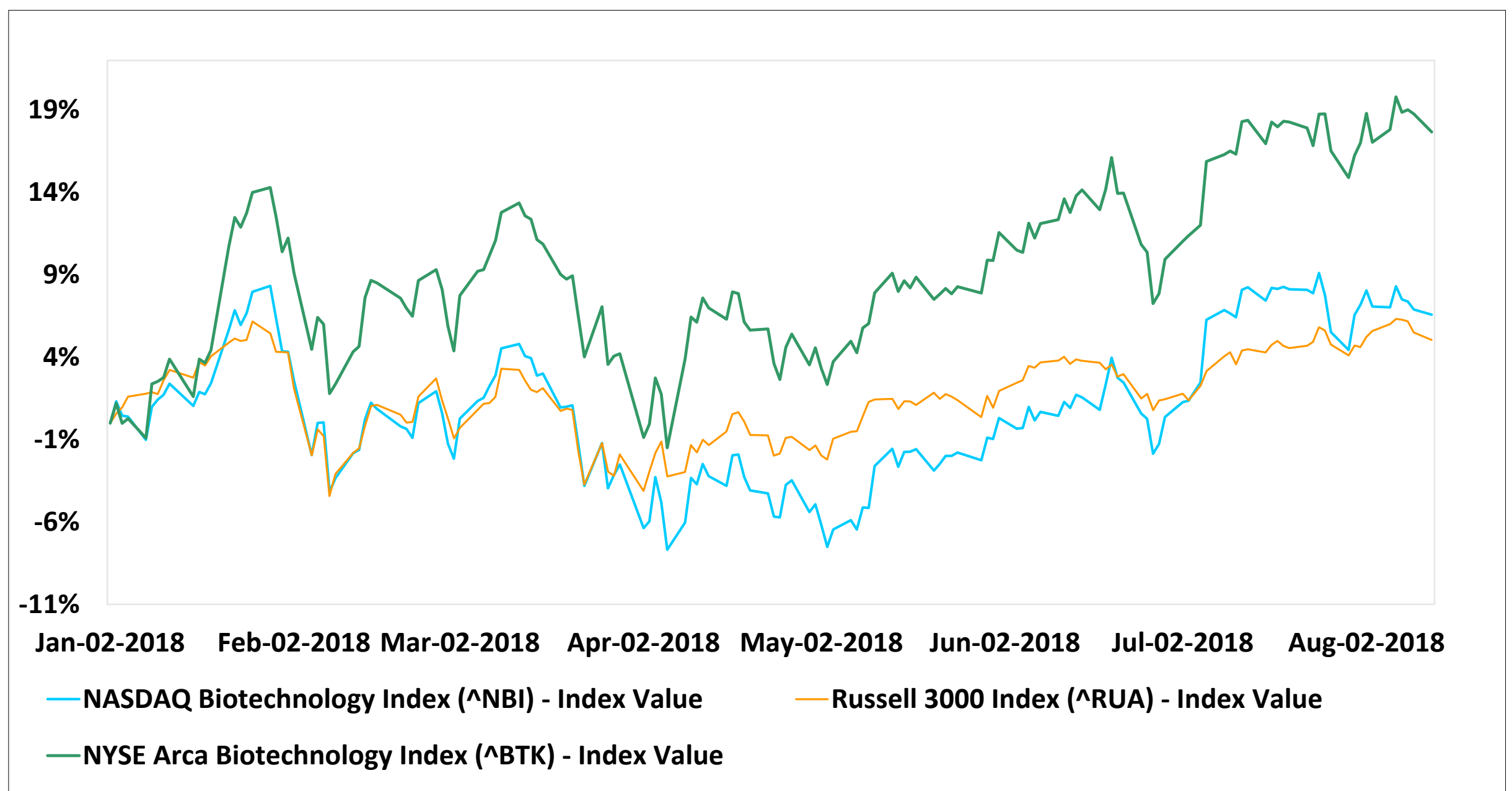


HEALTHCARE SECTOR REVIEW

NOBLE LIFE SCIENCE PARTNERS - BIOTECHNOLOGY INDUSTRY BIWEEKLY

Stock Performances: NYSE Arca Biotechnology (BTK, +18%) and NASDAQ Biotechnology (NBI, +7%) indices outperformed benchmark indices S&P 500 (SP50, +6%) and Russell 3000 (RUA, 5%) YTD 2018.

Biotechnology Relative Price Performance, YTD 2018



Source: Noble Capital Markets, Bloomberg

NOBLE International Investments, Inc., dba NOBLE Capital Markets is a FINRA registered broker/dealer. Member - SPIC (Securities Investor Protection Corporation). Refer to the segment analysis part of the Newsletter to see the components of NOBLE HEALTHCARE Segment Indexes



FINANCING

Public biotech financing experienced a weak year in 2017, however capital raised in 1H18 (\$4.6B) has already exceeded the whole year 2017 (\$4.2B) (Exhibit 5). Licensing deals remained flat with 218 deals in 1H18 compared to 216 deals in 1H17 (Exhibit 6). The number of M&A deals involving public biotech companies increased, whereas it declined in the private biotech world (+25%, -87%, respectively). The M&A deal volume remained flat throughout 2017-18 timeline following a strong year in 2016. In 2017, there was a decrease in the total number of M&A deals and financings relative to prior year. In contrast, 1H18 showed a strong rebound in financing activities (Exhibit 7).

FDA APPROVALS

Food and Drug Administration (FDA) approved 46 drugs in 2017 reaching a 22-year high. There have been 26 drug approvals in YTD-2018, including AGIO’s Tibsovo for treatment of acute myeloid leukemia (AML) and ARRY’s Mektovi and Braftovi for melanoma (Exhibit 12).

IMPORTANT CATALYSTS IN 2H18

Company	Ticker	Drug	Catalyst	Date
Verastem, Inc.	VSTM	Duvelisib	PDUFA for NDA - First Review	10/5/2018
Allergy Therapeutics plc	AGY:LON	Pollinex Quattro Birch	Phase 3 data readout	2H18
Leap Therapeutics	LPTX	TRX518 (anti-GITR)	Phase 1 topline clinical data readout	2H18
Kura Oncology, Inc.	KURA	Tipifarnib	Phase II - Top-Line Results	2H18

Extended catalyst list of biotech companies with market cap of \$50mln to \$300mln can be found on page 32-34.



BIOTECH SECTOR TRENDS

Recent news:

Mustang Bio inked a licensing agreement with St. Jude Children's Research Hospital for the development of an ex vivo lentiviral gene therapy, that is currently in Phase 1/2 trial for infants under age of 2 with X-linked severe combined immunodeficiency disease. (August 13, 2018)

Alnylam received the first RNAi gene silencing therapeutic approval by The Food and Drug Administration (FDA) for treatment of hereditary transthyretin amyloidosis (hATTR), setting the pricing bar to \$450,000. (August 10, 2018)

Gemphire Therapeutics Inc. (GEMP) shares plunged (-68%) on August 10 following termination of Phase 2 clinical trial on the use of gemcabene for the treatment of pediatric patients with non-alcoholic fatty liver disease (NAFLD). The failure was due to worsening clinical conditions of treated patients relative to the control group. (August 10, 2018)

Kyowa Hakko Kirin Co. Ltd.'s Poteligeo was approved for the treatment of cutaneous T-cell lymphoma (CTCL), becoming the sixth targeted therapy in the landscape. (August 08, 2018)

On the regulatory front: Recent FDA guidelines include:

[Oncology Drugs and Biologics Guidance \(August 2018\):](#)

Over sixty thousand clinical trials are conducted in oncology surpassing any other disease, breast cancer is the leading indication with 7,700 studies.

To minimize regulatory burden in early clinical development and to establish time and cost efficiency, FDA recommends the use of a single clinical protocol including multiple expansion cohorts with identified patient cohort-specific objectives.

Identify biomarkers by using in vitro diagnostic (IVD) assays was strongly recommended in early stages of clinical development.

Pediatric specific indications require additional protocol submission with detailed toxicity and pharmacokinetic (PK) assessments.

[Biosimilar Action Plan \(BAP, July 2018\):](#)

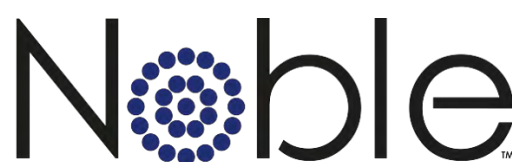
Since the first approval (Neupogen) in 2015, 12 biosimilars were approved by FDA; however only 4 (Zarxio, Inflectra, Renflexis, Fulphila) of them were launched. This shows challenges remain in the biosimilar industry.

