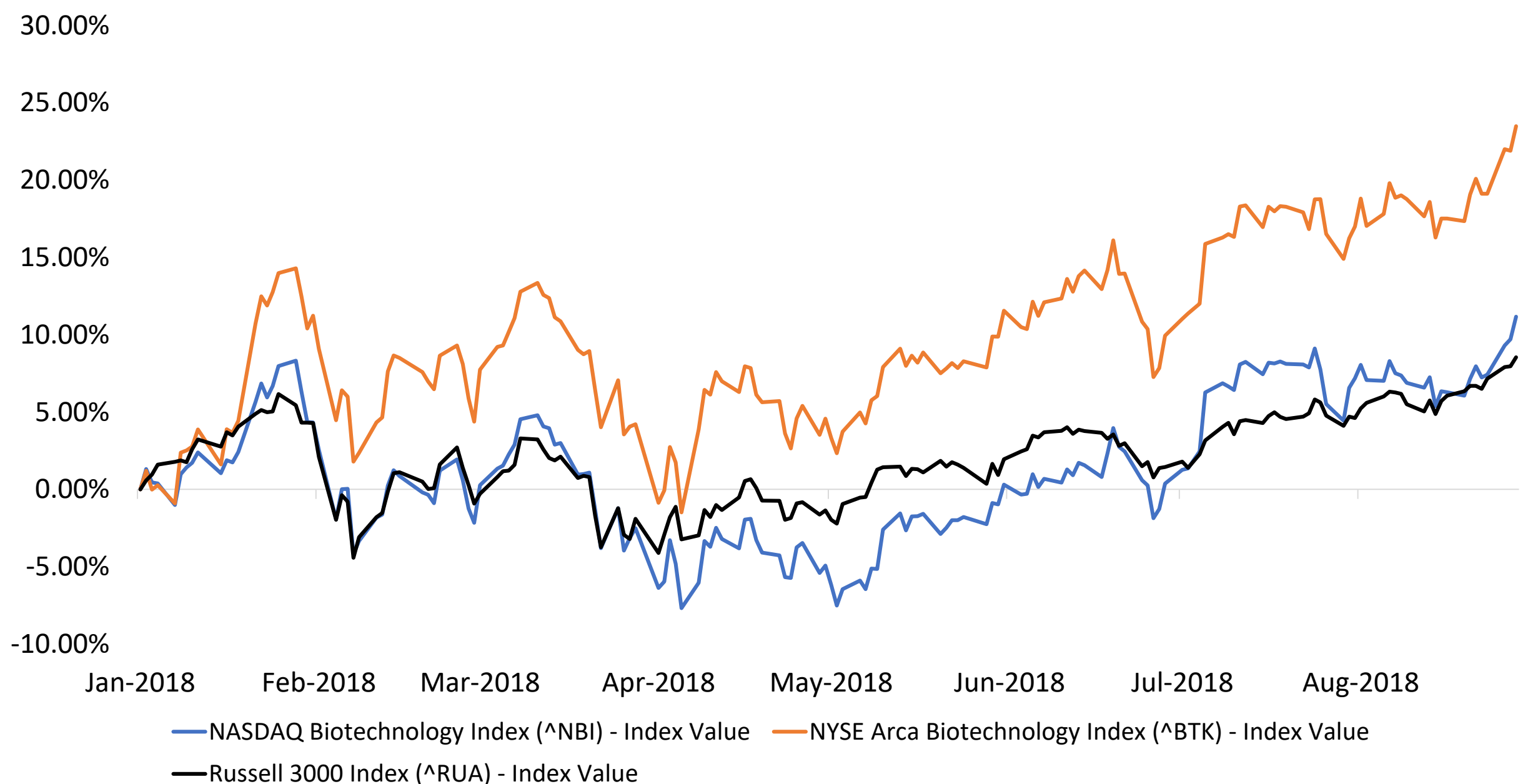


HEALTHCARE SECTOR REVIEW

NOBLE LIFE SCIENCE PARTNERS - BIOTECHNOLOGY INDUSTRY BIWEEKLY

Index Performances: NYSE Arca Biotechnology (BTK, +23.5%) and NASDAQ Biotechnology (NBI, +11.2%) indices outperformed benchmark indices S&P 500 (SP50, +8.1%) and Russell 3000 (RUA, 8.5%) YTD 2018. In the last 2 weeks, NBI and BTK indices soared, climbing +57% and +30% respectively (NBI +7% and BTK +18%, as of August 29).

Biotechnology Relative Price Performance, (As Of 8/29/2018)



Source: Noble Capital Markets, Bloomberg

NOBLE Capital Markets, Inc. is a FINRA registered broker/dealer. Member - SIPC (Securities Investor Protection Corporation).



FINANCING

Biotech financing experienced a weak year in 2017, however capital raised in 1H18 (\$4.6B) has already exceeded the capital raised for the full year 2017 (\$4.2B) (Exhibit 5). Since our last biweekly report, Gristone Oncology announced its plans to go public. The IPO was announced on August 23th. Licensing deals remained flat with 218 deals in 1H18 compared to 216 deals in 1H17 (Exhibit 6). 1H18 showed a strong rebound in M&A activities (Exhibit 7).

FDA APPROVALS

Food and Drug Administration (FDA) approved 46 drugs in 2017 reaching a 22-year high. There have been 33 drug approvals YTD-2018, including Shire (SHPG:NASDAQ)'s Takhzyro™ to treat hereditary angioedema (Exhibit 12).

SELECTED CATALYSTS IN 2H18

Company	Ticker	Drug	Catalyst	Date
ProQR Therapeutics N.V.	PRQR	QR-11	Phase 1/2 Top-Line Results for leber's congenital amaurosis	9/5/2018
Verastem, Inc.	VSTM	Duvelisib (PI3K inhibitor)	PDUFA for NDA for small lymphocytic lymphoma/chronic lymphocytic leukemia (SLL/CLL) and follicular lymphoma (FL)	10/5/2018
Loxo Oncology	LOXO	Larotrectinib (Trk family TKI inhiibtor)	PDUFA for NDA for fusion positive metastatic solid tumors	11/26/2018
Aimmune Therapeutics, Inc.	AIMT	AR101	Phase 3 (RAMSES) readout-Safety and tolerability real world data for peanut allergy	2H18

MICROCAP SPACE SELECTED CATALYST IN 2H18

Company	Ticker	Drug	Catalyst	Date
Actinium Pharmaceuticals, Inc.	ATNM	Actimab-MDS (Cluster of Differentiation 3 (CD3))	Regulatory - Meeting with FDA-Trial Design for Myelodysplastic Syndrome (MDS)	10/5/2018
Galectin Therapeutics, Inc.	GALT	GR-MD-02 (Galectin 3)	Phase 1 w/aOX40 - Trial to Commence for treatment of melanoma	4Q18
Gemphire Therapeutics, Inc.	GEMP	Gemcabene (Apolipoprotein C-III)	Phase 2a FPL - Top-Line Results in NASH	4Q18

Extended catalyst list of biotech companies with market caps of \$50mm to \$300mm can be found on page 28-31.



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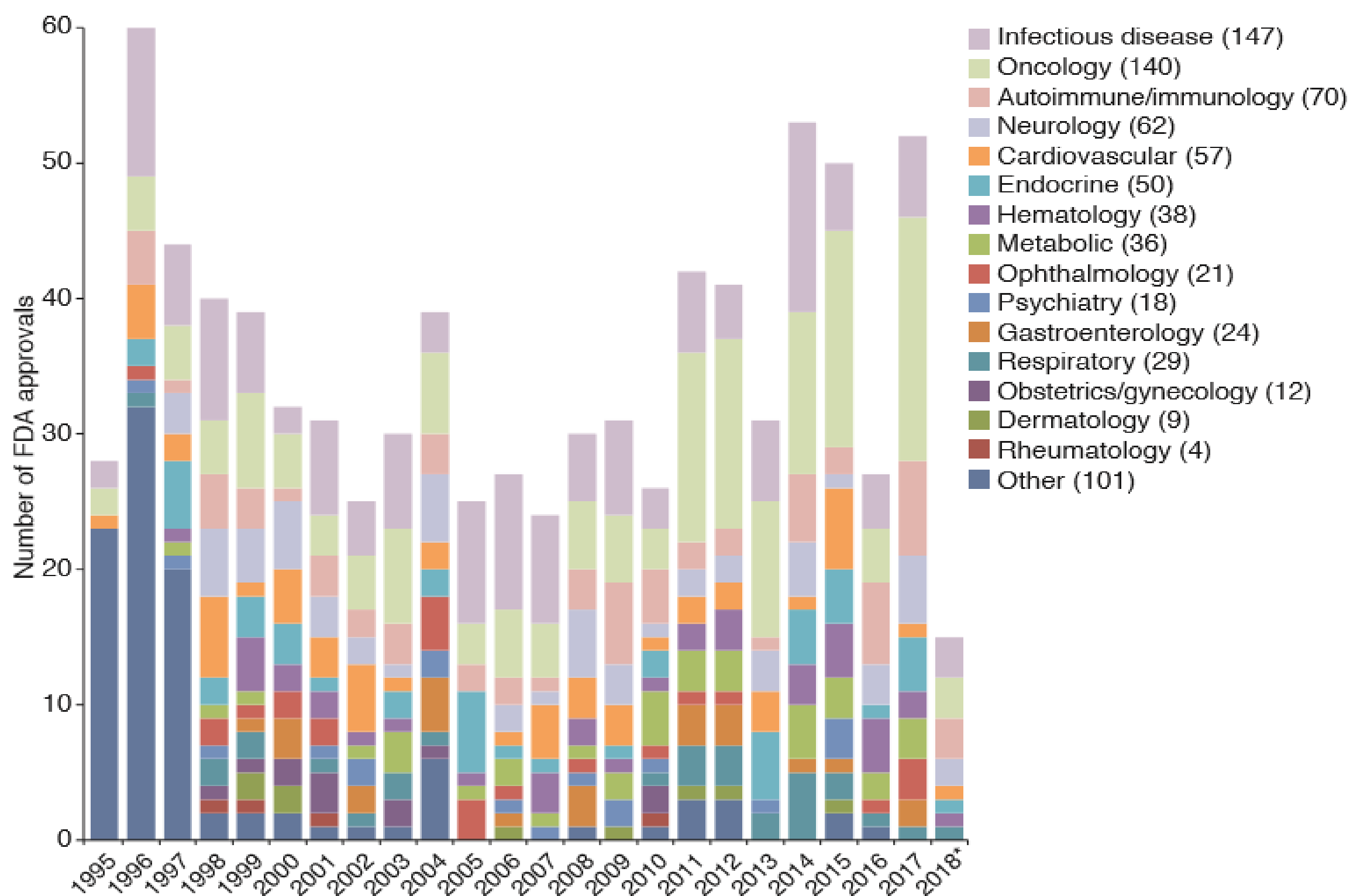
BIOTECH SECTOR TRENDS

Recent News:

- Following its recent deal with bluebird bio (BLUE:NASDAQGS), Gristone Oncology filed an \$80 million IPO with the SEC. Gristone and bluebird bio will collaborate to develop novel cell therapies for the treatment of cancer. bluebird bio brings to the deal deep expertise in gene and cell therapy, whereas Gristone provides its proprietary artificial intelligence technology to identify tumor-specific targets and T-cell receptors directed to these targets. (August 23, 2018)
- Recent scientific [publication](#) in Nature Communications (Volume 9, August 2018), sheds light into the molecular mechanism responsible for melanoma patients' resistance to treatment with tyrosine kinase inhibitors such as Novartis' dabrafenib (Tafinlar®) and Novartis' trametinib (Mekinist®). Dabrafenib and trametinib are inhibitors of the enzymes B-raf and MEK, respectively. B-raf and MEK are two oncogenes known to promote cancer cell proliferation. Acquired genetic mutations of the BRAF oncogene (BRAFFV600E) cause melanoma cancer cells to become resistant to these therapies. Using a method based on CRISPR–Cas9 technology, authors demonstrated that the SIRT6 gene plays a critical role in drug resistance. SIRT6 is a tumor suppressor gene, which cellular presence or expression levels are reduced in cancer cells. The reduced levels of SIRT6 renders cancer cells resistant to treatment with dabrafenib, or combination dabrafenib + trametinib. (August 24, 2018)
- Shire, which was acquired for \$62B by Takeda in 1H18, received final FDA approval for Takhzyro™. Takhzyro™ is a novel drug for the treatment of hereditary angioedema (HAE). Shire continues its domination of the HAE market, with its 3rd drug approval in recent years. HAE medicines, Cinryze® and Firazyr®, were previously launched by Shire. The approval of Takhzyro™ was announced on August 24, 2018.

BIOTECH SECTOR TRENDS

US Drug Approvals By Indication



Note: *1H18 (January 1- June 30)
Source: Nature Biotechnology, Volume 36 Number 8 August 2018

Following record high approval rates in 2017, 2018 started slow in the first half; however we have seen an uptick trend with 13 approvals in July and August. Infectious disease space has the highest number of approvals (147), followed by oncology (140) and autoimmune diseases (70) segments of the sector between the years of 1995 -2018.



BIOTECH SECTOR TRENDS

Cancer Immunotherapy-CD47 As A Novel Target in Cancer Therapeutics

Drug	Company	Ticker	Description	Stage
ALX148	ALX Oncology	Private	SIRP α -Fc fusion protein (inactive Fc)	Phase 1
CC-90002	Celgene	CELG	Humanized anti-CD47 antibody (IgG4)	Phase 1
Hu5F9-G4	Forty Seven	FTSV	Humanized anti-CD47 antibody (IgG4)	Phase 2
SRF231	Surface Oncology	SURF	Fully human anti-CD47 antibody (IgG4)	Phase 1
TTI-621	Trillium Therapeutics	TRIL	SIRP α -Fc fusion protein (IgG1)	Phase 1
TTI-622	Trillium Therapeutics	TRIL	SIRP α -Fc fusion protein (IgG4)	Phase 1

Source: Adapted from Weiskopf, K. *Eur. J. Cancer* 76, 100–109, 2017

Over the last decade, cancer immunotherapy has emerged as one of the most promising class of medicines for the treatment of cancer. Deemed by experts as a potential cure, significant challenges remain for the clinical development of this drug class. The majority of current therapies focuses on adaptive immune mechanism (most evolutionary advanced part of the immune system including antibody-producing cells), whereas less attention has been given to the innate immune system (first line of defense). The innate immune system includes natural killer cells, antigen presenting cells (macrophages and dendric cells) and myeloid cells, which constitutes the first barrier of immune protection.



BIOTECH SECTOR TRENDS

Cancer Immunotherapy-CD47 As A Novel Target in Cancer Therapeutics (Continued)

CD47, Phagocytosis and Killing Cancer Cells

- One critical functions of the innate immune system is phagocytosis. Phagocytosis is a cellular function consisting of ingestion and destruction of particles (such as microbes, parasites and cancer cells).
- Cells of the innate immune system such as macrophages are capable of phagocytosis, and as such, can “eat” (ingest) and destroy cancer cells.
- CD47 is an important regulator of myeloid cell activation, which is critical for the innate immune response. The CD47 protein functions as a “Do Not Eat Me” signal. Cancer cells express this signal on the surface to avoid and escape the innate immune response. Cancer cells express very high levels of CD47, much higher than levels found in normal cells. This feature makes the CD47 protein a potential target for the treatment of cancer.
- Inhibition of the CD47 protein rescues the phagocytic function of macrophages and other cells of the innate immune system, which are now able to “Eat” and destroy cancer cells.

At present, there are various therapeutic agents in clinical development targeting CD47 for the treatment of cancer including: ALX Oncology (Private), Celgene (CELG: NASDAQGS, Market Cap \$64B), Forty Seven (FTSV:NASDAQGS, Market Cap \$470M), Surface Oncology (SURF:NASDAQGM, Market Cap \$245M) and Trillium Therapeutics (TRIL:TSX, Market Cap \$82M).

