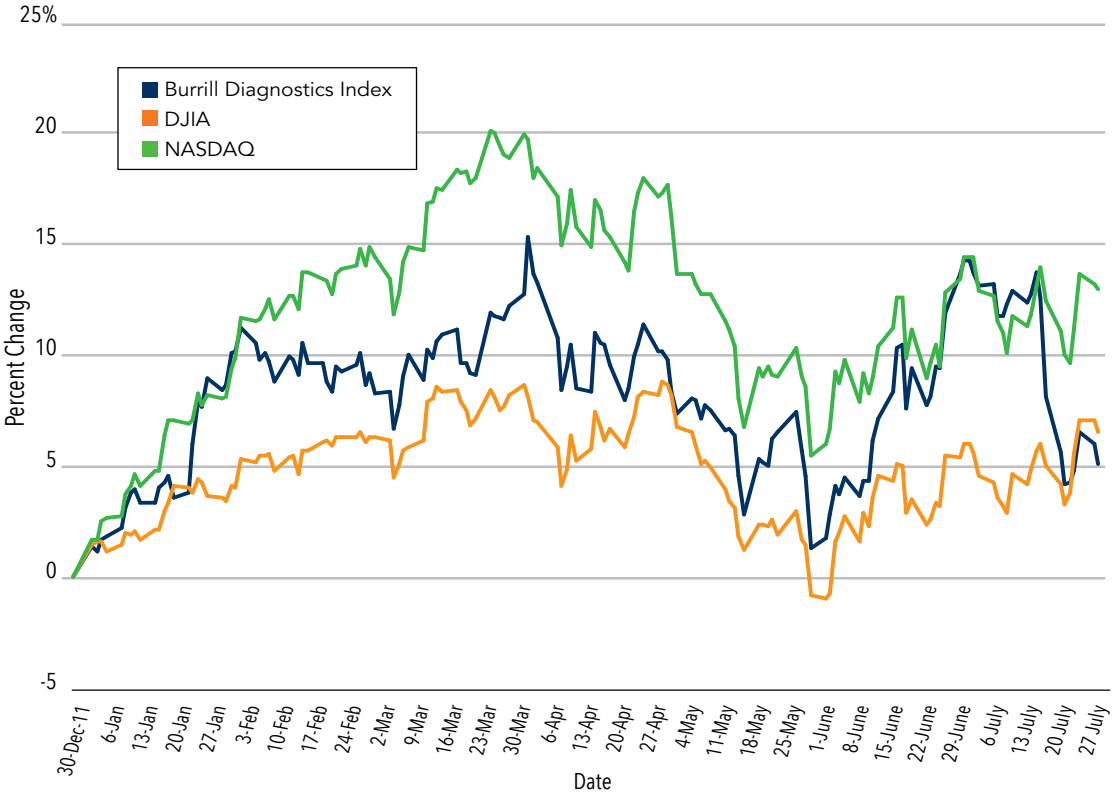


BURRILL BIOGREENTECH INDEX

Percent change July 2012

Index	0.3%
VRNM	40.6%
CERP	17.1%
MON	3.4%
GPRE	-28.8%
GEVO	-21.9%
CDXS	-17.0%
KIOR	-14.6%

Burrill Diagnostics Index, July 2012



BURRILL DIAGNOSTICS INDEX

Percent change July 2012

Index	-6.0%
GNMK	30.2%
QGEN	5.4%
MYGN	4.5%
SQNM	-30.8%
CPHD	-28.2%
LH	-9.2%