European Medicines Agency (EMA) implemented automatic substitution for generic drugs resulting in a 70% price decline in small molecule drugs and a 66% decline in biologics. Twenty-two biosimilars were approved since 2006 by EMA.

The guidance anticipates statutory pathway to approval by implementing standardized reviews, creating resources and development tools, establishing physician education, and providing clarity and flexibility on interchangeable products. These efforts on clarity of scientific and regulatory pathway for biosimilars ease the regulatory burden to microcap biotechnology companies, such as *Dyadic International, Inc.* (DYAI), *PfEnex Inc.* (PFNX). DYAI employs C1 fungal expression technology for development of biologics, providing cost and time efficient production compared to CHO expression system. PFNX implements recombinant protein expression technology accelerating the production of biologics.

[Guidance for Early Alzheimer's Disease \(February 2018\):](#)

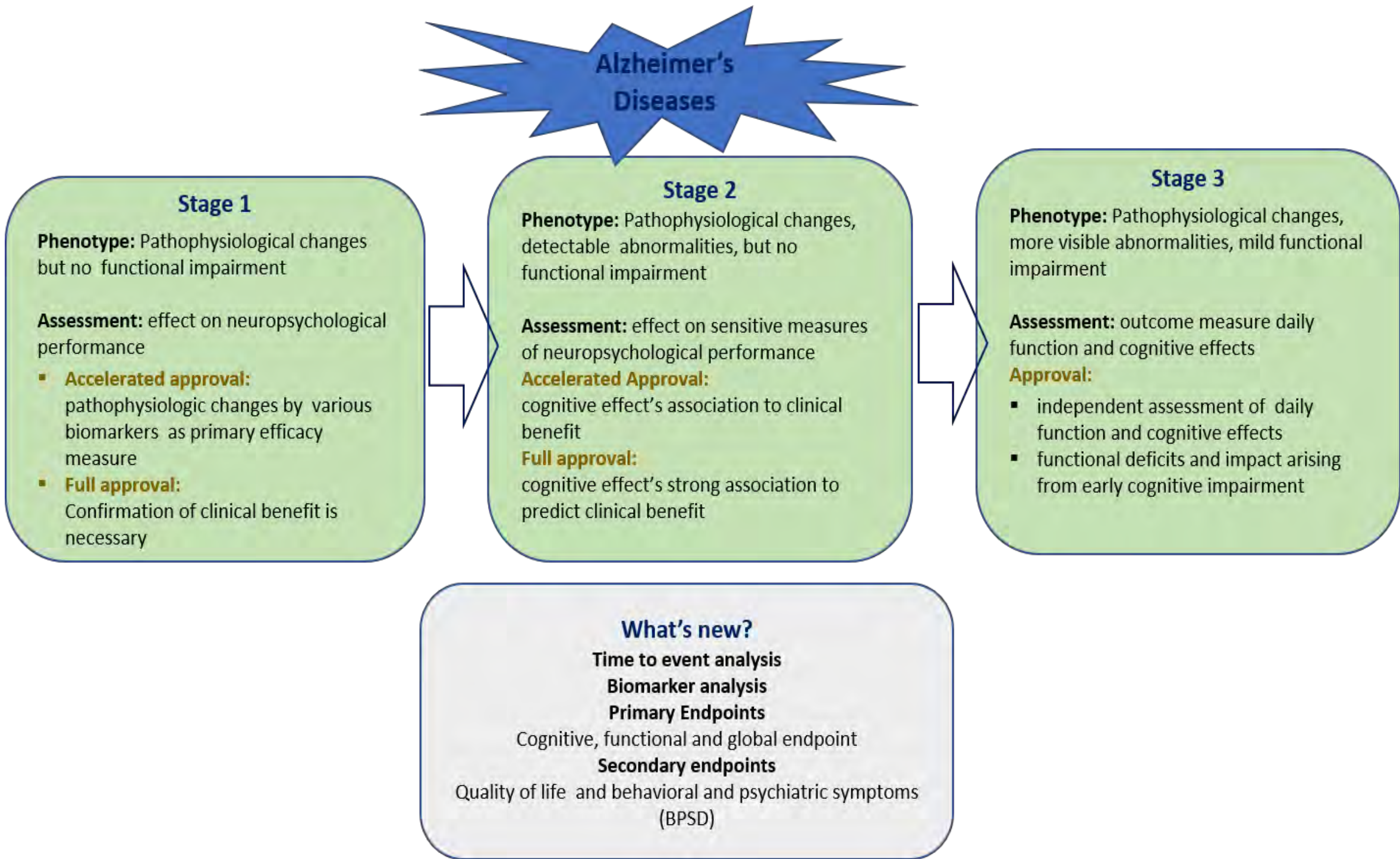
Following almost 10 years without regulatory guidance or drug approvals, FDA and EMA published guidelines on treatment of early stage Alzheimer's disease (AD).



NOBLE Life Science Partners

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WHAT IS NEW IN THE ALZHEIMER DISEASE SPACE



Source: Noble Capital Markets, FDA, EMA



WHAT IS NEW IN THE ALZHEIMER DISEASE SPACE (CONTINUED)

The agency proposed the use of **biomarkers** to aid drug development process and implemented an **accelerated approval** program. Emerging biotech companies in the space such as *Oryzon Genomics* (ORY), *Rodin Therapeutics* (Private, targeting HDAC) could benefit from the recent developments. Both companies are developing novel epigenetic targeted therapies. ORY is currently assessing ORY2001 (LSD1/MAO-B inhibitor) in mild/moderate AD patients and Rodin's HDAC inhibitor is at preclinical stage.

On the clinical front:

Neurological - Alzheimer's Disease

Biogen (BIIB) and Eisai (TYO:4523)'s Phase 2 [data](#) of BAN2401 (anti-amyloid antibody) for the treatment of early AD patients (856 patients, 18 months of follow-up) was presented at the Alzheimer's Association International Conference (AAIC) in July 2018. Promising results in the high dose cohort were met with investors' enthusiasm (BIIB stock initially climbed 20% on July 5). However, the shares declined 11% after the company presented oral data at AAIC on July 25, 2018. The share price decline was triggered by concerns related to:

- Primary endpoint was not met by using the initially identified statistical model (Bayesian) and was changed to another model (ADCOMS)
- Patients treated with lower doses of BAN2401 showed worse cognitive functions than the patients in the placebo arm

Despite the controversy, high dose (10mg/kg) demonstrated statistically significant improvement in cognitive function measured by ADAS-cog and ADCOMS models in 18 months. This result could catalyze renewed investors' enthusiasm in AD arena.

Alzheimer's anti-amyloid- β ($A\beta$) antibody (Ab) development has faced many late stage clinical failures in the last decade, BAN2401 data provides clinical support to amyloid hypothesis in AD. Abs differ based on their epitopes and recognition of $A\beta$ confirmations (monomer, oligomer, protofibrils, fibrils), BAN2401 targeting protofibrils and aducanumab (an earlier stage compound by Biogen) targeting oligomer and fibril confirmations of $A\beta$. Emerging companies targeting $A\beta$ include *ProMIS* (TSE:PMN) and *Cognition Therapeutics* (Private) targeting oligomer forms of β -amyloid, which is thought to be critical for the mechanism causing the disease. ProMIS's lead compound PMN310 is at preclinical stage and anticipated to start Phase 1 study in 2H19.



ONCOLOGY

BeiGene (BGNE) presented results from a clinical trial on the use of zanubrutinib (irreversible Bruton's tyrosine kinase (BTK) inhibitor) for the treatment of Chronic lymphocytic leukemia (CLL) at European Hematology Association (EHA). CLL landscape is rapidly evolving. It is currently dominated by Abbvie (ABBV)'s ibrutinib (60% frontline use), however 50% of the patients develop resistance by acquiring mutation BTK-C481S. Thus, there is a need for second generation BTK inhibitors. Promising candidates medicines in development include:

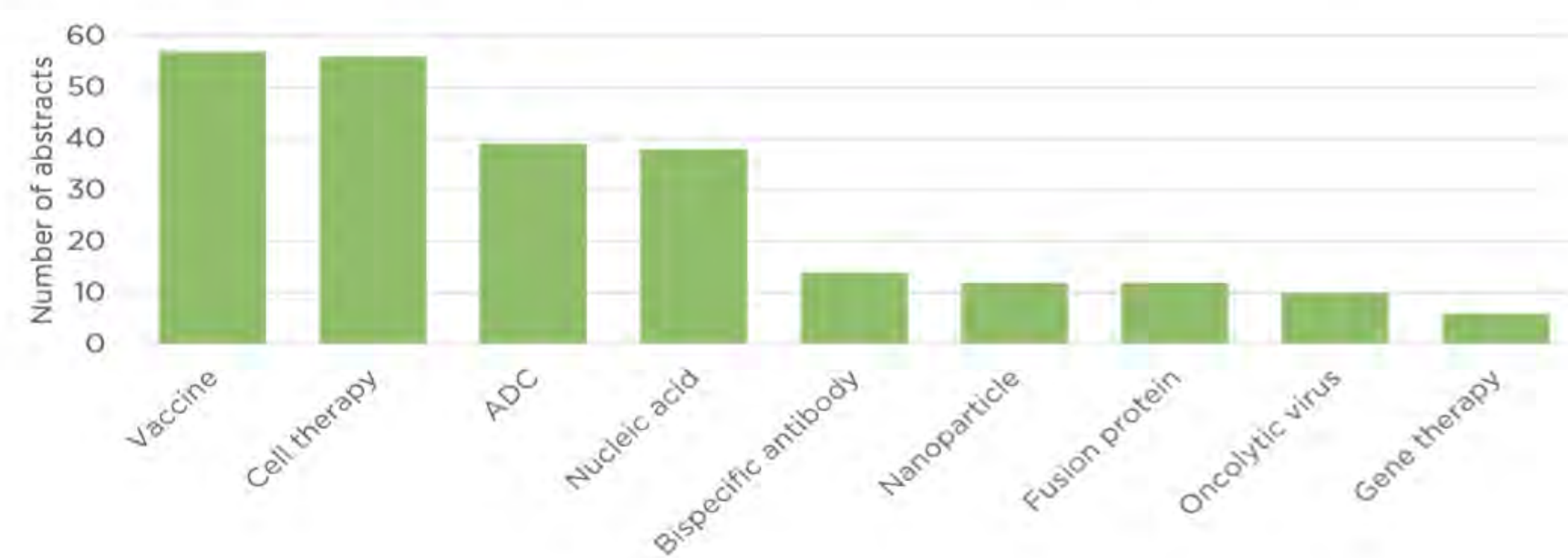
- *Verastem (VSTM)*'s PI3K inhibitor, which is under NDA submission (PDUFA on October)
- *ArQule Inc. (ARQL)*, *Sunesis Pharmaceuticals (SNSS)* and *Aptose Biosciences (APTO)*'s reversible second generation BTK inhibitors, targeting refractory and resistance ibrutinib patients, are under development (data is expected at ASH 2018).

Whereas Bristol Myers (BMJ) and Merck (MRK) continue to dominate the checkpoint inhibitor market, emerging biotechnology companies are developing next generation anti-cancer drugs. At present, thousands of clinical trials combine anti-PD1/PDL1 backbone therapy with various modalities; such as oncolytic viruses, vaccines, cell and gene therapies, tyrosine kinase inhibitors and chemotherapy. The abstracts presented at the 2018 American Society of Clinical Oncology (ASCO) meeting were also focused on these various modalities. At the forefront of clinical discussions, oncologists focused on lung cancer, which was the topic with the most abstracts at the conference.

ONCOLOGY (CONTINUED)

Modalities and Indications Presented at ASCO

	Lung cancer	Skin cancer	Breast cancer	Lymphoma	Ovarian cancer	Leukemia	Multiple myeloma (MM)	Prostate cancer	Liver and biliary cancer	Cervical cancer	Epithelial cancer	Brain cancer	Colorectal cancer	Sarcoma	Head and neck cancer	Gastric cancer	Renal cancer
Vaccine	11	14	4	3	6	2	8	2	4	1	6	2	2				
Cell therapy	3	8	2	14	2	10	8	1	3	4	1	3	2	3	1	2	
ADC	9		16	6	7	2	4	1	2	1	2	1			5		
Nucleic acid	14	1	4	1	2	2		4	1			2	6	1		2	
Bispecific antibody	2	2			2	2	2							1		1	
Nanoparticle	2		3		1	1	3	1									
Fusion protein	3	1	2	2				1		1				1			
Oncolytic virus	1	6										1					
Gene therapy	3	1			1					1						1	

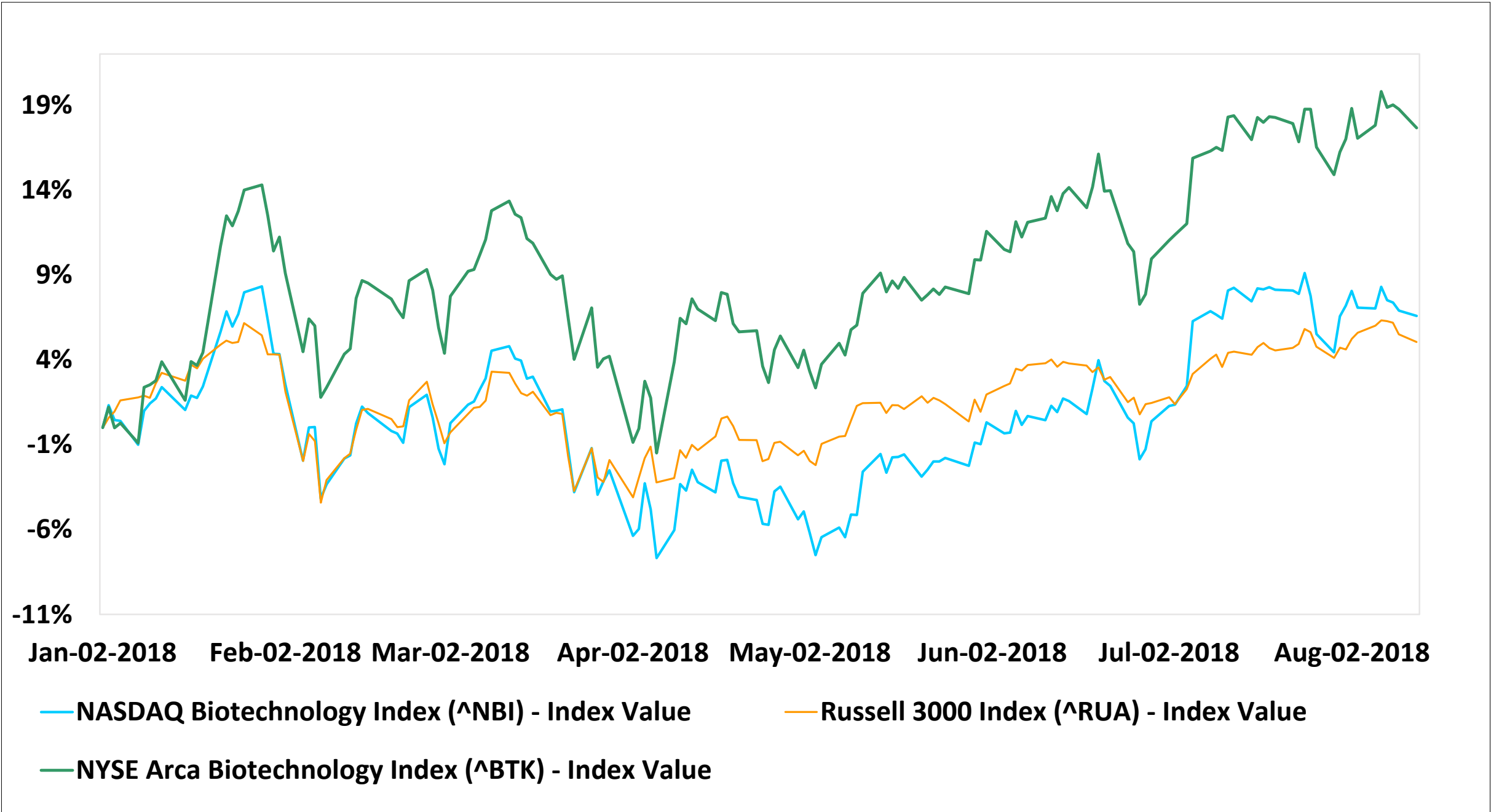


Source: Noble Capital Markets, BioCentury

Potential Emerging companies in immuno-oncology (I/O) landscape include Vyriad (Private, oncolytic virus, Phase 1) and Curadev (Private, targeted therapy, tumor metabolism, preclinical), iTeos Therapeutics (Private, adenosine and TIGIT antagonist, STING agonist, preclinical), Spring Bank Pharmaceuticals (SBPH, STING agonist, preclinical).