Forty Seven is the front runner company in the space. Forty Seven is currently conducting a Phase 2 clinical trial on the use of Hu5F9-G4 in combination with Roche’s Rituximab (anti-CD20) for the treatment of acute myeloid leukemia (AML). Forty Seven is also developing this candidate medicine in combination with Eli Lilly’s Cetuximab (anti-EGFR) for the treatment of colorectal cancer. Forty Seven’s management plans to evaluate the drug as a monotherapy and combination with other anti-cancer medicines for the treatment of various solid tumors and hematological malignancies. Single agent clinical activity was observed in 2 out of 21 heavily pre-treated ovarian cancer patients (10% overall response rate, ORR), and 7 out of 18 refractory AML patients (38% patients with reduced leukemic blast). Combination with Cetuximab in colorectal cancer patient demonstrated 9% ORR and with Rituximab in refractory and relapsed non-Hodgkin’s lymphoma (R/R NHL) 47% ORR. Approximately 200 patients were treated with Hu5F9-G4 and showed a tolerable safety profile despite concerns of hemagglutination (clumping of red blood cells) in the preclinical setting. Like Forty Seven, ALX Oncology is another Stanford spin off. ALX is currently evaluating the use of ALX148 in combination with Merck’s Keytruda®, Roche’s Rituximab and Genentech’s Trastuzumab for the treatment of patients with advanced solid tumors and lymphoma.

Celgene is assessing CC-90002 in patients with acute myeloid leukemia (AML) and high-risk myelodysplastic syndrome (MDS), whereas Surface and Trillium are testing SRF231 and TTI-621/TTI-622, respectively, in monotherapy and combination with PD/PDL1 and anti-CD20 agents for the treatment of patients with advanced solid and hematologic cancers. Data readouts from Forty Seven’s Phase 2 clinical studies (in colorectal cancer and NHL) are anticipated in 2019.

BIOTECH SECTOR TRENDS

Hereditary Angioedema (HAE)- Shire's (SHPG:NASDAQ) Continuing Dominance

HAE is a potentially life threatening genetic disorder. This rare disease is characterized by episodes of edema (swelling) in various parts of the body including hands, feet and face. It affects 1 in 10 to 15,000 people. An estimated 25% of HAE patients carry mutations in the C1 inhibitor blood protein. The majority of candidate drugs in clinical development target the C1 inhibitor gene and the plasma kallikrein-kinin system (KKS) components. There are currently six approved treatments, three of which belong to Shire:

1. Takhzyro™ (Ivanidecimab, plasma kallikrein inhibitor, approved on August 23rd, 2018),
2. Cinryze® (C1 esterase inhibitor, approved in 2008) and
3. Firazyr® (Bradykinin B2 Receptor antagonist, approved in 2011). On June 21, 2018, FDA also approved Cinryze™ (label extension) for the prevention of HAE attacks in children 6 years and older.

Shire reported F2017 annual product sales in HAE of \$1,429.6 million (+9% compared to 2016), primarily driven by Firazyr®, up 15% to \$663.0 million, and Cinryze® up 3% to \$699.3 million. HAE product sales were reported to be up 9% and 5% in the three and six months, respectively compared to 2017 (year over year).

Takhzyro™ is an injectable monoclonal antibody targeting plasma kallikrein (Pkal), approved to prevent HAE attacks. The FDA approval was granted based on a Phase 3 pivotal study of Takhzyro™ (300 mg every 2 weeks). In the study, patients showed an 87% reduction in mean monthly attacks compared to placebo arm ((0.26 vs. 1.97, n=27 vs. n=41). Shire acquired the rights to Takhzyro™ through the acquisition of Dyax Corp in 2016.

Other approved HAE drugs include:

- CSL Limited's C1 esterase inhibitors Berinert® and
- Haegarda and Pharming Group N. V.'s C1 esterase inhibitor Ruconest®.

Early Stage Development Of HAE

Drug	Company	Ticker	Description	Stage
ATN-249	Attune Pharmaceuticals	Private	Plasma Kallikrein Inhibitor	Phase 1
BCX7353	BioCryst Pharmaceuticals, Inc.	BCRX	Plasma Kallikrein Inhibitor	Phase 3
IONIS-PKRx	Ionis Pharmaceuticals, Inc.	IONS	RNA-based antisense	Phase 1
IONIS-PKK-LRx				
KVD818	KalVista Pharmaceuticals	KALV	Plasma Kallikrein Inhibitor	Phase 1
KVD900				

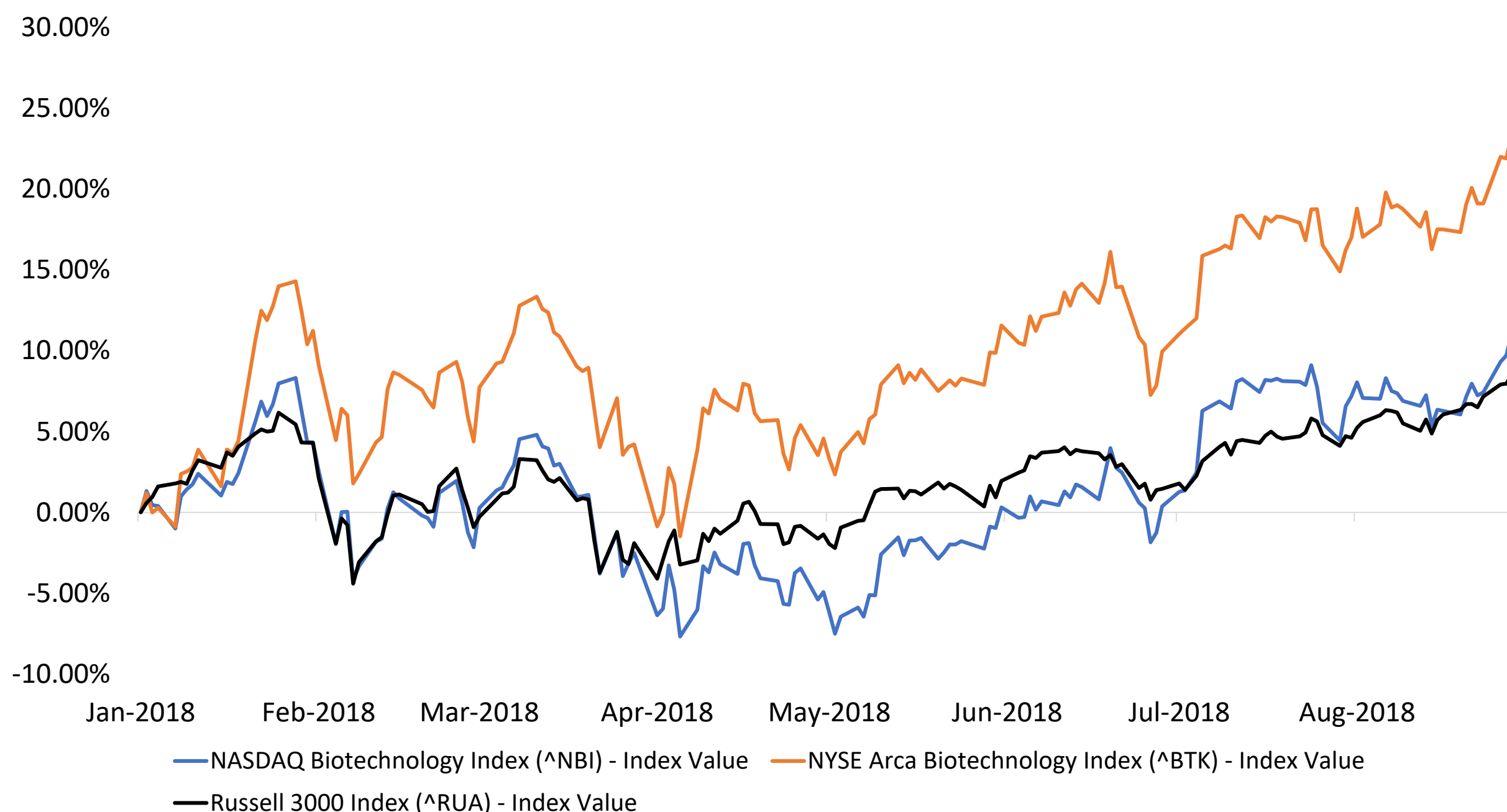
Source: BioMed tracker, Noble Life Science Partners.

Up and coming products in HAE landscape

- Biocryst Pharmaceuticals (BCRX:NASDAQGS) is currently in Phase 3 clinical trials assessing oral BCX7353 for the prevention of HAE. BCX7353 (125 mg) reduced HAE attacks by 73% compared to placebo (p<0.001), Phase 2 (APeX-1) data released in 2017. Phase 3 trial is currently underway.
- Ionis Pharmaceuticals (IONS:NASDAQGS) is testing RNA-based IONIS-PKRx and IONIS-PKK-LRx antisense drugs, which are designed to reduce the production of prekallikrein, or PKK.
- Kalvista Pharmaceuticals (KALV:NASDAQGM) is also assessing two oral plasma kallikrein inhibitors KVD818 and KVD900 in a Phase 1 clinical setting. Company is anticipated to commence a Phase 2 study to treat acute attacks of HAE with KVD900 in 2018.
- Attune Pharmaceuticals (Private) is developing an oral small molecule inhibitor ATN-249 targeting plasma kallikrein.

MARKET DYNAMICS

Exhibit 1: Biotechnology Relative Price Performance, (As Of 8/29/2018)

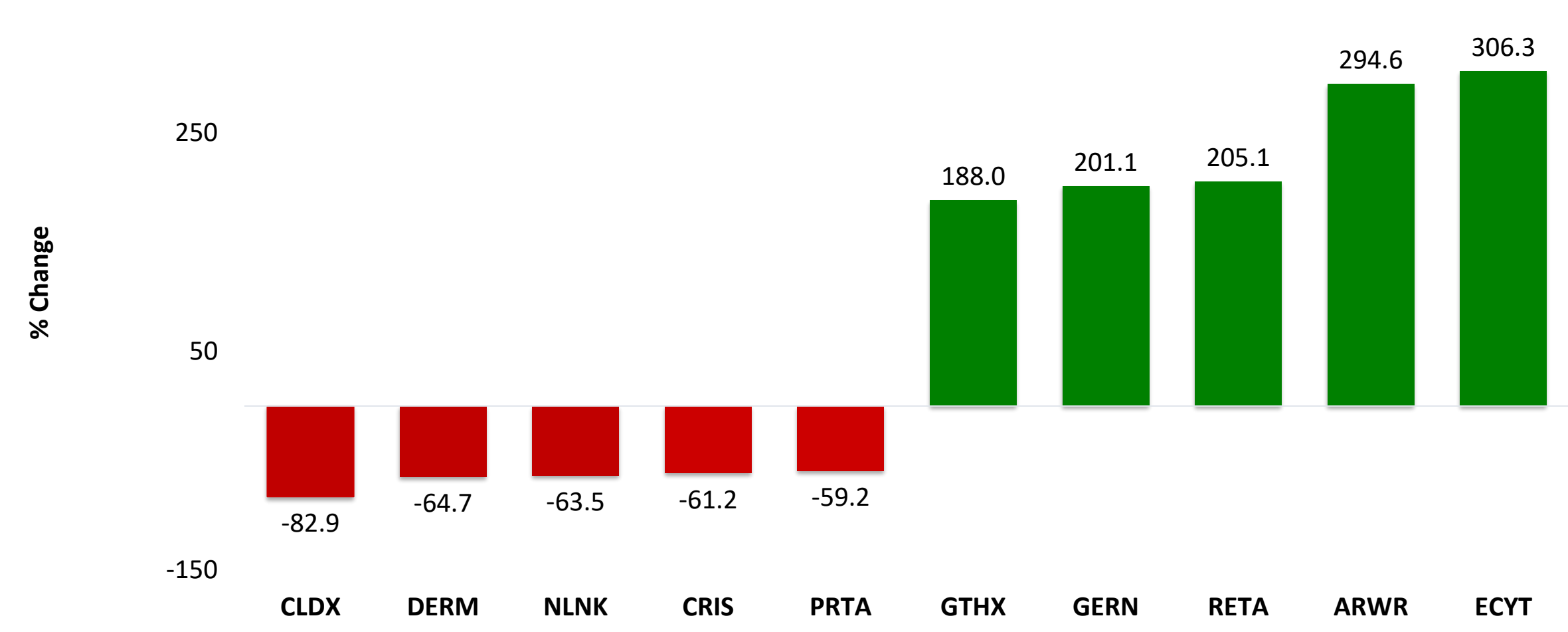


Source: Noble Capital Markets, Bloomberg

Performance on a 12-month trailing basis is skewed toward the relatively larger capitalization universe found in the BTK index (+23%), which is also an index of 30 stocks compared to the 100+ components in the NBI (+11%). Notable stock price performances in the BTK (in alphabetical order) include Bio-Techne (TECH, +46%), Illumina (ILMN, +57%), Intercept Pharmaceutical (ICPT, +94%), Neurocrine Biosciences (NBIX, +53%), and Ultragenyx (RARE, +70%).

MARKET DYNAMICS

Exhibit 2: Top/Bottom 5 Small Cap Stock Performance, YTD 2018 (As Of 8/29/2018)

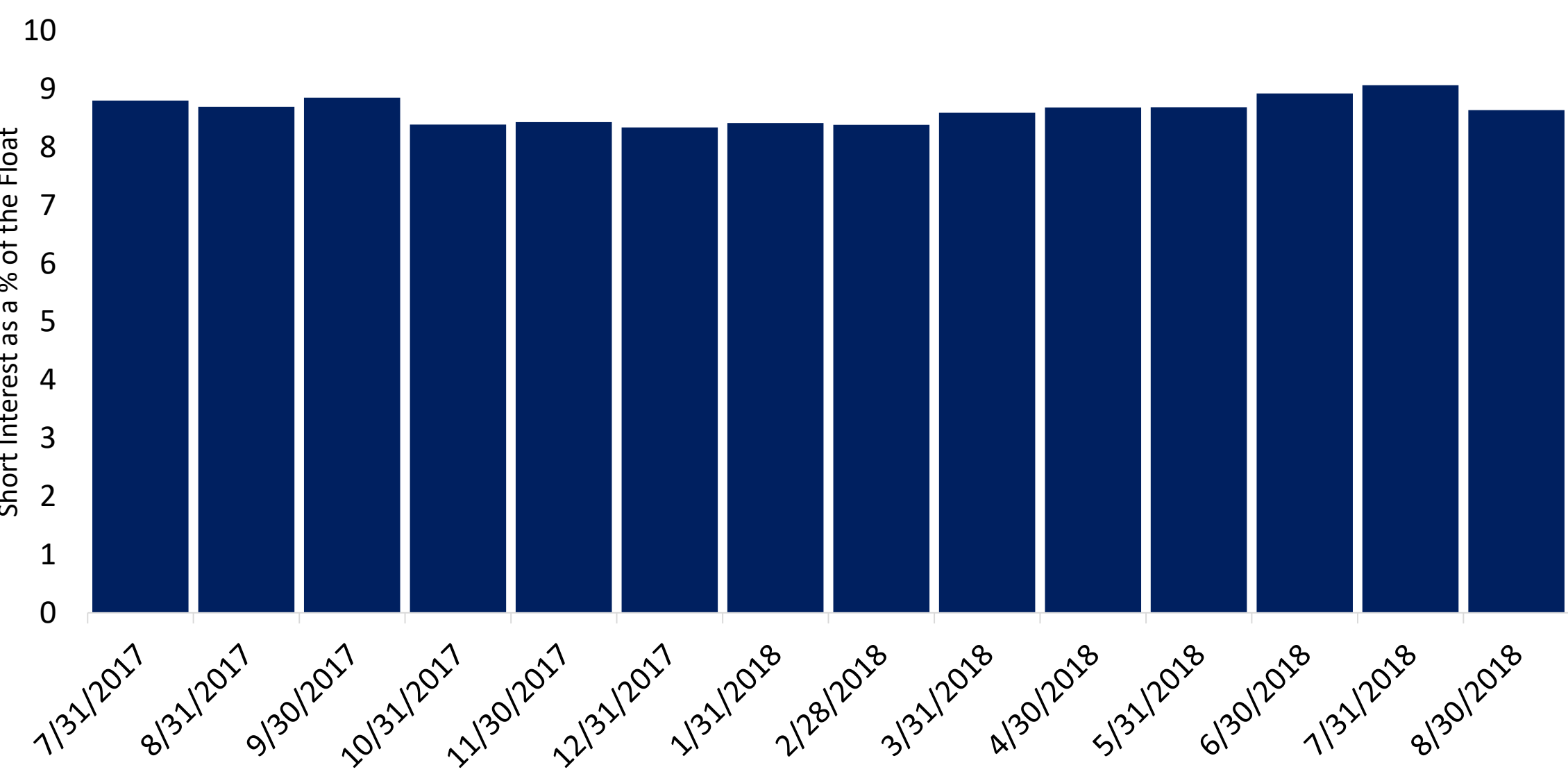


Source: Noble Capital Markets, Bloomberg

Top stock performers of NBI index include G1 Therapeutics (GTHX, +188.0%), Geron (GERN, +201.1%), Reata Pharmaceuticals (RETA, +205.1%) Arrowhead (ARWR, +294.6%) and Endocyte (ECYT, +306.3%); bottom performers include Celldex Therapeutics (CLDX, -82.9%), Dermira (DERM, -64.7%), NewLink Genetics (NLNK, -63.5%), Curis (CRIS, -84.5%) and Prothena (PRTA, -73.4%).

MARKET DYNAMICS

Exhibit 3: Biotechnology Short Interest % Of Float, As Of 8/30/18



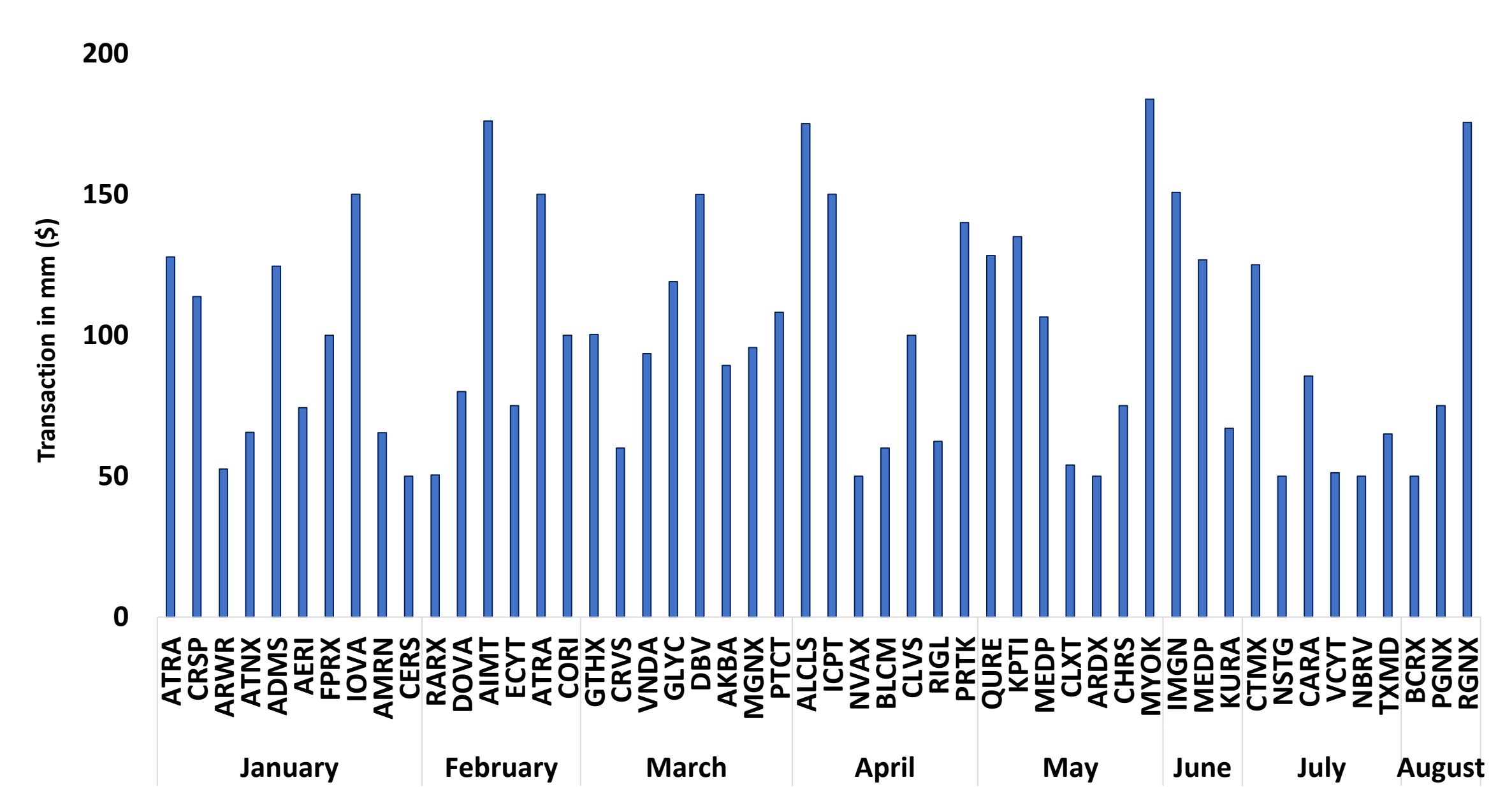
Source: Noble Capital Markets, Capital IQ

Stocks with highest short interest of percent float are PetIQ Inc. (PETQ), AMAG Pharmaceuticals Inc. (AMAG), Geron Corporation (GERN).



MARKET DYNAMICS - FINANCING

Exhibit 4: YTD Biotech Financings, As Of 08/28/2018



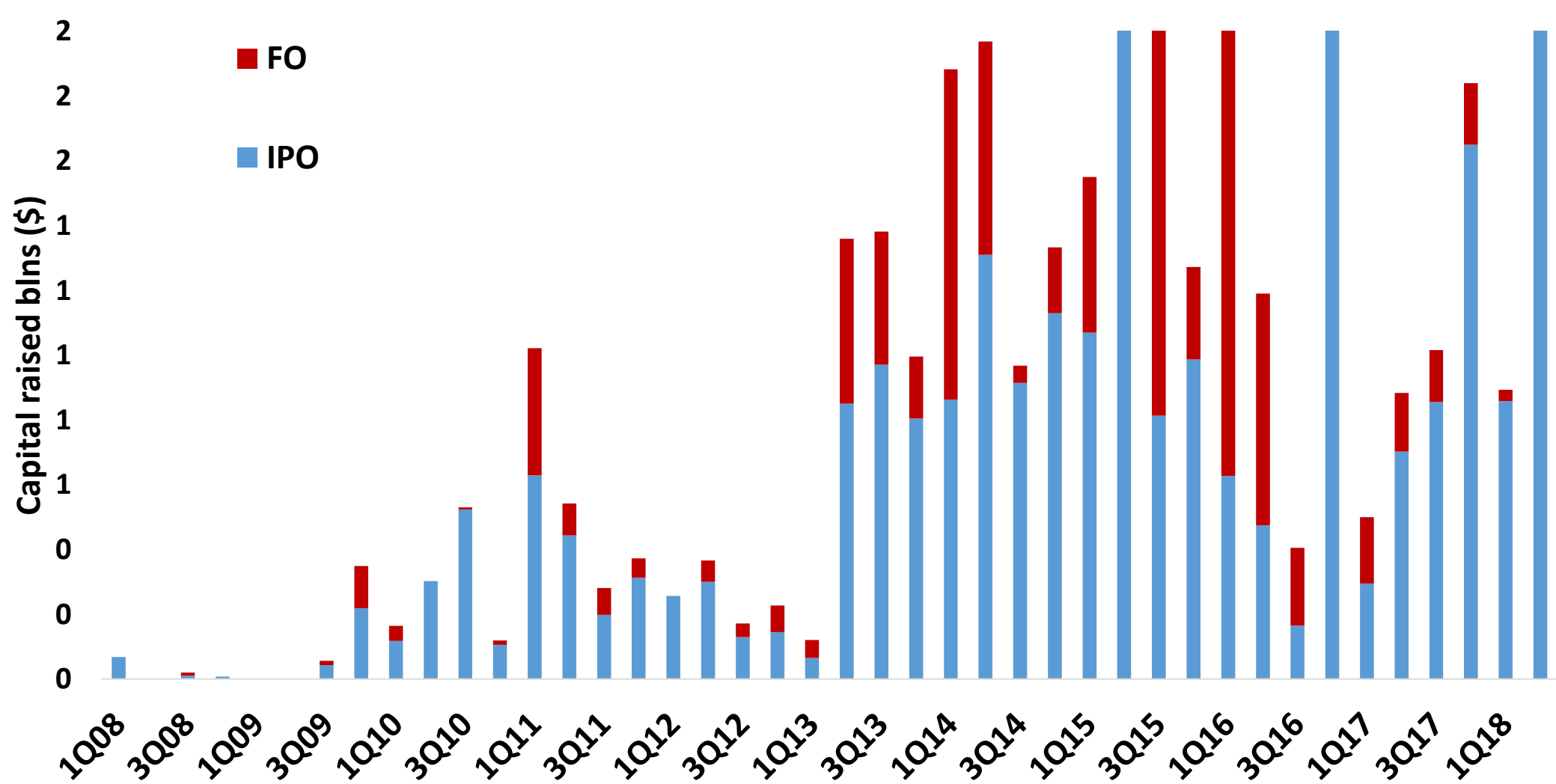
Source: Noble Capital Markets, Capital IQ

In 48 transactions ranging from \$50-\$200 mm in YTD 2018, 48% raised more than \$100 mm. The largest transactions include MyoKardia Inc. (MYOK:NASDAQGS, \$184mm), Aimmune Therapeutics (AIMT:NASDAQGS, \$176mm), and Regenbio Inc. (RGNX:NASDAQGS, \$175.5 mm).



MARKET DYNAMICS – FINANCING

Exhibit 5: Biotech Financings—IPO And Follow-On Capital Raised By Quarter

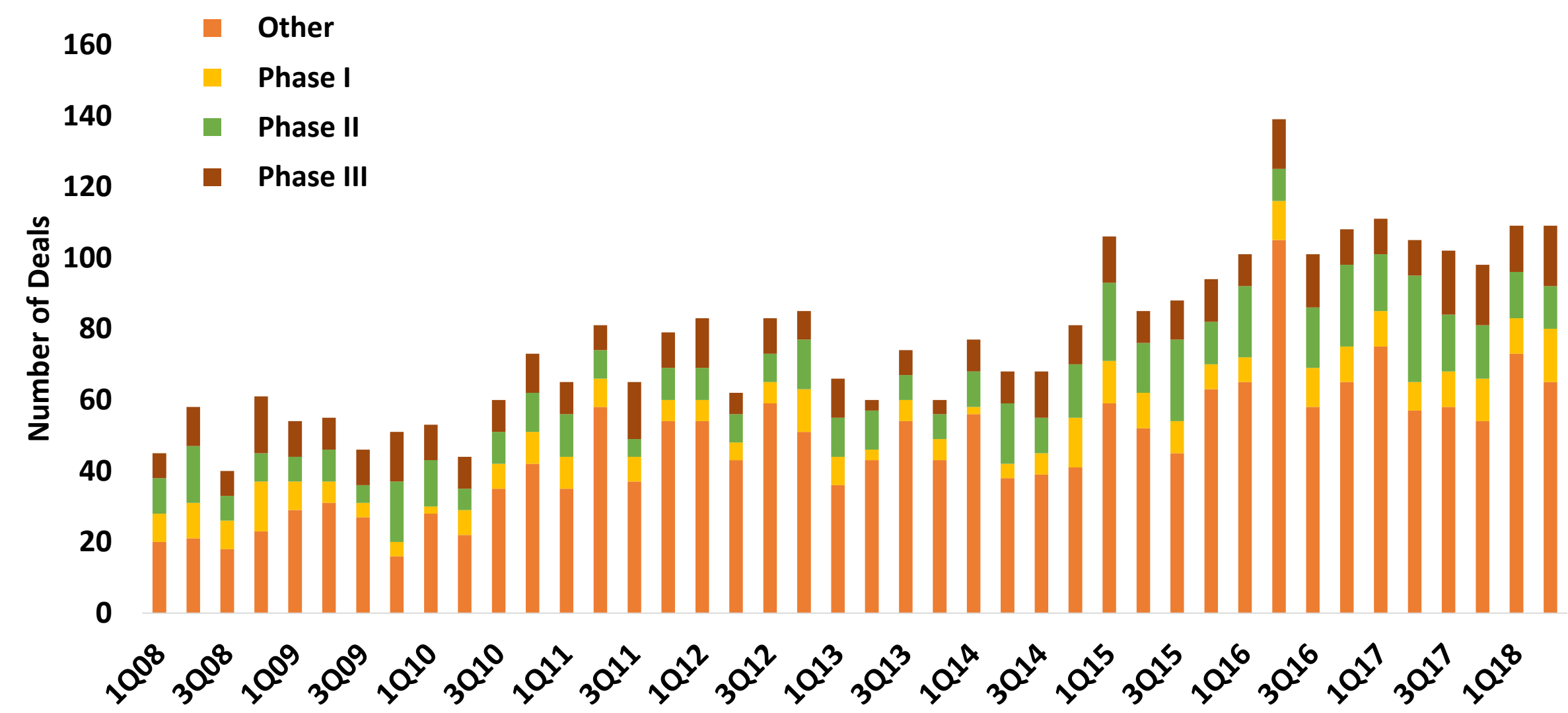


Source: Noble Capital Markets, Bloomberg

Biotech financings decreased (-132%) a year-over-year basis in 2017 versus 2016, however we see an upside trend in 1H18 with \$4.6B exceeding the total capital raised in the whole year (\$4.24B) of 2017.