MARKET DYNAMICS

Exhibit 1: Biotechnology Relative Price Performance, YTD 2018

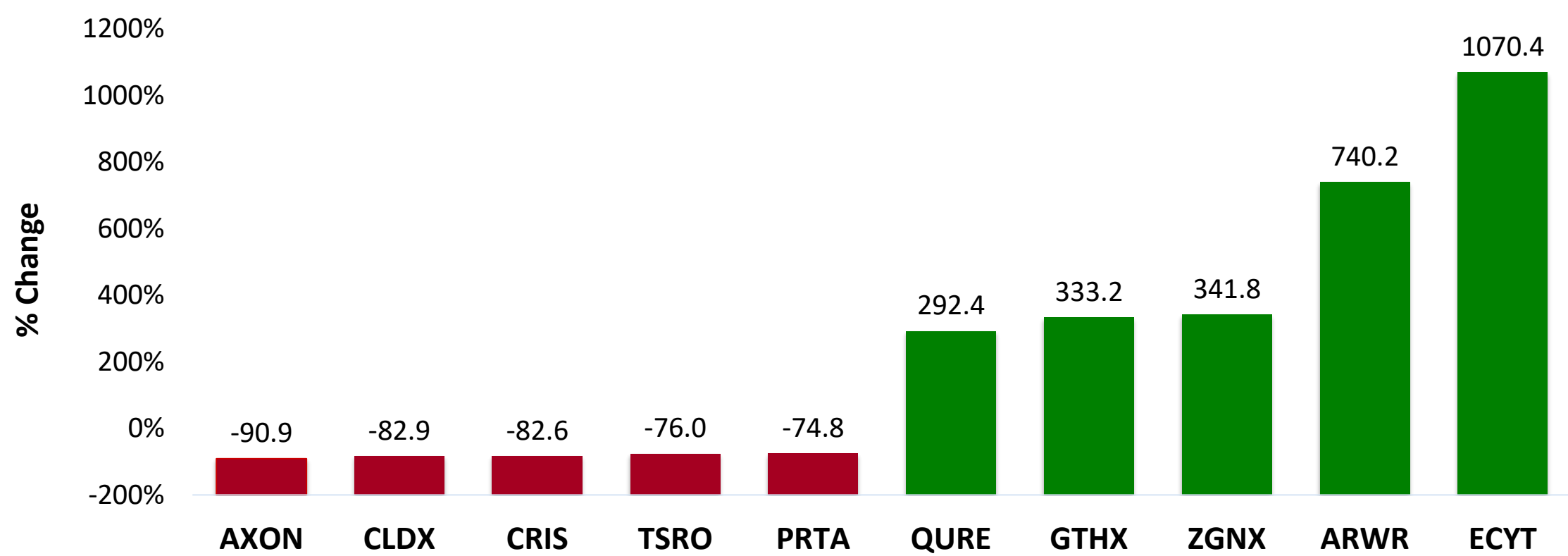


Source: Noble Capital Markets, Bloomberg

Performance on a 12-month trailing basis is skewed toward the relatively larger capitalization universe found in the BTK index (+18%), which is also an index of 30 stocks compared to the 100+ components in the NBI. Notable stock price performances in the BTK (in alphabetical order) include Intercept Pharmaceutical (ICPT, +90%), Illumina (ILMN, +65%), Neurocrine Biosciences (NBIX, +49%), Seattle Genetics (SGEN, +38%) and Ultragenyx (RARE, +65%).

MARKET DYNAMICS (CONTINUED)

Exhibit 2: Top/Bottom 5 Small Cap Stock Performance, YTD 2018



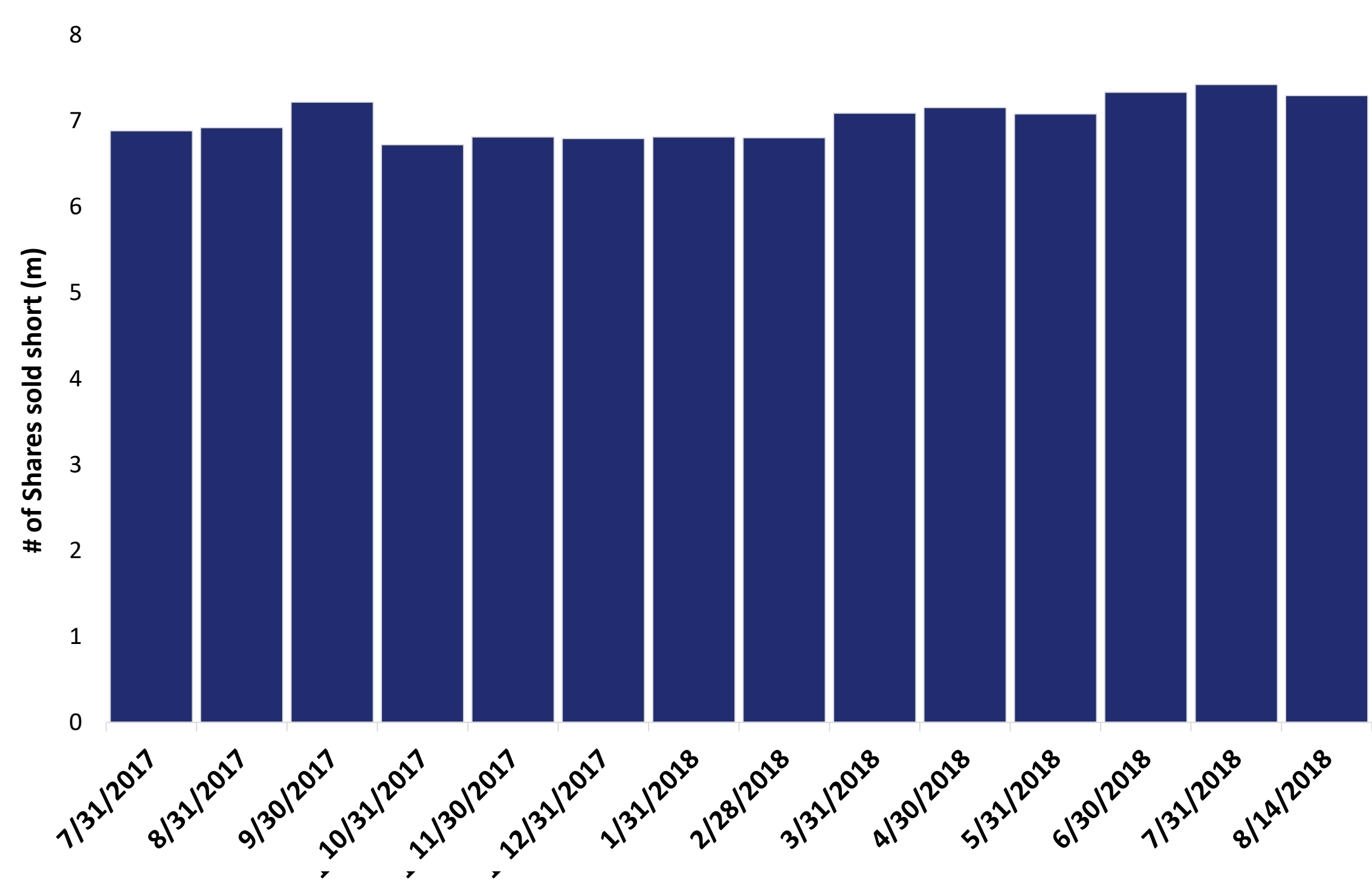
Source: Noble Capital Markets, Bloomberg

Top stock performers of NBI index include UniQure (QURE, +292%), G1 Therapeutics (GTHX, +333%), Zogenix (ZGNX, +342%), Arrowhead (ARWR, +740%) and Endocyte (ECYT, +1040%) ; bottom performers include Axovant Sciences (AXON, -91%), Celldex Therapeutics (CLDX, -83%), Curis (CRIS, -83%), Tesaro (TSRO, -76%) and Prothena (PRTA, -75%).