MARKET DYNAMICS – FINANCING

Exhibit 6: Biotech Licensing Deals

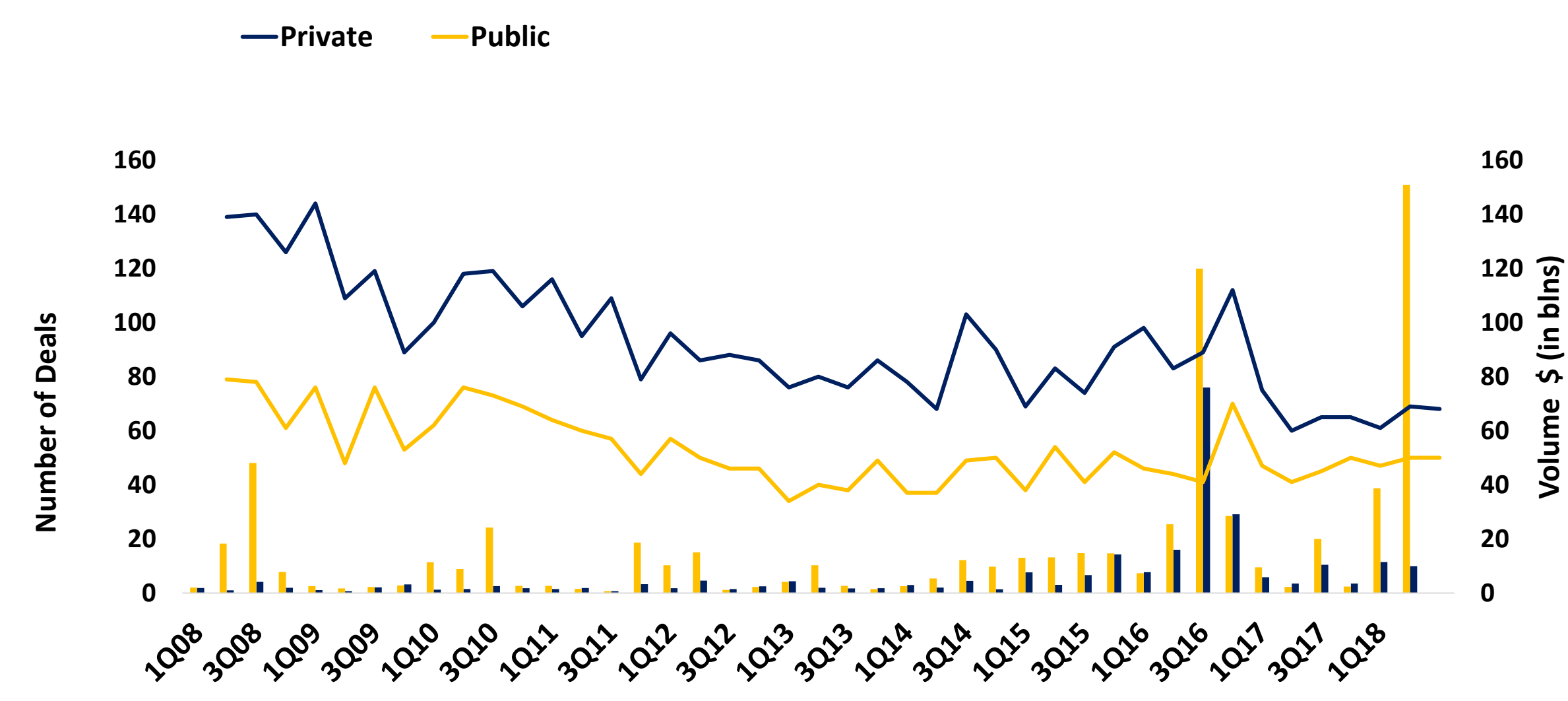


Source: Noble Capital Markets, Bloomberg

Total licensing deals were up 11% in 2016, while remained flat in 2017 compared to 2016. The flat trend continues with 218 deals in 1H18 versus 216 deals in 1H17.

MARKET DYNAMICS – FINANCING

Exhibit 7: Biotech M&A Deals



Source: Noble Capital Markets, Bloomberg

The public M&A deal volume peaked in 2Q18 demonstrating +25%, while the private deals showed a downward trend (-87%) decrease compared to the highest quarter of 3Q16.

Lock-Up Expirations

Exhibit 8: IPO And Follow-On Lock-Up Expiration Data For 2018

Company Name	Ticker	Offer Type	Offer Size (M)	Lock-up Exp. Date	Restricted shares
Deciphera Pharmaceuticals Inc	DCPH	Follow-on	197.8	09/05/2018	N/A
Viking Therapeutics Inc	VKTX	Follow-on	77.6	09/05/2018	N/A
ADMA Biologics Inc	ADMA	Follow-on	40.0	09/06/2018	N/A
Bluebird Bio Inc	BLUE	Follow-on	632.5	09/08/2018	N/A
Arcus Biosciences Inc	RCUS	IPO	138.0	09/11/2018	35.3
Immunomedics Inc	IMMU	Follow-on	276.0	09/11/2018	N/A
CytomX Therapeutics Inc	CTMX	Follow-on	143.7	09/11/2018	N/A
Achieve Life Sciences Inc	ACHV	Follow-on	4.5	09/13/2018	N/A
iBio Inc	IBIO	Follow-on	3.9	09/20/2018	N/A
Homology Medicines Inc	FIXX	IPO	165.6	09/24/2018	27.1
Aerpio Pharmaceuticals Inc	ARPO	Follow-on	45.0	09/24/2018	N/A
Unum Therapeutics Inc	UMRX	IPO	69.2	09/25/2018	N/A
ArQule Inc	ARQL	Follow-on	69.6	10/09/2018	N/A
SELLAS Life Sciences Group Inc	SLS	Follow-on	14.4	10/10/2018	N/A
Assembly Biosciences Inc	ASMB	Follow-on	165.6	10/10/2018	N/A
Oragenics Inc	OGEN	Follow-on	3.0	10/11/2018	N/A
Surface Oncology Inc	SURF	IPO	108.0	10/16/2018	N/A
Cara Therapeutics Inc	CARA	Follow-on	98.3	10/17/2018	N/A
Veracyte Inc	VCYT	Follow-on	58.9	10/24/2018	N/A
Savara Inc	SVRA	Follow-on	48.9	10/24/2018	N/A
Cellectar Biosciences Inc	CLRB	Follow-on	16.6	10/25/2018	N/A
ContraFect Corp	CFRX	Follow-on	10.0	10/25/2018	N/A
UNITY Biotechnology Inc	UBX	IPO	85.0	10/30/2018	36.9
Evelo Biosciences Inc	EVLO	IPO	85.0	11/05/2018	N/A
Kiniksa Pharmaceuticals Ltd	KNSA	IPO	170.7	11/20/2018	N/A
Scholar Rock Holding Corp	SRRK	IPO	86.3	11/20/2018	19.1
Iterum Therapeutics plc	ITRM	IPO	80.0	11/21/2018	7.72
Trovagene Inc	TROV	Follow-on	9.1	12/05/2018	N/A
MeiraGTx Holdings plc	MGTX	IPO	75.0	12/05/2018	22.2
Eidos Therapeutics Inc	EIDX	IPO	122.2	12/17/2018	24.2
Aptinyx Inc	APTX	IPO	117.8	12/18/2018	N/A
Magenta Therapeutics Inc	MGTA	IPO	100.0	12/18/2018	N/A
Kezar Life Sciences Inc	KZR	IPO	86.3	12/18/2018	12.3
AvroBio Inc	AVRO	IPO	114.7	12/18/2018	N/A
ElectroCore LLC	ECOR	IPO	89.7	12/19/2018	23
Neon Therapeutics Inc	NTGN	IPO	100.0	12/24/2018	N/A
Translate Bio Inc	TBIO	IPO	126.3	12/25/2018	35.4
Forty Seven Inc	FTSV	IPO	112.6	12/25/2018	N/A
Rubius Therapeutics Inc	RUBY	IPO	277.3	01/14/2019	66.9
Crinetics Pharmaceuticals Inc	CRNX	IPO	117.3	01/14/2019	17.0
Allakos Inc	ALLK	IPO	147.7	01/15/2019	33.7
Constellation Pharmaceuticals	CNST	IPO	60.0	01/15/2019	21.7
Replimune Group Inc	REPL	IPO	100.5	01/16/2019	24.1
Provention Bio Inc	PRVB	IPO	63.9	01/20/2019	11.4
Liquidia Technologies Inc	LQDA	IPO	50.0	01/22/2019	10.6
Adial Pharmaceuticals Inc	ADIL	IPO	7.3	01/23/2019	5.1

Source: Noble Capital Markets, Bloomberg

SELECTED INDUSTRY CONFERENCES

Exhibit 9: Medical, Scientific And Industry Conferences For 2018

Event	Start Date	End Date	Location
September			
American Heart Association (AHA) Council on Hypertension Scientific Sessions	9/6/2018	9/9/2018	Chicago, IL
BioCentury: Newsmakers in the Biotech Industry	9/7/2018	9/7/2018	New York, NY
ECCO - European Cancer Summit	9/7/2018	9/9/2018	Vienna, Austria
Nordic Life Science Days	9/10/2018	9/12/2018	Malmo, Sweden
The Retina Society Annual Scientific Meeting	9/12/2018	9/15/2018	San Francisco, CA
IASP - International Association for the Study of Pain - World Congress on Pain	9/12/2018	9/16/2018	Boston, MA
HFSA - Heart Failure Society of America - Annual Scientific Meeting	9/15/2018	9/18/2018	Nashville, TN
ERS International Congress	9/15/2018	9/19/2018	Paris, France
HFSA - The Heart Failure Society Annual Meeting	9/15/2018	9/18/2018	Nashville, Tennessee
World Conference on Lung Cancer (WCLC)	9/23/2018	9/26/2018	Toronto, Canada
ASTRO - American Society for Radiation Oncology - Annual Meeting	9/24/2018	9/27/2018	San Diego, CA
Discovery on Target (CHI)	9/25/2018	9/28/2018	Boston, MA
October			
EASD Diabetes Meeting	10/1/2018	10/5/2018	Berlin, Germany
IDWeek - Infectious Disease Week	10/3/2018	10/7/2018	San Francisco, CA
International Parkinson and Movement Disorder Society	10/5/2018	10/9/2018	Hong Kong, China
ACG - American College of Gastroenterology - World Congress	10/5/2018	10/10/2018	Philadelphia, PN
ACCP - American College of Chest Physicians (CHEST)	10/6/2018	10/10/2018	San Antonio, TX
HCV - International Symposium on Hepatitis C Virus and Related Viruses	10/8/2018	10/11/2018	Dublin, Ireland
ECTRIMS - European Committee for Treatment and Research in Multiple Sclerosis - Congress	10/10/2018	10/12/2018	Berlin, Germany
Annual Digital Healthcare Innovation Summit	10/11/2018	10/11/2018	Boston, MA
American Society of Dermatological Surgery	10/11/2018	10/14/2018	Phoenix, Arizona
ESGCT - European Society of Gene & Cell Therapy - Annual Congress	10/16/2018	10/19/2018	Lausanne, Switzerland
ASHG - American Society of Human Genetics - Annual Meeting	10/16/2018	10/20/2018	San Diego, CA
Australian Microcap Investment Conference	10/17/2018	10/18/2018	Melbourne, Australia
Annual BIO Investor Forum	10/17/2018	10/18/2018	San Francisco, CA
North American Cystic Fibrosis Conference	10/18/2018	10/20/2018	Colorado, CO
ESMO - European Society for Medical Oncology	10/19/2018	10/23/2018	Munich, Germany
ACR/ARHP - American College of Rheumatology Annual Meeting	10/19/2018	10/24/2018	Chicago, IL
UEG Week Vienna 2018	10/20/2018	10/24/2018	Vienna, Austria
ANA - American Neurological Association - Annual Meeting	10/21/2018	10/23/2018	Atlanta, GA
Life Sciences Summit	10/24/2018	10/25/2018	New York, NY
Society of Melanoma Research	10/24/2018	10/27/2018	Manshester, England
Ophthalmology Innovation Summit - AAO	10/25/2018	10/25/2018	Chicago, IL
ASN - American Society of Nephrology Kidney Week	10/25/2018	10/28/2018	San Diego, CA
AAO - American Academy of Ophthalmology - Annual Meeting	10/27/2018	10/30/2018	Chicago, IL
World Vaccine Congress Europe	10/29/2018	10/31/2018	Lisbon, Portugal

Note: Major conferences are shown in bold.

Source: Noble Capital Markets, Biomed Tracker

SELECTED INDUSTRY CONFERENCES

Exhibit 9: Medical, Scientific And Industry Conferences For 2018 (Continued)

Event	Start Date	End Date	Location
November			
AMP - Association for Molecular Pathology - Annual Meeting	11/1/2018	11/3/2018	San Antonio, TX
SfN - Society for Neuroscience - Annual Meeting	11/3/2018	11/7/2018	San Diego, CA
AAPS - American Association of Pharmaceutical Scientists - PharmSci 360	11/4/2018	11/7/2018	Washington, DC
World Orphan Drug Congress Europe	11/6/2018	11/8/2018	Barcelona, Spain
SITC's Annual Meeting & Associated Program	11/7/2018	11/11/2018	Washington, DC
AASLD - The Liver Meeting	11/9/2018	11/13/2018	San Francisco, CA
AHA - American Heart Association - Scientific Sessions	11/10/2018	11/14/2018	Chicago, IL
AAPS - Annual Meeting and Expositions	11/12/2018	11/15/2018	San Diego, CA
ObesityWeek	11/12/2018	11/15/2018	Nashville, TN
Biotech and Money Invâ,–\$tival Showcase	11/13/2018	11/13/2018	London, UK
TEDMED Conference	11/14/2018	11/16/2018	Palm Springs, CA
EORTC/NCI/AACR - Symposium on Molecular Targets and Cancer Therapeutics	11/13/2018	11/16/2018	Dublin, Ireland
SNO - Society for Neuro-Oncology - Annual Scientific Meeting	11/15/2018	11/18/2018	New Orleans, LA
ACAAI - American College of Allergy, Asthma & Immunology - Annual Meeting	11/15/2018	11/19/2018	Seattle, WA
AES - American Epilepsy Society - Annual Meeting	11/30/2018	12/4/2018	New Orleans, LA
December			
ASH - American Society of Hematology - Annual Meeting and Exposition	12/1/2018	12/4/2018	San Diego, CA
EUROGIN - International multidiciplinary HPV Conference	12/2/2018	12/5/2018	Lisbon, Portugal
SABCS - San Antonio Breast Cancer Symposium	12/4/2018	12/8/2018	San Antonio, TX
American College of Neuropsychopharmacology	12/9/2018	12/13/2018	Hollywood, FL

Note: Major conferences are shown in bold.

Source: Noble Capital Markets, Biomed Tracker

FDA APPROVALS

Exhibit 10: Selected Pending Approvals Of New Molecule Entities (NMEs) And Biologics

Drug	Expected Date Range	Indication	Company	Ticker
Xyosted	9/28/2018	Hypogonadism	Antares Pharma, Inc.	ATRS
Arikayce	9/28/2018	Respiratory Tract Infections (Excluding Pneumonia)	Insmed, Inc.	INSM
Remune	Before 09/30/2018	HIV / AIDS	Immune Response BioPharma, Inc.	Private
LR769	Before 09/30/2018	Hemophilia A and B - General Clotting Products	LFB Group	Private
Omadacycline	10/2/2018	Skin and Skin-Structure Infections (Antibacterial)	Paratek Pharmaceuticals, Inc.	PRTK
Barhemsys	10/5/2018	Emesis	Acacia Pharma Group plc	ACPH:BB
Inbrija	10/5/2018	Parkinson's Disease (PD)	Acorda Therapeutics, Inc.	ACOR
Jemdel	10/5/2018	Psoriasis	Bausch Health Companies Inc.	BHC
Tegsedi	10/5/2018	Transthyretin (TTR)-related Hereditary Amyloidosis	Ionis Pharmaceuticals, Inc.	IONS
Duvelisib	10/5/2018	CLL/SLL	Verastem, Inc.	VSTM
TX-001HR	10/26/2018	Menopause	TherapeuticsMD, Inc.	TXMD
Dsuvia	11/2/2018	Moderate to Severe Pain	AcelRx Pharmaceuticals, Inc.	ACRX
Biosimilar Pegfilgrastim	11/2/2018	Neutropenia / Leukopenia	Coherus BioSciences, Inc.	CHRS
Olinvo	11/2/2018	Acute Pain	Trevena, Inc.	TRVN
Revefenacin	11/13/2018	Chronic Obstructive Pulmonary Disease (COPD)	Theravance Biopharma, Inc.	TBPH
Aemcolo	11/16/2018	Gastroenteritis	Cosmo Pharmaceuticals N.V.	COPN:SW
Emapalumab	11/20/2018	Inflammatory Disorders	Swedish Orphan Biovitrum	SOBI:SS
Larotrectinib	11/26/2018	Solid Tumors	Loxo Oncology, Inc.	LOXO
Firdapse	11/28/2018	Lambert-Eaton Myasthenic Syndrome (LEMS)	Catalyst Pharmaceuticals Inc.	CPRX
XaraColl	11/30/2018	Postsurgical Pain	Innocoll AG	Private
CAM2038	12/26/2018	Substance Use Disorder	Apple Tree Partners	Private
Dextenza	12/28/2018	Ocular Pain and/or Inflammation (Ophthalmology)	Ocular Therapeutix, Inc.	OCUL
VivaGel	12/28/2018	Urinary Tract and Reproductive Tract Infections (Antibacterial)	Starpharma Holdings Limited	SPL:AU
Tbria	12/31/2018	Osteoporosis / Osteopenia	Tarsa Therapeutics, Inc.	Private
Sacituzumab Govitecan	1/18/2019	Breast Cancer	Immunomedics, Inc.	IMMU
Iclaprim (IV)	2/14/2019	Skin and Skin-Structure Infections (Antibacterial)	Motif Bio plc	MTFB
ALXN1210	2/19/2019	Paroxysmal Nocturnal Hemoglobinuria (PNH)	Alexion Pharmaceuticals, Inc.	ALXN
Loteprednol 0.38%	2/25/2019	Ocular Pain and/or Inflammation (Ophthalmology)	Bausch Health Companies Inc.	BHC
Scenesse	2/25/2019	Porphyria	Clinuvel Pharmaceuticals Ltd.	CLVLY
Elzonris	2/25/2019	Blastic Plasmacytoid Dendritic Cell Neoplasm (BPDCN)	Stemline Therapeutics, Inc.	STML
Roclatan	3/14/2019	Glaucoma / Ocular Hypertension (Ophthalmology)	Aerie Pharmaceuticals, Inc.	AERI
Ryaltris	3/22/2019	Allergic Rhinitis	Glenmark Pharmaceuticals Limited	GNP:IN
Duaklir Pressair	4/1/2019	Chronic Obstructive Pulmonary Disease (COPD)	Circassia Ltd.	CIR:LN
Gimoti	4/1/2019	Diabetic Gastroparesis	Evoke Pharma, Inc.	EVOK
NKTR-181	5/31/2019	Chronic Low Back Pain (CLBP)	Nektar Therapeutics	NKTR

Source: Biomed Tracker, FDA



FDA APPROVALS

Exhibit 11: Upcoming Advisory Committee Meeting Dates

Committee Name	Tentative Dates
Pharmacy Compounding Advisory Committee	September 12, 2018
Tobacco Products Scientific Advisory Committee	September 13-14, 2018
Pediatric Advisory Committee	September 20 and 21, 2018
Advisory Committee for Pharmaceutical Science and Clinical Pharmacology	September 20, 2018
Neurological Devices Panel	September 27, 2018
Vaccines and Related Biological Products	October 3 & November 8, 2018
Science Board to the Food and Drug Administration	October 22, 2018
Allergenic Products Advisory Committee	November 7, 2018
Patient Engagement Advisory Committee	November 2018
Science Advisory Board to NCTR	December 4-5, 2018

Source: Noble Capital Markets, FDA

FDA APPROVALS

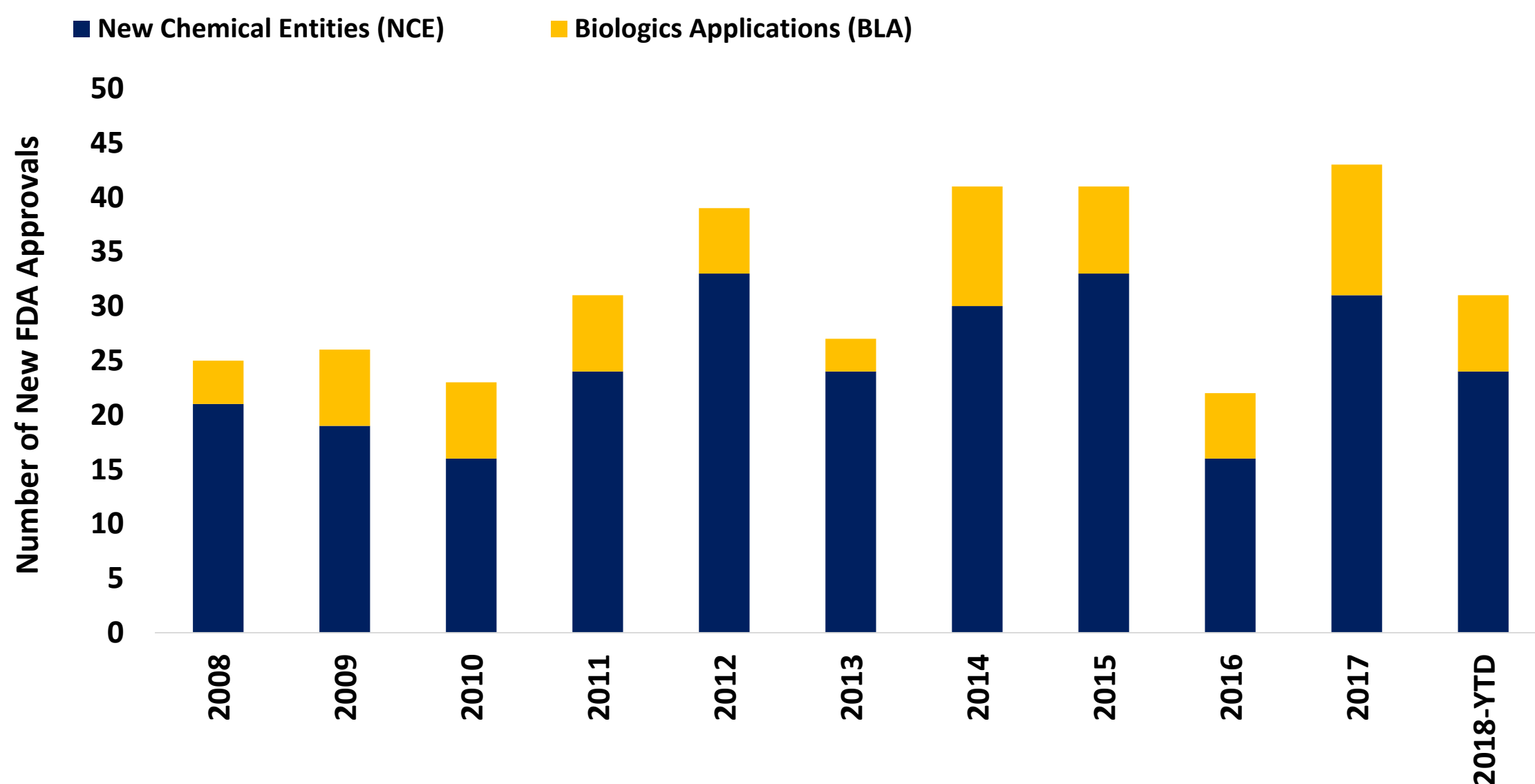
Exhibit 12: Selected Recently Approved Drugs And Biologics, YTD

Drug	Approval Date	Indication	Company	Ticker
Takhzyro	8/23/2018	Types I and II hereditary angioedema	Shire PLC	SHPG
Exervate	8/22/2018	Neurotrophic keratitis	Dompe Biotech	Private
Diacomit	8/20/2018	Seizures associated with Dravet syndrome in patients 2 years of age and older	Laboratoires Biocodex	Private
Galafold	8/10/2018	Fabry disease	Amicus Therapeutics, Inc.	FOLD
Annovera	8/10/2018	Vaginal ring to prevent pregnancy	TherapeuticsMD, Inc.	TXMD
Onpatro	8/10/2018	Polyneuropathy of hereditary transthyretin-mediated amyloidosis	Alnylam Pharmaceuticals, Inc.	ALNY
Poteligeo	8/8/2018	Non-Hodgkin lymphoma	Kyowa Hakko Kirin Co.	4151:TYO
Mulpleta	7/31/2018	Thrombocytopenia in patients with chronic liver disease	Shionogi & Co Ltd	4507:TYO
Omegaven	7/27/2018	Parenteral nutrition-associated cholestasis	Fresenius Kabi	FRE:ETR
Orilissa	7/23/2018	Pain associated with endometriosis	Abbvie Inc.	ABBV
Tibsovo	7/20/2018	Acute myeloid leukemia (AML)	Agios Pharmaceuticals, Inc.	AGIO
Krintafel	7/20/2018	Plasmodium vivax malaria	GlaxoSmithKline plc	GSK
TPOXX	7/13/2018	Smallpox	SIGA Technologies, Inc.	SIGA
Mektovi	6/27/2018	Melanoma	Array BioPharma, Inc.	ARRY
Braftovi	6/27/2018	Melanoma	Array BioPharma, Inc.	ARRY
Epidiolex	6/25/2018	Epilepsy	GW Pharmaceuticals plc	GWPH
Zemdri	6/25/2018	Urinary tract infections	Achaogen Inc.	AKAO
Moxidectin	6/13/2018	Onchocerciasis	Medicines Development for Global Health	Private
Olumiant	5/31/2018	Rheumatoid arthritis	Eli Lilly & Company	LLY
Palynziq	5/24/2018	Phenylketonuria (PKU)	BioMarin Pharmaceutical Inc.	BMRN
Doptelet	5/21/2018	Thrombocytopenia	Dova Pharmaceuticals, Inc.	DOVA
Lokelma	5/18/2018	Hyperkalemia	AstraZeneca PLC	AZN
Aimovig	5/17/2018	Migraine	Amgen, Inc.	AMGN
Lucemyra	5/16/2018	Opioid withdrawal	US WorldMeds, LLC	Private
Akynzeo	4/19/2018	Nausea and vomiting following chemotherapy	Helsinn Healthcare SA	Private
Tavalisse	4/17/2018	Chronic immune thrombocytopenia (ITP)	Rigel Pharmaceuticals, Inc.	RIGL
Crysvita	4/17/2018	X-linked hypophosphatemia (XLH)	Ultragenyx Pharmaceutical Inc.	RARE
Ilumya	3/20/2018	Psoriasis	Sun Pharmaceutical Industries Ltd.	SUNP:IN
Trogarzo	3/6/2018	HIV	Theratechnologies Inc.	THERF
Erleada	2/14/2018	Prostate cancer	Johnson & Johnson	JNJ
Symdeko	2/13/2018	Cystic fibrosis	Vertex Pharmaceuticals Incorporated	VRTX
Biktarvy	2/7/2018	Infection	Gilead Sciences, Inc.	GILD
Lutathera	1/26/2018	Gastroenteropancreatic neuroendocrine tumors	Novartis AG	NVS

Source: Noble Capital Markets, Biomed Tracker, FDA

DRUG LANDSCAPE

Exhibit 13: New FDA Drug Approvals

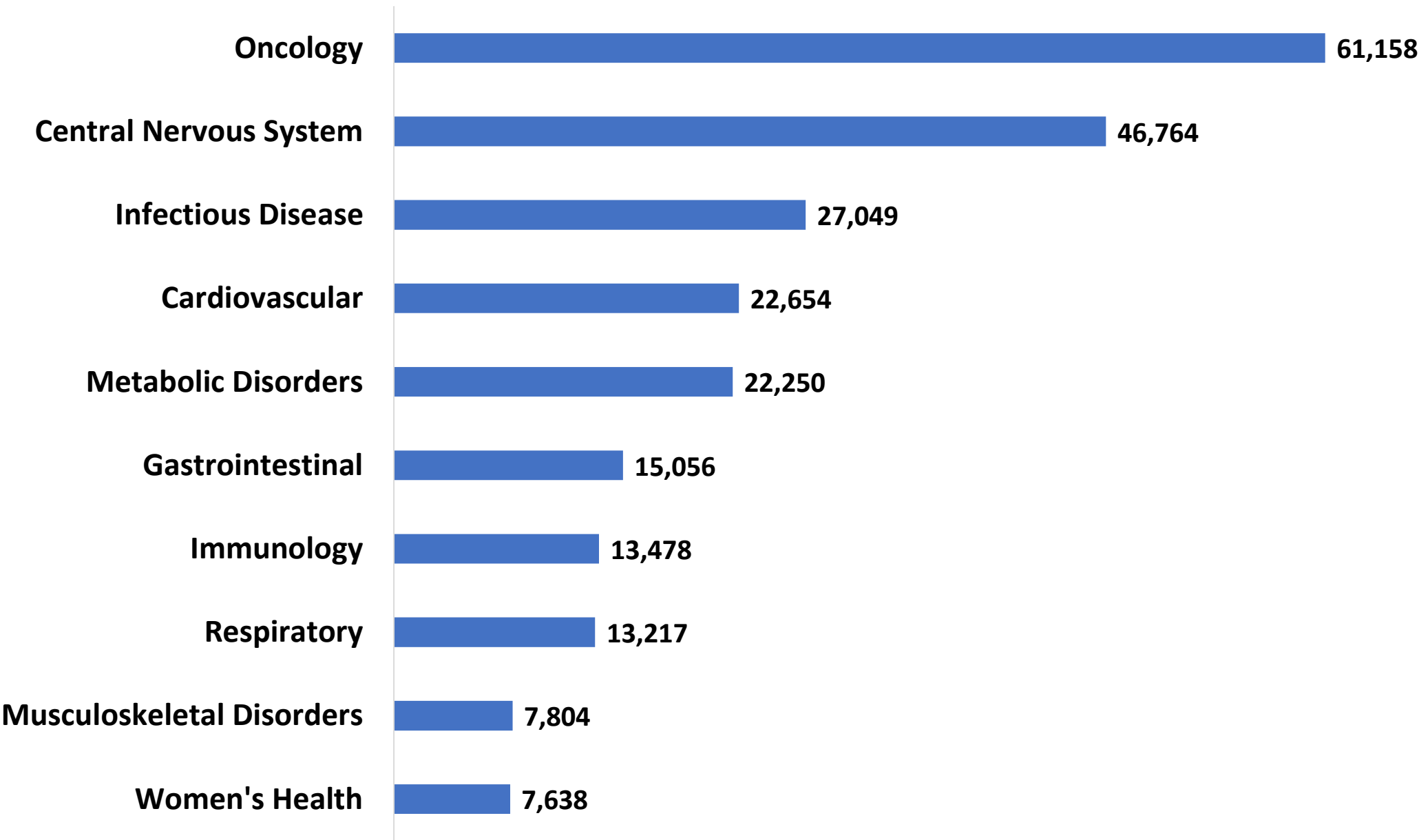


Source: Noble Capital Markets, Bloomberg

46 drug approvals in 2017 (3 non-NCEs) reached to 22 year-high. Thirty-one NCEs have been approved in 2017, compared to a low-productivity year in 2016.

DRUG LANDSCAPE

Exhibit 14: Number Of Drugs In The Pipeline



Source: Noble Capital Markets, Global Data Intelligence

Oncology continues to be the dominant development category, which we think has also been fueled of late by the 1000+ immuno-oncology clinical drug trials.