MARKET DYNAMICS (CONTINUED)

Exhibit 3: Biotechnology Short Interest, as of 8/14/18

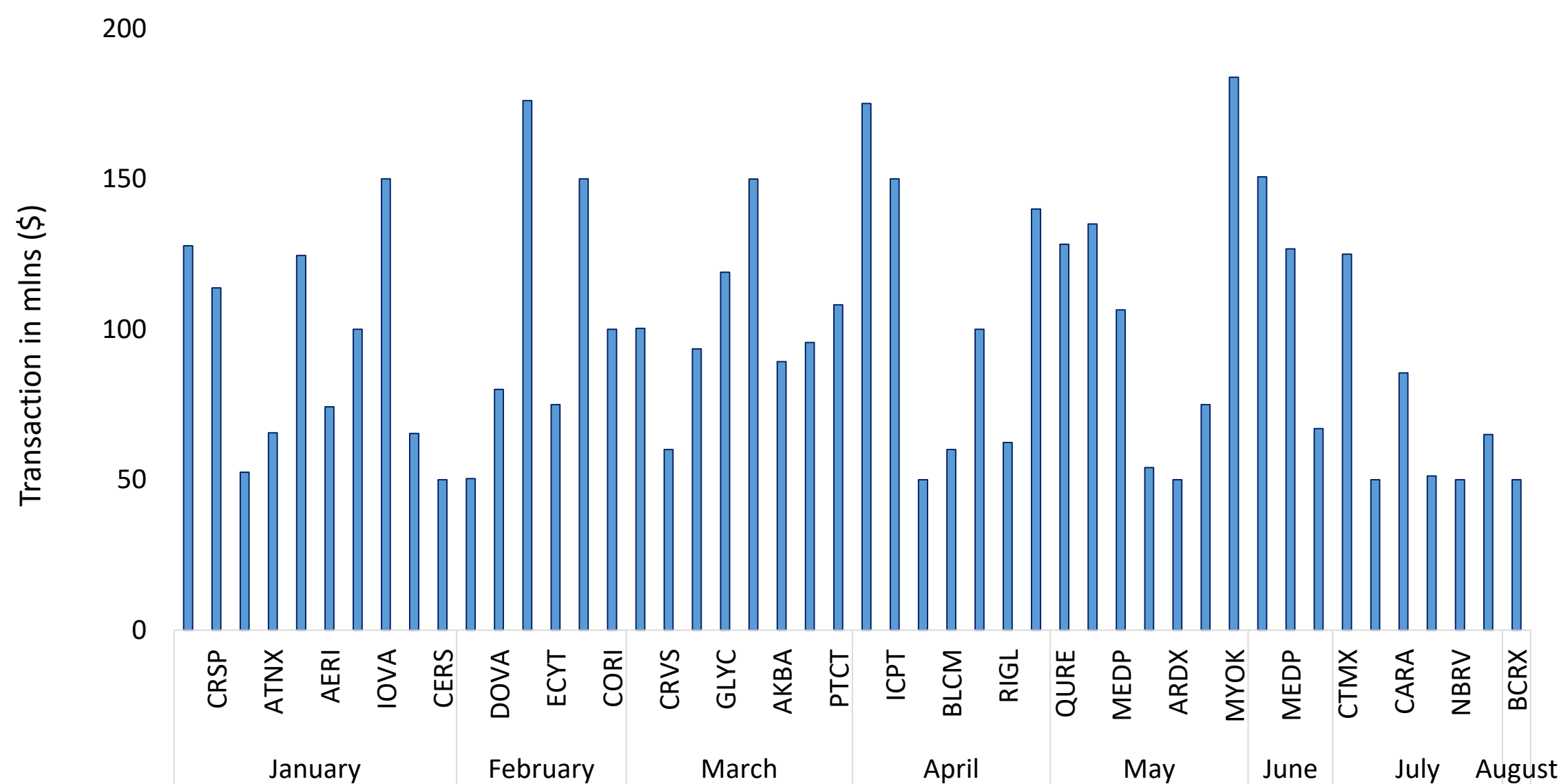


Source: Noble Capital Markets, Capital IQ

Stocks with highest short interest are Opko Health Inc. (OPK), Geron Corporation (GERN) and TherapeuticsMD Inc. (TXMD).

MARKET DYNAMICS - FINANCING

Exhibit 4: YTD Biotech Financings, as of 08/07/2018

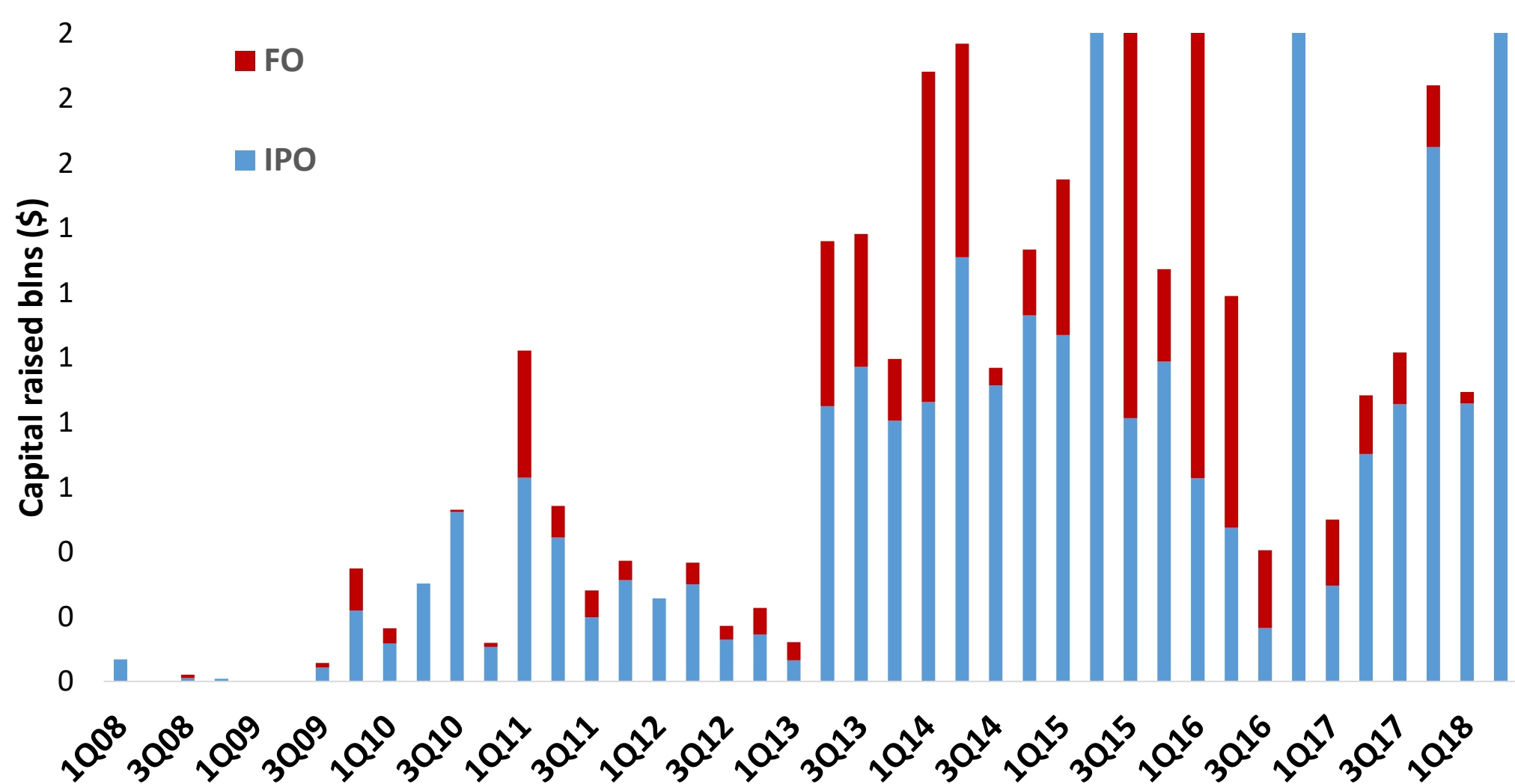


Source: Noble Capital Markets, Capital IQ

In 48 transactions ranging from \$50-\$200 mln in YTD 2018, 48% raised more than \$100 mln. The largest transactions include MyoKardia Inc. (MYOK), Cellectics S.A. (CLLS) and Iovance Biotherapeutics (IOVA).

MARKET DYNAMICS – FINANCING (CONTINUED)