APPENDIX

Exhibit 15: Cash Analysis, Sorted By Multiple Of Cash (Market Cap < \$500mm)

Company	Ticker	Market Cap in (\$mm)	Cash (\$mm)	Shares Outstanding (mm)	Cash/Share \$	Enterprise Value	EV/Cash
Teligent, Inc.	TLGT	211.5	13.7	53.4	0.3	327.3	23.9x
Veracyte, Inc.	VCYT	483.2	23.8	34.2	0.7	484.7	20.4x
Assertio Therapeutics, Inc.	DEPO	416.4	57.2	63.3	0.9	939.2	16.4x
NantHealth, Inc.	NH	252.7	29.4	110.3	0.3	421.2	14.3x
Vital Therapies, Inc.	VTL	372.9	31.1	42.3	0.7	341.7	11.0x
MannKind Corporation	MNKD	169.1	26.2	120.6	0.2	272.2	10.4x
NanoString Technologies, Inc.	NSTG	480.1	50.7	25.5	2.0	479.2	9.5x
Synergy Pharmaceuticals Inc.	SGYP	486.1	61.2	238.7	0.3	542.8	8.9x
Neos Therapeutics, Inc.	NEOS	163.2	28.0	28.7	1.0	195.1	7.0x
Marinus Pharmaceuticals, Inc.	MRNS	265.8	46.4	33.1	1.4	219.5	4.7x
Savara Inc.	SVRA	394.5	74.9	28.6	2.6	334.9	4.5x
Corium International, Inc.	CORI	353.8	82.5	36.1	2.3	341.7	4.1x
Sienna Biopharmaceuticals, Inc.	SNNA	345.6	74.9	18.9	4.0	300.6	4.0x
Corbus Pharmaceuticals Holdings, Inc.	CRBP	314.6	64.7	54.4	1.2	250.0	3.9x
Inovio Pharmaceuticals, Inc.	INO	457.5	95.6	89.8	1.1	362.0	3.8x
Aratana Therapeutics, Inc.	PETX	250.3	60.0	44.0	1.4	219.8	3.7x
Foamix Pharmaceuticals Ltd.	FOMX	234.1	54.2	38.1	1.4	179.9	3.3x
Strongbridge Biopharma plc	SBBP	266.2	85.5	41.7	2.0	258.3	3.0x
Arbutus Biopharma Corporation	ABUS	493.1	154.9	55.1	2.8	459.2	3.0x
Ra Pharmaceuticals, Inc.	RARX	358.7	95.1	26.2	3.6	263.6	2.8x
Axovant Sciences Ltd.	AXON	295.4	92.9	107.7	0.9	255.5	2.7x
Kala Pharmaceuticals, Inc.	KALA	318.0	91.2	18.6	4.9	246.7	2.7x
Seres Therapeutics, Inc.	MCRB	351.3	96.1	40.6	2.4	255.2	2.7x
Minerva Neurosciences, Inc.	NERV	385.8	108.5	39.3	2.8	278.7	2.6x
Mersana Therapeutics, Inc.	MRSN	320.7	96.5	22.8	4.2	224.2	2.3x
Aurinia Pharmaceuticals Inc.	AUPH	497.4	150.2	84.4	1.8	344.9	2.3x
Aclaris Therapeutics, Inc.	ACRS	485.5	164.6	30.4	5.4	321.4	2.0x
Bellicum Pharmaceuticals, Inc.	BLCM	304.3	129.4	35.1	3.7	210.5	1.6x
Achaogen, Inc.	AKAO	235.1	100.5	43.5	2.3	159.2	1.6x
Tocagen Inc.	TOCA	167.4	79.5	19.9	4.0	113.8	1.4x
NantKwest, Inc.	NK	242.4	104.9	80.4	1.3	144.3	1.4x
Corvus Pharmaceuticals, Inc.	CRVS	311.0	133.2	23.2	5.7	177.7	1.3x
Nabriva Therapeutics plc	NBRV	172.9	75.5	35.6	2.1	98.0	1.3x
Curis, Inc.	CRIS	47.8	40.4	32.1	1.3	45.9	1.1x
Paratek Pharmaceuticals, Inc.	PRTK	318.9	264.0	29.5	9.0	273.4	1.0x
Avadel Pharmaceuticals plc	AVDL	173.2	147.1	38.7	3.8	139.2	0.9x
Concert Pharmaceuticals, Inc.	CNCE	368.6	190.2	23.1	8.2	178.4	0.9x
Cytokinetics, Incorporated	CYTK	412.4	231.9	54.0	4.3	212.9	0.9x
Syndax Pharmaceuticals, Inc.	SNDX	180.8	99.8	23.9	4.2	81.0	0.8x
Aduro BioTech, Inc.	ADRO	498.1	289.1	77.2	3.7	209.0	0.7x

Note: Market cap as of 8/29/2018, Cash value for 2Q18

Source: Noble Capital Markets, Capital IQ

APPENDIX

Exhibit 15: Cash Analysis, Sorted By Multiple Of Cash (Market Cap < \$500mm) (Continued)

Company	Ticker	Market Cap in (\$mm)	Cash (\$mm)	Shares Outstanding (mm)	Cash/Share \$	Enterprise Value	EV/Cash
Tetraphase Pharmaceuticals, Inc.	TTPH	184.7	111.2	50.6	2.2	73.5	0.7x
Dermira, Inc.	DERM	404.7	436.9	41.8	10.5	248.1	0.6x
Achillion Pharmaceuticals, Inc.	ACHN	439.3	286.7	137.9	2.1	152.8	0.5x
Ardelyx, Inc.	ARDX	276.1	212.7	48.9	4.4	112.2	0.5x
Calithera Biosciences, Inc.	CALA	187.1	141.4	35.7	4.0	45.7	0.3x
Akebia Therapeutics, Inc.	AKBA	472.9	402.1	50.0	8.0	70.8	0.2x
PDL BioPharma, Inc.	PDLI	341.7	395.7	150.1	2.6	67.0	0.2x
Chimerix, Inc.	CMRX	201.2	174.8	47.5	3.7	26.7	0.2x
Jounce Therapeutics, Inc.	JNCE	260.0	232.7	32.3	7.2	27.3	0.1x
NewLink Genetics Corporation	NLNK	115.0	137.1	35.3	3.9	-21.9	-0.2x
Celldex Therapeutics, Inc.	CLDX	81.2	114.0	138.6	0.8	-32.8	-0.3x

Note: Market cap as of 8/29/2018, Cash value for 2Q18

Source: Noble Capital Markets, Capital IQ

APPENDIX

Exhibit 16: Cash Analysis, Sorted By Multiple Of Cash (Market Cap > \$500mm)

Company	Ticker	Market Cap in (\$mm)	Cash (\$mm)	Shares Outstanding (mm)	Cash/Share \$	Enterprise Value	EV/Cash
Shire plc	SHPG	53,561.9	259.7	909.4	0.3	70,956.3	273.2x
Medpace Holdings, Inc.	MEDP	2,202.1	22.2	36.6	0.6	2,371.0	106.7x
Mylan N.V.	MYL	20,246.3	390.2	524.4	0.7	34,543.3	88.5x
PetIQ, Inc.	PETQ	622.8	11.7	14.3	0.8	789.3	67.6x
PRA Health Sciences, Inc.	PRAH	6,799.5	123.2	63.3	1.9	7,983.3	64.8x
Syneos Health, Inc.	SYNH	5,125.0	172.8	99.7	1.7	7,855.3	45.5x
OPKO Health, Inc.	OPK	3,297.1	80.4	559.5	0.1	3,426.4	42.6x
Bio-Techne Corporation	TECH	7,233.9	181.8	37.5	4.8	7,391.1	40.7x
Grifols, S.A.	GRFS	18,573.7	780.5	684.7	1.1	24,987.1	32.0x
Seattle Genetics, Inc.	SGEN	12,122.1	448.0	149.6	3.0	11,674.2	26.1x
Regeneron Pharmaceuticals, Inc.	REGN	43,892.6	1,683.5	107.3	15.7	42,915.0	25.5x
Alexion Pharmaceuticals, Inc.	ALXN	27,369.3	1,186.1	222.8	5.3	29,388.0	24.8x
Celgene Corporation	CELG	66,214.6	3,417.0	755.4	4.5	84,084.6	24.6x
Biogen Inc.	BIIB	70,503.0	3,224.2	210.4	15.3	73,200.0	22.7x
Neurocrine Biosciences, Inc.	NBIX	11,006.5	508.7	89.2	5.7	10,876.6	21.4x
Arrowhead Pharmaceuticals, Inc.	ARWR	1,292.2	60.5	80.3	0.8	1,233.5	20.4x
Illumina, Inc.	ILMN	51,542.6	2,512.0	146.5	17.1	50,689.6	20.2x
The Medicines Company	MDCO	3,012.7	183.6	73.4	2.5	3,491.9	19.0x
Myriad Genetics, Inc.	MYGN	3,526.9	180.6	69.4	2.6	3,355.6	18.6x
Reata Pharmaceuticals, Inc.	RETA	2,532.6	138.7	25.8	5.4	2,472.5	17.8x
NovoCure Limited	NVCR	3,922.1	219.0	90.0	2.4	3,852.4	17.6x
Innoviva, Inc.	INVA	1,475.9	107.5	103.6	1.0	1,856.9	17.3x
Ironwood Pharmaceuticals, Inc.	IRWD	2,885.5	181.2	150.6	1.2	3,111.4	17.2x
Amphastar Pharmaceuticals, Inc.	AMPH	845.1	50.9	46.4	1.1	846.8	16.6x
Vertex Pharmaceuticals Incorporated	VRTX	47,242.8	2,767.8	252.3	11.0	45,096.4	16.3x
Alkermes plc	ALKS	7,083.4	433.5	154.3	2.8	6,930.3	16.0x
ANI Pharmaceuticals, Inc.	ANIP	682.6	55.0	11.6	4.7	832.2	15.1x
Supernus Pharmaceuticals, Inc.	SUPN	2,373.1	174.4	51.4	3.4	2,520.6	14.5x
Omeros Corporation	OMER	1,164.9	88.4	47.7	1.9	1,206.9	13.7x
Jazz Pharmaceuticals plc	JAZZ	10,357.8	816.6	60.0	13.6	11,132.9	13.6x
Genomic Health, Inc.	GHDX	2,161.7	152.9	35.1	4.4	2,008.8	13.1x
Repligen Corporation	RGEN	2,380.4	175.6	43.1	4.1	2,306.1	13.1x
BioMarin Pharmaceutical Inc.	BMRN	17,751.9	1,363.1	175.9	7.8	17,580.5	12.9x
Athenex, Inc.	ATNX	1,090.7	80.7	60.1	1.3	1,012.1	12.5x
Incyte Corporation	INCY	15,747.7	1,198.4	210.5	5.7	14,573.9	12.2x
Eagle Pharmaceuticals, Inc.	EGRX	1,229.0	100.2	14.9	6.7	1,175.5	11.7x
Puma Biotechnology, Inc.	PBYI	1,585.6	134.5	37.6	3.6	1,571.4	11.7x
Exelixis, Inc.	EXEL	5,823.6	499.9	296.0	1.7	5,345.0	10.7x
Endo International plc	ENDP	3,735.2	1,098.8	223.5	4.9	10,903.6	9.9x
Amarin Corporation plc	AMRN	946.5	102.3	280.2	0.4	985.6	9.6x
BioCryst Pharmaceuticals, Inc.	BCRX	795.2	80.7	94.9	0.9	766.2	9.5x
Aerie Pharmaceuticals, Inc.	AERI	2,873.9	286.1	37.6	7.6	2,711.8	9.5x
G1 Therapeutics, Inc.	GTHX	1,936.6	188.2	29.8	6.3	1,748.4	9.3x
Sarepta Therapeutics, Inc.	SRPT	9,268.1	949.1	63.9	14.9	8,758.3	9.2x
TherapeuticsMD, Inc.	TXMD	1,483.1	154.4	213.5	0.7	1,401.9	9.1x
Spectrum Pharmaceuticals, Inc.	SPPI	2,548.3	269.7	96.8	2.8	2,318.0	8.6x
GW Pharmaceuticals plc	GWPH	4,168.1	440.7	26.9	16.4	3,744.4	8.5x

Note: Market cap as of 8/29/2018,

Cash value for 2Q18

Source: Noble Capital Markets, Capital IQ

APPENDIX

Exhibit 16: Cash Analysis, Sorted By Multiple Of Cash (Market Cap > \$500mm) (Continued)

Company	Ticker	Market Cap in (\$mm)	Cash (\$mm)	Shares Outstanding (mm)	Cash/Share \$	Enterprise Value	EV/Cash
China Biologic Products Holdings, Inc.	CBPO	3,331.5	366.2	30.4	12.1	3,095.2	8.5x
Pacific Biosciences of California, Inc.	PACB	580.5	63.5	122.0	0.5	531.2	8.4x
Cerus Corporation	CERS	1,013.0	111.9	120.1	0.9	930.9	8.3x
Coherus BioSciences, Inc.	CHRS	1,366.6	159.8	59.2	2.7	1,307.8	8.2x
Xencor, Inc.	XNCR	2,324.6	255.4	49.3	5.2	2,069.2	8.1x
Luminex Corporation	LMNX	1,254.4	139.0	43.5	3.2	1,115.4	8.0x
bluebird bio, Inc.	BLUE	9,255.6	1,077.0	48.1	22.4	8,333.9	7.7x
Accelaron Pharma Inc.	XLRN	2,450.6	287.9	44.0	6.5	2,162.6	7.5x
Alnylam Pharmaceuticals, Inc.	ALNY	11,989.3	1,447.7	97.1	14.9	10,571.7	7.3x
REGENXBIO Inc.	RGNX	2,365.6	286.5	31.5	9.1	2,079.1	7.3x
Array BioPharma Inc.	ARRY	3,269.1	412.5	198.5	2.1	2,968.3	7.2x
Progenics Pharmaceuticals, Inc.	PGNX	664.9	87.5	71.8	1.2	625.1	7.1x
DBV Technologies S.A.	DBVT	1,322.2	165.6	24.8	6.7	1,165.8	7.0x
AnaptysBio, Inc.	ANAB	2,109.2	267.9	22.8	11.7	1,852.9	6.9x
BeiGene, Ltd.	BGNE	10,560.0	1,369.6	48.2	28.4	9,413.6	6.9x
FibroGen, Inc.	FGEN	5,135.9	671.9	81.2	8.3	4,597.7	6.8x
Endocyte, Inc.	ECYT	1,305.8	166.8	53.9	3.1	1,139.0	6.8x
CRISPR Therapeutics AG	CRSP	2,482.6	319.7	43.3	7.4	2,162.9	6.8x
Ultragenyx Pharmaceutical Inc.	RARE	4,210.3	547.1	45.9	11.9	3,663.2	6.7x
Ascendis Pharma A/S	ASND	3,183.7	411.4	37.5	11.0	2,772.3	6.7x
Immunomedics, Inc.	IMMU	4,812.8	638.8	153.5	4.2	4,192.9	6.6x
Adaptimmune Therapeutics plc	ADAP	972.5	129.0	93.8	1.4	843.5	6.5x
PTC Therapeutics, Inc.	PTCT	2,080.0	296.1	43.8	6.8	1,932.7	6.5x
Loxo Oncology, Inc.	LOXO	5,018.4	671.0	30.0	22.4	4,347.4	6.5x
Horizon Pharma Public Limited Company	HZNP	3,377.6	710.2	164.3	4.3	4,552.5	6.4x
Esperion Therapeutics, Inc.	ESPR	1,332.9	180.2	26.0	6.9	1,152.9	6.4x
Zogenix, Inc.	ZGNX	1,963.8	272.1	32.4	8.4	1,691.7	6.2x
Lexicon Pharmaceuticals, Inc.	LXRX	1,227.1	209.7	105.7	2.0	1,262.5	6.0x
Halozyme Therapeutics, Inc.	HALO	2,630.7	398.9	142.3	2.8	2,397.9	6.0x
Sage Therapeutics, Inc.	SAGE	7,615.1	1,092.4	42.2	25.9	6,522.7	6.0x
Intercept Pharmaceuticals, Inc.	ICPT	3,234.7	538.3	26.2	20.5	3,059.6	5.7x
Momenta Pharmaceuticals, Inc.	MNTA	2,069.1	310.8	75.4	4.1	1,758.3	5.7x
Enanta Pharmaceuticals, Inc.	ENTA	1,766.6	273.2	19.2	14.2	1,495.3	5.5x
Nektar Therapeutics	NKTR	11,512.3	1,823.8	161.8	11.3	9,934.6	5.4x
Agios Pharmaceuticals, Inc.	AGIO	4,605.2	716.9	52.7	13.6	3,888.3	5.4x
Geron Corporation	GERN	1,000.7	160.9	163.4	1.0	839.8	5.2x
Ligand Pharmaceuticals Incorporated	LGND	5,416.5	1,016.7	21.1	48.1	5,206.1	5.1x
uniQure N.V.	QURE	1,564.4	259.2	31.2	8.3	1,326.1	5.1x
MyoKardia, Inc.	MYOK	2,386.9	398.6	35.6	11.2	1,988.3	5.0x
Cara Therapeutics, Inc.	CARA	783.5	132.0	32.8	4.0	651.5	4.9x
Pacira Pharmaceuticals, Inc.	PCRX	1,894.4	371.3	40.6	9.1	1,806.7	4.9x
Iovance Biotherapeutics, Inc.	IOVA	1,572.5	276.1	77.7	3.6	1,296.4	4.7x
Aimmune Therapeutics, Inc.	AIMT	1,645.0	290.0	53.2	5.5	1,355.0	4.7x
Akcea Therapeutics, Inc.	AKCA	2,162.7	381.9	67.4	5.7	1,780.8	4.7x
INSYS Therapeutics, Inc.	INSY	591.0	104.9	73.1	1.4	486.1	4.6x
Amgen Inc.	AMGN	129,292.6	29,395.0	704.0	41.8	134,394.6	4.6x