Exhibit 5: Biotech Financings—IPO and Follow-on Capital Raised by Quarter

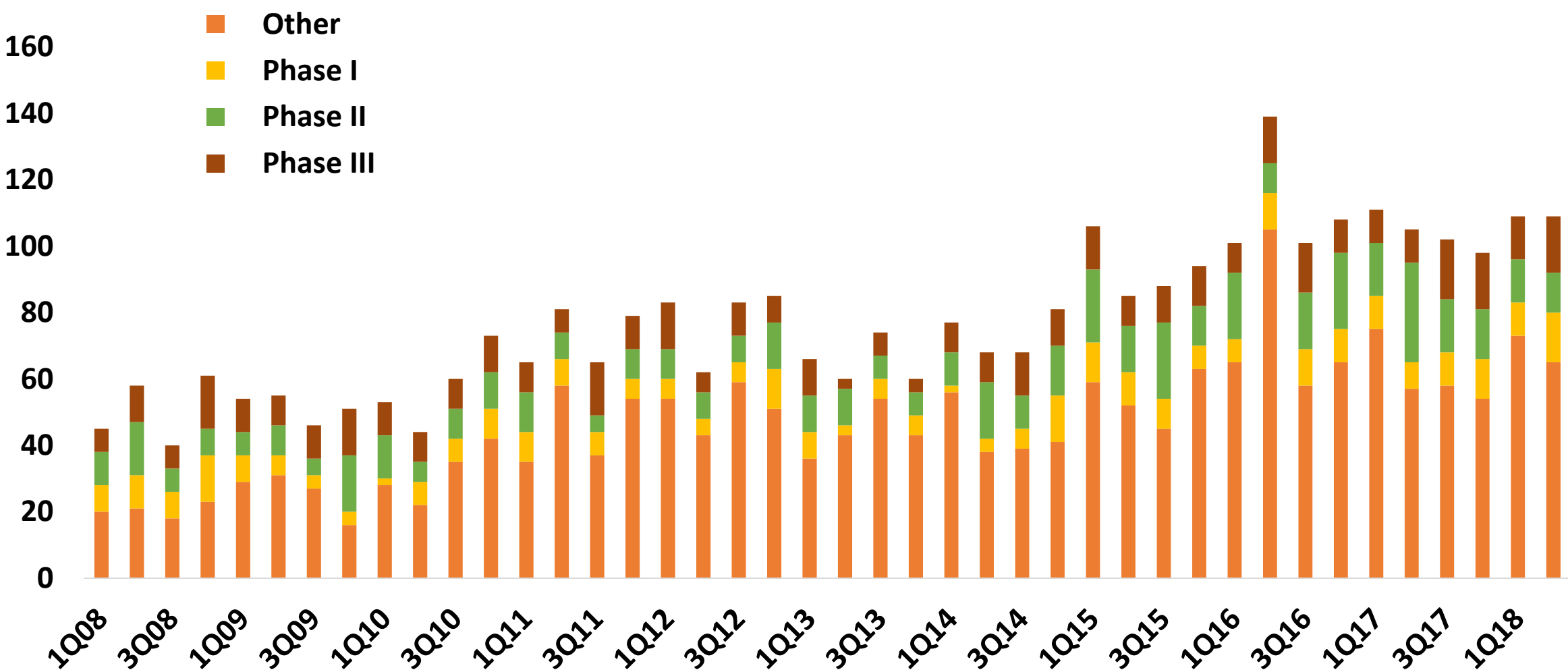


Source: Noble Capital Markets, Bloomberg

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 (CONTINUED)

Exhibit 6: Biotech Licensing Deals

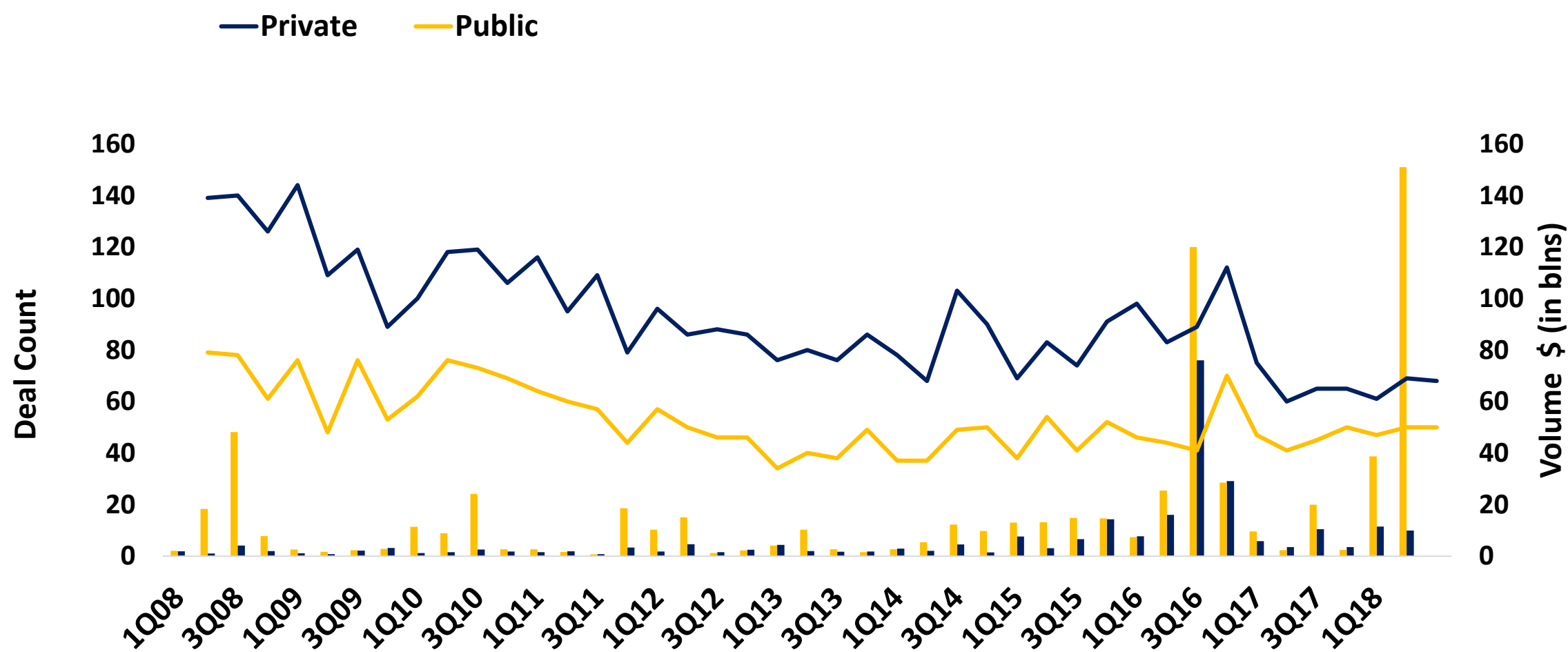


Source: Noble Capital Markets, Bloomberg

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

MARKET DYNAMICS – FINANCING (CONTINUED)

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%) increase compared to the highest quarter of 3Q16.

LOCK-UP EXPIRATIONS

Exhibit 8: IPO and Follow-On Lock-Up Expiration Data for 2018

Company Name	Offer Type	Size (M)	Lock-up Exp.	Restricted shares
Evoform Biosciences Inc	Follow-on	39.9	08/20/2018	N/A
Pfenex Inc	Follow-on	43.0	08/21/2018	N/A
Onconova Therapeutics Inc	Follow-on	19.8	08/25/2018	N/A
Sesen Bio Inc	Follow-on	46.0	08/29/2018	N/A
Vericel Corp	Follow-on	74.8	08/30/2018	N/A
PolarityTE Inc	Follow-on	54.5	09/03/2018	N/A
Deciphera Pharmaceuticals Inc	Follow-on	197.8	09/05/2018	N/A
Viking Therapeutics Inc	Follow-on	77.6	09/05/2018	N/A
ADMA Biologics Inc	Follow-on	40.0	09/06/2018	N/A
Bluebird Bio Inc	Follow-on	632.5	09/08/2018	N/A
Arcus Biosciences Inc	IPO	138.0	09/11/2018	35.3
Immunomedics Inc	Follow-on	276.0	09/11/2018	N/A
CytomX Therapeutics Inc	Follow-on	143.7	09/11/2018	N/A
Achieve Life Sciences Inc	Follow-on	4.5	09/13/2018	N/A
iBio Inc	Follow-on	3.9	09/20/2018	N/A
Homology Medicines Inc	IPO	165.6	09/24/2018	27.1
Aerpio Pharmaceuticals Inc	Follow-on	45.0	09/24/2018	N/A
Unum Therapeutics Inc	IPO	69.2	09/25/2018	N/A
ArQule Inc	Follow-on	69.6	10/09/2018	N/A
SELLAS Life Sciences Group Inc	Follow-on	14.4	10/10/2018	N/A
Assembly Biosciences Inc	Follow-on	165.6	10/10/2018	N/A
Oragenics Inc	Follow-on	3.0	10/11/2018	N/A
Surface Oncology Inc	IPO	108.0	10/16/2018	N/A
Cara Therapeutics Inc	Follow-on	98.3	10/17/2018	N/A
Veracyte Inc	Follow-on	58.9	10/24/2018	N/A
Savara Inc	Follow-on	48.9	10/24/2018	N/A
Cellectar Biosciences Inc	Follow-on	16.6	10/25/2018	N/A
ContraFect Corp	Follow-on	10.0	10/25/2018	N/A
UNITY Biotechnology Inc	IPO	85.0	10/30/2018	36.9
Evelo Biosciences Inc	IPO	85.0	11/05/2018	N/A
Kiniksa Pharmaceuticals Ltd	IPO	170.7	11/20/2018	N/A
Scholar Rock Holding Corp	IPO	86.3	11/20/2018	19.1
Iterum Therapeutics plc	IPO	80.0	11/21/2018	7.7148

Source: Noble Capital Markets, Bloomberg

LOCK-UP EXPIRATIONS (CONTINUED)

Exhibit 8: IPO and Follow-On Lock-Up Expiration Data for 2018

Company Name	Offer Type	Size (M)	Lock-up Exp.	Restricted shares
Trovagene Inc	Follow-on	9.1	12/05/2018	N/A
MeiraGTx Holdings plc	IPO	75.0	12/05/2018	22.2
Eidos Therapeutics Inc	IPO	122.2	12/17/2018	24.2
Aptinyx Inc	IPO	117.8	12/18/2018	N/A
Magenta Therapeutics Inc	IPO	100.0	12/18/2018	N/A
Kezar Life Sciences Inc	IPO	86.3	12/18/2018	12.3
Avrobio Inc	IPO	114.7	12/18/2018	N/A
ElectroCore LLC	IPO	89.7	12/19/2018	23
Neon Therapeutics Inc	IPO	100.0	12/24/2018	N/A
Translate Bio Inc	IPO	126.3	12/25/2018	35.4
Forty Seven Inc	IPO	112.6	12/25/2018	N/A
Rubius Therapeutics Inc	IPO	277.3	01/14/2019	66.9
Crinetics Pharmaceuticals Inc	IPO	117.3	01/14/2019	17.0
Allakos Inc	IPO	147.7	01/15/2019	33.7
Constellation Pharmaceuticals	IPO	60.0	01/15/2019	21.7
Replimune Group Inc	IPO	100.5	01/16/2019	24.1
Provention Bio Inc	IPO	63.9	01/20/2019	11.4
Liquidia Technologies Inc	IPO	50.0	01/22/2019	10.6
Adial Pharmaceuticals Inc	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
August			
European Society of Cardiology	8/25/2018	8/29/2018	Munich, Germany
September			
Pain Week	4-Sep-18	9/8/2018	Las Vegas, NV
Annual International Partnering Conference: BioPharm America	5-Sep-18	6-Sep-18	Boston, MA
American Heart Association (AHA) Council on Hypertension Scientific Sessions	6-Sep-18	9-Sep-18	Chicago, IL
BioCentury: Newsmakers in the Biotech Industry	7-Sep-18	7-Sep-18	New York, NY
ECCO - European Cancer Summit	7-Sep-18	9-Sep-18	Vienna, Austria
Nordic Life Science Days	10-Sep-18	12-Sep-18	Malmo, Sweden
The Retina Society Annual Scientific Meeting	12-Sep-18	15-Sep-18	San Francisco, CA
IASP - International Association for the Study of Pain - World Congress on Pain	12-Sep-18	16-Sep-18	Boston, MA
HFSA - Heart Failure Society of America - Annual Scientific Meeting	15-Sep-18	18-Sep-18	Nashville, TN
ERS International Congress	15-Sep-18	19-Sep-18	Paris, France
HFSA - The Heart Failure Society Annual Meeting	15-Sep-18	18-Sep-18	Nashville, Tennessee
World Conference on Lung Cancer (WCLC)	23-Sep-18	26-Sep-18	Toronto, Canada
ASTRO - American Society for Radiation Oncology - Annual Meeting	24-Sep-18	27-Sep-18	San Diego, CA
Discovery on Target (CHI)	25-Sep-18	28-Sep-18	Boston, MA
October			
EASD Diabetes Meeting	1-Oct-18	5-Oct-18	Berlin, Germany
IDWeek - Infectious Disease Week	3-Oct-18	7-Oct-18	San Francisco, CA
International Parkinson and Movement Disorder Society	5-Oct-18	9-Oct-18	Hong Kong, China
ACG - American College of Gastroenterology - World Congress	5-Oct-18	10-Oct-18	Philadelphia, PN
ACCP - American College of Chest Physicians (CHEST)	6-Oct-18	10-Oct-18	San Antonio, TX
HCV - International Symposium on Hepatitis C Virus and Related Viruses	8-Oct-18	11-Oct-18	Dublin, Ireland
ECTRIMS - European Committee for Treatment and Research in Multiple Sclerosis - Congress	10-Oct-18	12-Oct-18	Berlin, Germany
Annual Digital Healthcare Innovation Summit	11-Oct-18	11-Oct-18	Boston, MA
American Society of Dermatological Surgery	11-Oct-18	14-Oct-18	Phoenix, Arizona
ESGCT - European Society of Gene & Cell Therapy - Annual Congress	16-Oct-18	19-Oct-18	Lausanne, Switzerland
ASHG - American Society of Human Genetics - Annual Meeting	16-Oct-18	20-Oct-18	San Diego, CA
Australian Microcap Investment Conference	17-Oct-18	18-Oct-18	Melbourne, Australia
Annual BIO Investor Forum	17-Oct-18	18-Oct-18	San Francisco, CA
North American Cystic Fibrosis Conference	18-Oct-18	20-Oct-18	Colorado, CO
ESMO - European Society for Medical Oncology	19-Oct-18	23-Oct-18	Munich, Germany
ACR/ARHP - American College of Rheumatology Annual Meeting	19-Oct-18	24-Oct-18	Chicago, IL
UEG Week Vienna 2018	20-Oct-18	24-Oct-18	Vienna, Austria
ANA - American Neurological Association - Annual Meeting	21-Oct-18	23-Oct-18	Atlanta, GA
Life Sciences Summit	24-Oct-18	25-Oct-18	New York, NY
Society of Melanoma Research	24-Oct-18	27-Oct-18	Manshester, England
Ophthalmology Innovation Summit - AAO	25-Oct-18	25-Oct-18	Chicago, IL
ASN - American Society of Nephrology Kidney Week	25-Oct-18	28-Oct-18	San Diego, CA
AAO - American Academy of Ophthalmology - Annual Meeting	27-Oct-18	30-Oct-18	Chicago, IL
World Vaccine Congress Europe	29-Oct-18	31-Oct-18	Lisbon, Portugal

Note: Major conferences are shown in bold.

Source: Noble Capital Markets, Biomed Tracker

SELECTED INDUSTRY CONFERENCES (CONTINUED)