Note: Market cap as of 8/29/2018,

Cash value for 2Q18

Source: Noble Capital Markets, Capital IQ

APPENDIX

Exhibit 16: Cash Analysis, Sorted By Multiple Of Cash (Market Cap > \$500mm) (Continued)

Company	Ticker	Market Cap in (\$mm)	Cash (\$mm)	Shares Outstanding (mm)	Cash/Share \$	Enterprise Value	EV/Cash
Dova Pharmaceuticals, Inc.	DOVA	718.0	134.7	26.5	5.1	603.5	4.5x
Global Blood Therapeutics, Inc.	GBT	2,527.2	462.5	46.7	9.9	2,064.7	4.5x
Calyxt, Inc.	CLXT	552.8	105.6	27.8	3.8	466.0	4.4x
Novavax, Inc.	NVAX	570.1	167.1	331.5	0.5	721.4	4.3x
Blueprint Medicines Corporation	BPMC	3,253.4	613.5	41.7	14.7	2,640.6	4.3x
Kura Oncology, Inc.	KURA	643.4	125.9	29.6	4.2	524.5	4.2x
Theravance Biopharma, Inc.	TBPH	1,569.4	352.9	53.1	6.6	1,440.7	4.1x
Karyopharm Therapeutics Inc.	KPTI	1,214.3	241.1	50.4	4.8	973.2	4.0x
Amicus Therapeutics, Inc.	FOLD	2,534.4	539.0	173.1	3.1	2,164.9	4.0x
Alder Biopharmaceuticals, Inc.	ALDR	1,224.8	308.6	67.1	4.6	1,193.4	3.9x
Portola Pharmaceuticals, Inc.	PTLA	1,912.5	435.9	63.9	6.8	1,685.2	3.9x
Retrophin, Inc.	RTRX	1,188.5	255.7	39.3	6.5	978.3	3.8x
Radius Health, Inc.	RDUS	935.5	231.2	44.7	5.2	877.0	3.8x
United Therapeutics Corporation	UTHR	5,474.1	1,213.0	43.4	28.0	4,511.1	3.7x
Gilead Sciences, Inc.	GILD	98,029.3	27,103.0	1,304.5	20.8	100,048.3	3.7x
Vanda Pharmaceuticals Inc.	VNDA	1,065.9	231.2	47.1	4.9	834.7	3.6x
AMAG Pharmaceuticals, Inc.	AMAG	846.3	351.2	34.7	10.1	1,237.7	3.5x
Editas Medicine, Inc.	EDIT	1,502.5	344.1	44.2	7.8	1,191.4	3.5x
Atara Biotherapeutics, Inc.	ATRA	1,813.7	417.0	36.3	11.5	1,407.0	3.4x
Collegium Pharmaceutical, Inc.	COLL	568.1	133.7	32.0	4.2	445.8	3.3x
Acorda Therapeutics, Inc.	ACOR	1,358.0	391.7	46.3	8.5	1,305.3	3.3x
Galapagos NV	GLPG	5,359.5	1,244.6	51.0	24.4	4,111.9	3.3x
ImmunoGen, Inc.	IMGN	1,479.0	345.1	120.7	2.9	1,136.0	3.3x
Intellia Therapeutics, Inc.	NTLA	1,302.5	305.5	39.8	7.7	997.0	3.3x
Revance Therapeutics, Inc.	RVNC	995.5	233.7	33.5	7.0	761.7	3.3x
Audentes Therapeutics, Inc.	BOLD	1,334.1	314.4	32.5	9.7	1,019.7	3.2x
Tesaro, Inc.	TSRO	1,783.5	575.1	54.5	10.5	1,848.3	3.2x
Rigel Pharmaceuticals, Inc.	RIGL	540.9	135.0	144.5	0.9	405.9	3.0x
Epizyme, Inc.	EPZM	813.2	215.6	67.0	3.2	597.6	2.8x
Spark Therapeutics, Inc.	ONCE	2,337.3	647.2	36.4	17.8	1,725.5	2.7x
Clovis Oncology, Inc.	CLVS	1,924.3	682.2	50.5	13.5	1,816.4	2.7x
ChemoCentryx, Inc.	CCXI	642.8	182.0	48.9	3.7	475.5	2.6x
Ionis Pharmaceuticals, Inc.	IONS	6,340.7	1,980.5	125.8	15.7	5,107.3	2.6x
Adamas Pharmaceuticals, Inc.	ADMS	611.8	203.0	24.6	8.2	520.1	2.6x
Voyager Therapeutics, Inc.	VYGR	687.6	196.1	29.8	6.6	491.5	2.5x
Arena Pharmaceuticals, Inc.	ARNA	1,875.2	592.4	41.6	14.2	1,342.6	2.3x
Sangamo Therapeutics, Inc.	SGMO	1,708.1	539.4	88.1	6.1	1,168.7	2.2x
CytomX Therapeutics, Inc.	CTMX	1,048.1	335.1	38.2	8.8	713.0	2.1x
Insmmed Incorporated	INSM	1,663.3	634.3	73.9	8.6	1,336.1	2.1x
MacroGenics, Inc.	MGNX	921.2	300.9	38.2	7.9	620.3	2.1x
Flexion Therapeutics, Inc.	FLXN	836.5	340.5	36.0	9.5	655.2	1.9x
Intra-Cellular Therapies, Inc.	ITCI	1,180.6	403.8	51.8	7.8	776.9	1.9x
GlycoMimetics, Inc.	GLYC	647.6	229.4	36.2	6.3	418.1	1.8x
Collectis S.A.	CLLS	1,254.8	491.1	37.5	13.1	804.7	1.6x
Five Prime Therapeutics, Inc.	FPRX	500.2	352.8	30.7	11.5	147.5	0.4x
Prothena Corporation plc	PRTA	613.9	486.2	38.8	12.5	179.8	0.4x

Note: Market cap as of 8/29/2018,

Cash value for 2Q18

Source: Noble Capital Markets, Capital IQ

APPENDIX

Exhibit 17: Catalyst Calendar For Small Cap Biotechnology Companies

Company	Ticker	Drug	Indication	Catalyst	Date
Fortress Biotech, Inc.	FBIO	CK-101	Non-Small Cell Lung Cancer (NSCLC)	Phase I/II - Top-Line Results at IASLC	9/24/2018
Antares Pharma, Inc.	ATRS	Xyosted	Hypogonadism	PDUFA for NDA - Second Review	9/28/2018
Actinium Pharmaceuticals, Inc.	ATNM	Actimab-MDS	Myelodysplastic Syndrome (MDS)	Meeting with FDA	3Q18
Akari Therapeutics, Plc	AKTX	Coversin	Hemolytic Uremic Syndrome (HUS)	Phase II - Top-Line Results	3Q18
BioDelivery Sciences International, Inc.	BDSI	Buprenorphine Depot	Substance Use Disorder	Phase I Multi-Dose PK - Top-line Results	3Q18
Capricor Therapeutics, Inc.	CAPR	CAP-1002	Duchenne Muscular Dystrophy (DMD)	Meeting w/FDA	3Q18
Chimerix, Inc.	CMRX	CMX521	Norovirus	Phase I - Top-Line Results	3Q18
Correvo Pharma Corp.	CORV	Brinavess	Atrial Fibrillation/Flutter	Phase IV SPECTRUM - Top-Line Results	3Q18
Eiger BioPharmaceuticals, Inc.	EIGR	Bestatin	Edema	Phase II ULTRA - Top-line Results	3Q18
IMV Inc.	IMV	DPX-Survivac	Diffuse Large B-Cell Lymphoma (DLBCL)	Phase II Triple Combination - Top-Line Results	3Q18
IMV Inc.	IMV	DPX-Survivac	Ovarian Cancer	Phase II PESCO - Top-line Results	3Q18
Innovation Pharmaceuticals Inc.	IPIX	Brilacidin	Mucositis	Meeting with FDA	3Q18
Marinus Pharmaceuticals, Inc.	MRNS	Ganaxolone	Major Depressive Disorder (MDD)	Phase II Magnolia - Top-Line Results	3Q18
MediciNova, Inc.	MNOV	MN-166	Amyotrophic Lateral Sclerosis (ALS)	Meeting With FDA	3Q18
Novan Therapeutics	NOVN	SB204	Acne	Type C Meeting with FDA	3Q18
Palatin Technologies, Inc.	PTN	PL-8177	Ulcerative Colitis (UC)	Phase I - Top-Line Results	3Q18
Pfenex Inc.	PFNX	Biosimilar Teriparatide (Pfenex)	Osteoporosis / Osteopenia	505(b)(2) NDA Filing	3Q18
Regulus Therapeutics Inc.	RGLS	RG-012	Alport Syndrome	Phase II - HERA - Top-Line Results	3Q18
Vital Therapies, Inc.	VTL	ELAD	Liver Failure / Cirrhosis	Phase III VTL-308 - Top-Line Results	9/1/2018
Verastem, Inc.	VSTM	Duvelisib	Chronic Lymphocytic Leukemia (CLL)/Small Cell Lymphocytic Lymphoma (SLL)	PDUFA for NDA - First Review	10/5/2018
ArQule, Inc.	ARQL	Miransertib	Proteus Syndrome	Phase I/II - Top-Line Results at ASHG	10/16/2018-10/20/2018
ADMA Biologics, Inc.	ADMA	Bivigam	Primary Immunodeficiencies	PDUFA for sBLA - First Review	10/25/2018

Note: Market cap: \$50-\$300M

Source: Noble Capital Markets, Biomed Tracker, Company filings

APPENDIX

Exhibit 17: Catalyst Calendar For Small Cap Biotechnology Companies (Continued)

Company	Ticker	Drug	Indication	Catalyst	Date
Affimed N.V.	AFMD	AFM11	Non-Hodgkin's Lymphoma (NHL), Acute Lymphocytic Leukemia (ALL)	Phase I - Top-Line Results	2H18
BioDelivery Sciences International, Inc.	BDSI	Buprenorphine Depot	Substance Use Disorder	Phase I Single Dose PK - Top-line Results	2H18
Leap Therapeutics, Inc.	LPTX	TRX518	Solid Tumors	Phase I 003 - Top-Line Results	2H18
Oxford BioMedica plc	OXB:LN	TroVax	Mesothelioma	Phase II SKOPOS - Top-Line Results	2H18
Oxford BioMedica plc	OXB:LN	TroVax	Ovarian Cancer	Phase II TRIOC - Top-Line Results	2H18
Scynexis, Inc.	SCYX	Ibrexafungerp	Fungal Infections - Non-Systemic	End-of-Phase II Meeting	2H18
Trevena, Inc.	TRVN	Oliceridine	Acute Pain	PDUFA for NDA - First Review	11/2/2018
Alimera Sciences, Inc.	ALIM	Iluvien	Uveitis (Ophthalmology)	PDUFA for sNDA - First Review	11/5/2018
Arrowhead Pharmaceuticals, Inc.	ARWR	ARO-HBV	Hepatitis B (HBV) Treatment (Antiviral)	Phase I/II - Top-Line Results	11/09/2018-11/13/2018
GTx, Inc.	GTXI	Enobosarm	Urinary Incontinence	Phase II ASTRID - Top-Line Results	10/01/2018-11/15/2018
Catalyst Pharmaceuticals Inc.	CPRX	Firdapse	Lambert-Eaton Myasthenic Syndrome (LEMS)	PDUFA for NDA - Second Review	11/28/2018
Ocular Therapeutix, Inc.	OCUL	Dextenza	Ocular Pain and/or Inflammation (Ophthalmology)	PDUFA for NDA - Third Review	12/2018/2018
Actinium Pharmaceuticals, Inc.	ATNM	Actimab-M	Multiple Myeloma (MM)	Phase I - Top-Line Results	10/01/2018-12/31/2018
Adverum Biotechnologies, Inc.	ADVM	ADVM-043	Emphysema	Phase I/II ADVANCE - Top-Line Results	2H18
Aeglea BioTherapeutics, Inc.	AGLE	Pegzilarginase	Small Cell Lung Cancer (SCLC)	Phase I - Top-Line Results	4Q18
Aeglea BioTherapeutics, Inc.	AGLE	Pegzilarginase	Solid Tumors	Phase I/II w/Pembrolizumab - Top-Line Results	4Q18
Aevi Genomic Medicine, Inc.	GNMX	AEVI-001	Attention Deficit Hyperactivity Disorder (ADHD)	Phase II - Top-Line Results	4Q18
Akari Therapeutics, Plc	AKTX	Coversin	Bullous Pemphigoid	Phase II - Top-Line Results	4Q18
Allergy Therapeutics plc	AGY:LN	Pollinex Quattro Grass	Allergic Rhinitis	End Of Phase II Meeting With FDA	2H18
Ardelyx Inc.	ARDX	Tenapanor	Irritable Bowel Syndrome (IBS)	NDA Filing	2H18
Axsome Therapeutics, Inc.	AXSM	AXS-05	Alzheimer's Disease (AD), Major Depressive Disorder (MDD)	Phase II/III ADVANCE-1 (w/Agitation) - Top-Line Results	2H18
BioLineRx Ltd.	BLRX	BL-8040	Acute Myelogenous Leukemia (AML)	Phase Ib BATTLE - Top-Line Results	2H18

Note: Market cap: \$50-\$300M

Source: Noble Capital Markets, Biomed Tracker, Company filings

APPENDIX

Exhibit 17: Catalyst Calendar For Small Cap Biotechnology Companies (Continued)

Company	Ticker	Drug	Indication	Catalyst	Date
Cantargia AB	CANTA	CAN04 :SS	Non-Small Cell Lung Cancer (NSCLC)	Phase I/II CANFOUR - Top-Line Results (Dose-Escalation)	4Q18
CASI Pharmaceuticals, Inc.	CASI	ENMD-2076	Hepatocellular (Liver) Cancer (HCC) (Including Secondary Metastases)	Phase II - Top-Line Results	2H18
Cellular Biomedicine Group, CBMG Inc.	CBMG	C-CAR011	Diffuse Large B-Cell Lymphoma (DLBCL) - NHL	Phase I - Top-Line Results	2H18
Chimerix, Inc.	CMRX	Brincidofovir (IV)	Cytomegalovirus (CMV) Infection (Antiviral)	Virally-Infected Patient Study Data, Meeting with FDA	2H18
Clearside Biomedical, Inc.	CLSD	CLS-1001	Uveitis, Macular Edema from Retinal Vein Occlusion (RVO)	505(b)(2) NDA Filing, Phase III SAPPHIRE - Top-Line Results	4Q18
Cocrystal Pharma, Inc.	COCP	CC-31244	Hepatitis C (HCV) (Antiviral)	Phase IIa - Top-Line Results	4Q18
Codexis, Inc.	CDXS	CDX-6114	Phenylketonuria (PKU)	Phase Ia - Top-Line Results	4Q18
ContraFect Corporation	CFRX	CF-301	Staphylococcal Vaccines and Other Staphylococcus-Specific Agents	Phase II - Top-Line Results	4Q18
Dicerna Pharmaceuticals, Inc.	DRNA	DCR-PHXC	Hyperoxaluria	Phase I DCR-PHXC-101 - Top-Line Results	2H18
DURECT Corporation	DRRX	DUR-928	Primary Sclerosing Cholangitis (PSC), Liver Failure / Cirrhosis	Phase IIa - Top Line Results, Phase IIa AH - Top-Line Results	2H18
Eiger BioPharmaceuticals, Inc.	EIGR	Avexitide, Sarasar	Hyperinsulinemia/Hypoglycemia, Hutchinson–Gilford Progeria Syndrome	Phase II PREVENT - Top-Line Results, Meeting with FDA	4Q18
Fennec Pharmaceuticals Inc.	FENC	Sodium Thiosulfate	Hearing Loss - Chemotherapy-Induced	FDA Pre-NDA Meeting, NDA Filing	2H18
Fortress Biotech, Inc.	FBIO	CUTX-101	Metabolic - General	Meeting with FDA	2H18
HedgePath Pharmaceuticals, Inc.	HPPI	SUBA-Itraconazole	Skin Cancer - Basal Cell Carcinoma (BCC)	sNDA Filing	2H18
Immutep Ltd.	IMMP	Eftilagimod Alpha	Solid Tumors	Phase I INSIGHT - Top-Line Results	4Q18
Innovation Pharmaceuticals Inc.	IPIX	Prurisol	Psoriasis	End Of Phase II Meeting With FDA	2H18
KemPharm, Inc.	KMPH	KP201	Acute Pain	NDA Filing	2H18
Krystal Biotech, Inc.	KRYS	KB103	Epidermolysis Bullosa	Phase I/II - Top-Line Results	2H18
Kura Oncology, Inc.	KURA	KO-947	Solid Tumors	Phase I Non-Hematological Malignancies - Top-Line Results	2H18
Kura Oncology, Inc.	KURA	Tipifarnib (Oncology)	Myelodysplastic Syndrome (MDS)	Phase II - Top-Line Results	2H18
Lipocine Inc.	LPCN	Tlando	Hypogonadism	Phase I - Top-Line Results	2H18
Marinus Pharmaceuticals, Inc.	MRNS	Ganaxolone	Seizure Disorders (Epilepsy)	Phase II Status Epilepticus - Top-Line Results	4Q18

Note: Market cap: \$50-\$300M

Source: Noble Capital Markets, Biomed Tracker, Company filings

APPENDIX

Exhibit 17: Catalyst Calendar For Small Cap Biotechnology Companies (Continued)

Company	Ticker	Drug	Indication	Catalyst	Date
Marinus Pharmaceuticals, Inc.	MRNS	Ganaxolone	Major Depressive Disorder (MDD)	Phase II Amaryllic - Top-Line Results	4Q18
Matinas BioPharma	MTNB	MAT2501	Respiratory Tract Infections (Excluding Pneumonia) (Antibacterial)	Phase I - MAD (Healthy Subjects) Top-line Results	4Q18
Merrimack Pharmaceuticals, Inc.	MACK	Seribantumab	Breast Cancer	Phase II SHERBOC - Top-Line Results	2H18
Merrimack Pharmaceuticals, Inc.	MACK	Seribantumab	Non-Small Cell Lung Cancer (NSCLC)	Phase II Heregulin Positive - Top-Line Results	2H18
Merrimack Pharmaceuticals, Inc.	MACK	MM-310	Solid Tumors	Phase I - Top-Line Results	2H18
Molecular Templates Inc.	MTEM	MT-3724	Diffuse Large B-Cell Lymphoma (DLBCL) - NHL	Combination Study - Top-Line Results	2H18
Novan Therapeutics	NOVN	SB204	Acne	NDA Submission	2H18
Novan Therapeutics	NOVN	SB414	Psoriasis	Phase Ib Safety - Top-Line Results	2H18
Novan Therapeutics	NOVN	SB206	Antiviral - Other Treatments	Phase II - Top-Line Results	4Q18
OncoMed Pharmaceuticals, Inc.	OMED	Navicixizumab	Solid Tumors	Phase Ia - Top-Line Results	2H18
OncoMed Pharmaceuticals, Inc.	OMED	OMP-313M32	Solid Tumors	Phase Ia - Top-Line Results	4Q18
OncoMed Pharmaceuticals, Inc.	OMED	Navicixizumab	Ovarian Cancer	Phase Ib - Top-Line Results	2H18
OncoMed Pharmaceuticals, Inc.	OMED	Navicixizumab	Colorectal Cancer (CRC)	Phase Ib - Top-Line Results	2H18
Ophthotech Corporation	OPHT	Fovista	Solid Tumors	Phase I/II Von Hippel-Lindau Syndrome - Top-Line Results	2H18
Ophthotech Corporation	OPHT	Zimura	Wet Age-Related Macular Degeneration (Wet AMD) (Ophthalmology)	Phase IIa - Top-Line Results	4Q18
Opiant Pharmaceuticals, Inc.	OPNT	OPNT001	Eating Disorders	Phase II - Top-Line Results	2H18
Ovid Therapeutics, Inc.	OVID	TAK-935	Lennox-Gastaut Syndrome (LGS; Epilepsy)	Phase Ib/IIa - 2001 - Top-Line Results	4Q18
Palatin Technologies, Inc.	PTN	PL-3994	Congestive Heart Failure (CHF) and Cardiomyopathies	Phase IIa - Top-Line Results	2H18
Pieris Pharmaceuticals, Inc.	PIRS	PRS-343	Solid Tumors	Phase I - Top-Line Results	2H18
Pieris Pharmaceuticals, Inc.	PIRS	PRS-080	Anemia	Phase IIa - Top-Line Results	2H18
ProQR Therapeutics N.V.	PRQR	QR-110	Leber's Congenital Amaurosis (Ophthalmology)	Phase I/II - Top-Line Results	2H18
ProQR Therapeutics N.V.	PRQR	QR-313	Epidermolysis Bullosa	Phase I/II - Top-Line Results	2H18

Note: Market cap: \$50-\$300M

Source: Noble Capital Markets, Biomed Tracker, Company filings

APPENDIX

Exhibit 17: Catalyst Calendar For Small Cap Biotechnology Companies (Continued)

Company	Ticker	Drug	Indication	Catalyst	Date
Protagonist Therapeutics, Inc.	PTGX	PTG-100	Ulcerative Colitis (UC)	Meeting with FDA	2H18
Resverlogix Corporation	RVXCF	Apabetalone	Diabetes Mellitus, Type II	Phase III BETonMace - Primary Endpoint Results	4Q18
Resverlogix Corporation	RVXCF	Apabetalone	Dyslipidemia / Hypercholesterolemia	Phase III BETonMace - Primary Endpoint Results	4Q18
Rexahn Pharmaceuticals, Inc.	RNN	RX-3117	Pancreatic Cancer	Phase IIa w/Abraxane - Top-Line Results	4Q18
Rezolute, Inc.	RZLT	AB101	Diabetes Mellitus, Type I	Phase I SAD - Top-Line Results	2H18
Savara Inc.	SVRA	Molgradex	Respiratory Tract Infections (Excluding Pneumonia) (Antibacterial)	Phase IIa OPTIMA - Top-Line Results	4Q18
Sierra Oncology, Inc.	SRRA	SRA737	Solid Tumors	Phase I/II - CRUKD/16/002 - Top-Line Results	4Q18
Spring Bank Pharmaceuticals, Inc.	SBPH	Inarigivir	Hepatitis B (HBV) Treatment (Antiviral)	Phase II w/Vemlidy - Top-Line Results	2H18
Strongbridge Biopharma plc	SBBP	Recorlev	Cushing's Syndrome	Meeting with FDA	4Q18
Sunesis Pharmaceuticals, Inc.	SNSS	SNS-062	Hematologic Cancer	Phase Ib/II - Top-Line Results	2H18
Syndax Pharmaceuticals, Inc.	SNDX	Entinostat	Breast Cancer	Phase III - Top-Line Results	4Q18
Synlogic, Inc.	SYBX	SYNB1618	Phenylketonuria (PKU)	Phase I SAD/MAD - Top-Line Results	2H18
Synlogic, Inc.	SYBX	SYNB1020	Urea Cycle Disorders and Derangements (UCD)	Phase Ib/IIa (Cirrhotic Patients) - Top-Line Results	2H18
Synthetic Biologics, Inc.	SYN	Ribaxamase	Clostridium difficile-Associated Diarrhea/Infection (CDAD/CDI)	End-of-Phase II Meeting w/FDA	2H18
Tocagen, Inc.	TOCA	Toca 511	Brain Cancer (Malignant Glioma; AA and glioblastoma (GBM))	Phase I Toca 7 - Top-Line Results	2H18
Tocagen, Inc.	TOCA	Toca 511	Brain Cancer (Malignant Glioma; AA and glioblastoma (GBM))	Phase III Toca5 - Top-Line Results	2H18
Viking Therapeutics, Inc.	VKTX	VK2809	Dyslipidemia / Hypercholesterolemia	Phase II - Top-Line Results	2H18
Viking Therapeutics, Inc.	VKTX	VK2809	Non-Alcoholic Steatohepatitis (NASH)	Phase II - Top-Line Results	2H18
Viking Therapeutics, Inc.	VKTX	VK2809	Glycogen Storage Disease (GSD)	Proof-of-Concept Study - Top-Line Results	2H18
Xenon Pharmaceuticals, Inc.	XENE	XEN1101	Partial Seizures (Epilepsy)	Phase Ib TMS Effects - Top-Line Results	2H18

Note: Market cap: \$50-\$300M

Source: Noble Capital Markets, Biomed Tracker, Company filings



NOBLE CAPITAL MARKETS

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- At the market Offerings (ATM’s)
- PIPEs/Private Sale Offerings

DEBT CAPITAL MARKETS

- Senior Debt
- Mezzanine
- Convertible Debt
- Bridge Financings

ADVISORY SERVICES

- Merger & Acquisitions
- Fairness Opinions
- Valuation Services

SELECT HEALTHCARE TRANSACTIONS

<div> (TSE: PMN) \$7,200,000 Private Placement (CAD) U.S. Placement Agent  May 2018</div>	<div> (FBIO) \$26,000,000 At-The-Market Offering (ATM) Agent  April 2018</div>	<div> (HRTX) \$156,000,000 Follow-on offering Co-Manager  March 2018</div>	<div> (CRBP) Advisory Financial Advisor  December 2017</div>
<div> (VBIV) \$71,900,000 Financial Advisor  October 2017</div>	<div> (HRTX) \$172,500,000 Follow-on Offering Co-Manager  January 2017</div>	<div> (LJPC) \$111,400,000 Follow-on Offering Co-Manager  September 2015</div>	<div> (CYNA) \$72,450,000 Initial Public Offering (IPO) Sole Co-Manager  June 2015</div>



VALUATION SERVICES

NOBLE's Valuation and Advisory Services team specializes in providing business and intangible asset valuations, fairness opinions, financial and strategic analysis, and transaction support services covering a broad spectrum of industries and situations from early stage, middle market and Fortune 500 companies and capital market constituents. NOBLE's team is made up of professionals with numerous accreditations and bring excellence in accounting, taxation, and financial due diligence to provide companies with valuation advice for a multitude of purposes.

Valuation – NOBLE's professionals have significant experience in the valuation of privately owned and public businesses across a wide range of industries. We perform an extensive analysis of the business as well as evaluate industry trends and various other factors in order to inform our clients as to the likely range of value they can expect. Our services are characterized by intellectual and analytical rigor and our conclusions are backed by thorough documentation.

Chief Accounting Officers, Corporate Controllers, CFOs, and Corporate Boards rely on Noble's experienced valuation professionals to produce sophisticated, supportable, and timely valuations to assist in complying with financial reporting requirements, including:

- Purchase price allocation and fresh start accounting
- Goodwill and long-lived asset impairment testing
- Tangible asset valuation
- Fair Value measurement of financial assets & liabilities

Opinions - Whether our clients are looking to fulfill their fiduciary duties, mitigate risk or determine corporate value, we are there throughout the transaction process to offer objective advice based on rigorous analysis. We work on behalf of boards of directors, investors, trustees and other corporate leaders to advise and provide opinions on a wide range of transactions.

We have advised Corporate Boards, special transaction committees, independent trustees, management and other fiduciaries of middle market public and private companies on the financial aspects of a transaction. Our independent advice withstands scrutiny from shareholders, bondholders, the SEC, IRS, or counterparties to a transaction

MERCHANT BANKING

Our Principal Investment focus is primarily on private and small-cap public (\$10mm to \$50mm market caps) companies in industries within NOBLE's research verticals. Investments are made directly by NOBLE and its affiliates and may also involve syndicate participants. We work to identify those companies with game-changing or superior products and technologies that have management teams with proven track-records of success. NOBLE structures investments to meet a company's capital needs whether its growth capital, liquidity or debt repayment. Capital commitment ranges from \$200k to \$2mm principal and \$2mm above with syndicate.

The scope of our Merchant Banking activities includes:

- Targeting domestic companies within our areas of focus and expertise
- Analyzing a company's opportunities and assessing its risks within their respective industry
- Structuring, negotiating and executing the transaction
- Work in assessing the appropriate time and manner in which to harvest the investment

NOBLE's Merchant Banking Team works continuously with our portfolio companies to assist the management team and Board of Directors to create value and grow their businesses to facilitate long-term shareholder value. Through our extensive sector research coverage, institutional investor non-deal road shows, equity conferences and market making, we blend a powerful mix of capital markets acumen to procure success.



INVESTMENT BANKING TEAM

Nathan Cali, Managing Director, Head of Healthcare and Merchant Banking
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- More than 13 years of combined healthcare, biotechnology, and pharmaceutical experience.
- Previously a sell-side analyst for 9 years.
- Co-founder of Variant Pharmaceuticals; and early stage biotechnology advancing orphan drugs for the treatment of renal diseases.
- Began his career in healthcare at Andrx Corporation.
- B.S., The Florida State University. M.B.A., Nova Southeastern University

Austin Shircliff, Analyst
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- Joined Noble Capital Markets as an Analyst in 2018.
- Previously worked in Institutional Sales and Trading Division of Noble Capital Markets, Inc
- B.S. Investment Management, Lynn University

LIFE SCIENCE ADVISORY BOARD

Jules A. Musing, Chairman
Life Sciences Advisory Board Member

- Former Global Head of Biotechnology Licensing and Business Development at Johnson & Johnson
- Over 36 years' experience in the biotechnology and pharmaceutical industry

Dr. James Mulé
Life Sciences Advisory Board Member

- Associate Center Director for Translational Research Director of Cell-based Therapies at the Moffitt Cancer Center
- Serves on the advisory boards of several NCI-designated Cancer Centers and was a member of the NCI Director’s Board of Scientific and Clinical Counselors

Josée E. Leysen, PhD.
Life Sciences Advisory Board Member

- 36 years as a Scientist with over 230 peer reviewed full research papers and 66 reviews and book chapters
- Former member of the Research Management Board and Vice president of Business Development at Janssen Pharmaceutical

Dr. Camillo Ricordi
Life Sciences Advisory Board Member

- Stacy Joy Goodman Professor of Surgery, Distinguished Professor of Medicine, the University of Miami (UM)
- Co-founder and chairman of the National Diabetes Research Coalition

Michael Lerner, JD.
Life Sciences Advisory Board Member

- Chair of Lowenstein Sandler's Life Sciences Group
- Former VP and General Counsel at Reliant Pharmaceuticals, Inc. led product acquisitions and dispositions totaling in excess of \$650 million

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