Exhibit 9: Medical, Scientific and Industry Conferences for 2018

Event	Start Date	End Date	Location
November			
AMP - Association for Molecular Pathology - Annual Meeting	1-Nov-18	3-Nov-18	San Antonio, TX
SfN - Society for Neuroscience - Annual Meeting	3-Nov-18	7-Nov-18	San Diego, CA
AAPS - American Association of Pharmaceutical Scientists - PharmSci 360	4-Nov-18	7-Nov-18	Washington, DC
World Orphan Drug Congress Europe	6-Nov-18	8-Nov-18	Barcelona, Spain
SITC's Annual Meeting & Associated Program	7-Nov-18	11-Nov-18	Washington, DC
AASLD - The Liver Meeting	9-Nov-18	13-Nov-18	San Francisco, CA
AHA - American Heart Association - Scientific Sessions	10-Nov-18	14-Nov-18	Chicago, IL
AAPS - Annual Meeting and Expositions	12-Nov-18	15-Nov-18	San Diego, CA
ObesityWeek	12-Nov-18	15-Nov-18	Nashville, TN
Biotech and Money Invâ,~\$tival Showcase	13-Nov-18	13-Nov-18	London, UK
TEDMED Conference	14-Nov-18	16-Nov-18	Palm Springs, CA
EORTC/NCI/AACR - Symposium on Molecular Targets and Cancer Therapeutics	13-Nov-18	16-Nov-18	Dublin, Ireland
SNO - Society for Neuro-Oncology - Annual Scientific Meeting	15-Nov-18	18-Nov-18	New Orleans, LA
ACAAI - American College of Allergy, Asthma & Immunology - Annual Meeting	15-Nov-18	19-Nov-18	Seattle, WA
AES - American Epilepsy Society - Annual Meeting	30-Nov-18	4-Dec-18	New Orleans, LA
December			
ASH - American Society of Hematology - Annual Meeting and Exposition	1-Dec-18	4-Dec-18	San Diego, CA
EUROGIN - International multidiciplinary HPV Conference	2-Dec-18	5-Dec-18	Lisbon, Portugal
SABCS - San Antonio Breast Cancer Symposium	4-Dec-18	8-Dec-18	San Antonio, TX
American College of Neuropsychopharmacology	9-Dec-18	13-Dec-18	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	Indication	Company	Ticker
Stanate	22-Aug-18	Hyperbilirubinemia	Mallinckrodt plc	MNK
Inveltys	24-Aug-18	Ocular Pain and/or Inflammation (Ophthalmology)	Kala Pharmaceuticals, Inc.	KALA
Lusutrombopag	24-Aug-18	Thrombocytopenia	Shionogi & Co. Ltd.	4507:JP
Altreno	27-Aug-18	Acne	Bausch Health Companies Inc.	BHC
Eravacycline	28-Aug-18	Intra-Abdominal Infections (Antibacterial)	Tetraphase Pharmaceuticals, Inc.	TTPH
Waylivra	30-Aug-18	Dyslipidemia / Hypercholesterolemia	Akcea Therapeutics, Inc.	AKCA
Dasotraline	30-Aug-18	Attention Deficit Hyperactivity Disorder (ADHD)	Sumitomo Dainippon Pharma Co., Ltd.	4506:JP
Pefcalcitol	Before 08/31/2018	Psoriasis	Maruho Co., Ltd.	-
Ryplazim	Before 08/31/2018	Hypoplasminogenemia	ProMetic Life Sciences Inc.	PLI:CN
Xyosted	28-Sep-18	Hypogonadism	Antares Pharma, Inc.	ATRS
Arikayce	28-Sep-18	Respiratory Tract Infections (Excluding Pneumonia)	Insmed, Inc.	INSM
Remune	Before 09/30/2018	HIV / AIDS	Immune Response BioPharma, Inc.	-
LR769	Before 09/30/2018	Hemophilia A and B - General Clotting Products	LFB Group	-
Omadacycline	2-Oct-18	Skin and Skin-Structure Infections (Antibacterial)	Paratek Pharmaceuticals, Inc.	PRTK
Barhemsys	5-Oct-18	Emesis	Acacia Pharma Group plc	ACPH:BB
Inbrija	5-Oct-18	Parkinson's Disease (PD)	Acorda Therapeutics, Inc.	ACOR
Jemdel	5-Oct-18	Psoriasis	Bausch Health Companies Inc.	BHC
Tegsedi	5-Oct-18	Transthyretin (TTR)-related Hereditary Amyloidosis	Ionis Pharmaceuticals, Inc.	IONS
Duvelisib	5-Oct-18	CLL/SLL	Verastem, Inc.	VSTM
Dsuvia	2-Nov-18	Moderate to Severe Pain	AcelRx Pharmaceuticals, Inc.	ACRX
Biosimilar				
Pegfilgrastim	2-Nov-18	Neutropenia / Leukopenia	Coherus BioSciences, Inc.	CHRS
Olinvo	2-Nov-18	Acute Pain	Trevena, Inc.	TRVN
Revefenacin	13-Nov-18	Chronic Obstructive Pulmonary Disease (COPD)	Theravance Biopharma, Inc.	TBPH
Aemcolo	16-Nov-18	Gastroenteritis	Cosmo Pharmaceuticals N.V.	COPN:S
Emapalumab	20-Nov-18	Inflammatory Disorders	Swedish Orphan Biovitrum	W
Larotrectinib	26-Nov-18	Solid Tumors	SOBI:SS	LOXO
Firdapse	28-Nov-18	Lambert-Eaton Myasthenic Syndrome (LEMS)	Loxo Oncology, Inc.	CPRX
XaraColl	30-Nov-18	Postsurgical Pain	Catalyst Pharmaceuticals Inc.	-
CAM2038	26-Dec-18	Substance Use Disorder	Innocoll AG	-
Dextenza	28-Dec-18	Ocular Pain and/or Inflammation (Ophthalmology)	Apple Tree Partners	-
VivaGel	28-Dec-18	Urinary Tract and Reproductive Tract Infections (Antibacterial)	Ocular Therapeutix, Inc.	OCUL
Tbria	YE18	Osteoporosis / Osteopenia	Starpharma Holdings Limited	SPL:AU
			Tarsa Therapeutics, Inc.	-

Source: Biomed Tracker, FDA



FDA APPROVALS (CONTINUED)

Exhibit 11: Upcoming Advisory Committee Meeting Dates

Committee Name	Tentative Dates
Pediatric Advisory Committee	September 20 and 21, 2018
Science Board to the Food and Drug Administration	October 22, 2018 November 7, 2018
Allergenic Products Advisory Committee	
Blood Products Advisory Committee	November 29 and 30, 2018 October 3 or November 8, 2018
Vaccines and Related Biological Products Advisory Committee	
Pharmacy Compounding Advisory Committee	September 12, 2018
Neurological Devices Panel	September 27, 2018
Patient Engagement Advisory Committee	November 2018
Science Advisory Board to NCTR	December 4-5, 2018
Tobacco Products Scientific Advisory Committee	September 13-14, 2018

Source: Biomed Tracker, FDA

FDA APPROVALS (CONTINUED)

Exhibit 12: Selected Recently Approved Drugs and Biologics, YTD

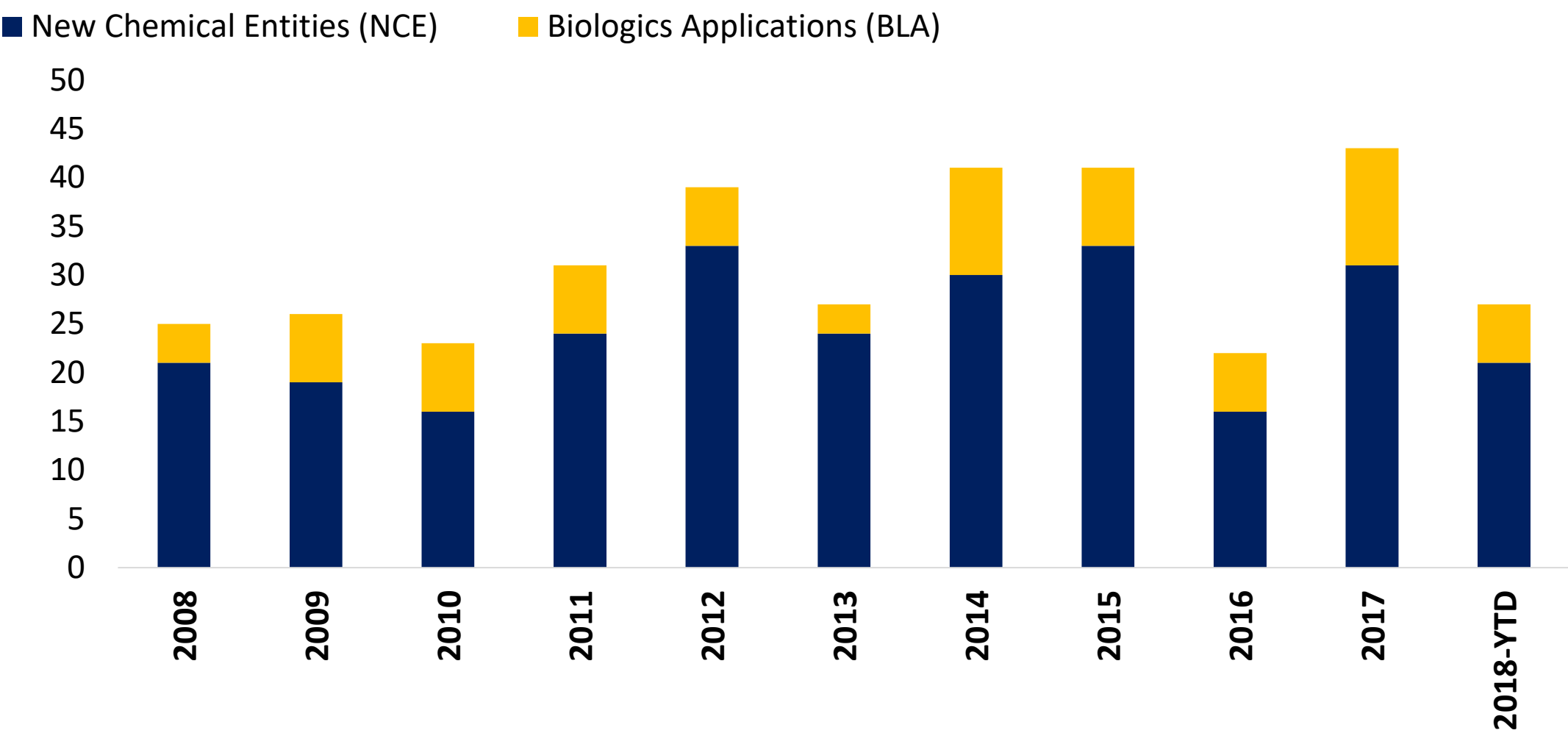
Drug	Approval Date	Indication	Company	Ticker
Galafold	10-Aug-2018	Fabry disease	Amicus Therapeutics, Inc.	FOLD
Annovera	10-Aug-2018	Vaginal ring to prevent pregnancy	TherapeuticsMD, Inc.	TXMD
Onpattro	10-Aug-2018	Polyneuropathy of hereditary transthyretin-mediated amyloidosis	Alnylam Pharmaceuticals,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

Source: Noble Capital Markets, Biomed Tracker, FDA

30 drugs were approved in YTD-2018, twenty of which are new molecular entities (NMEs).

DRUG LANDSCAPE

Exhibit 13: New FDA Drug Approvals

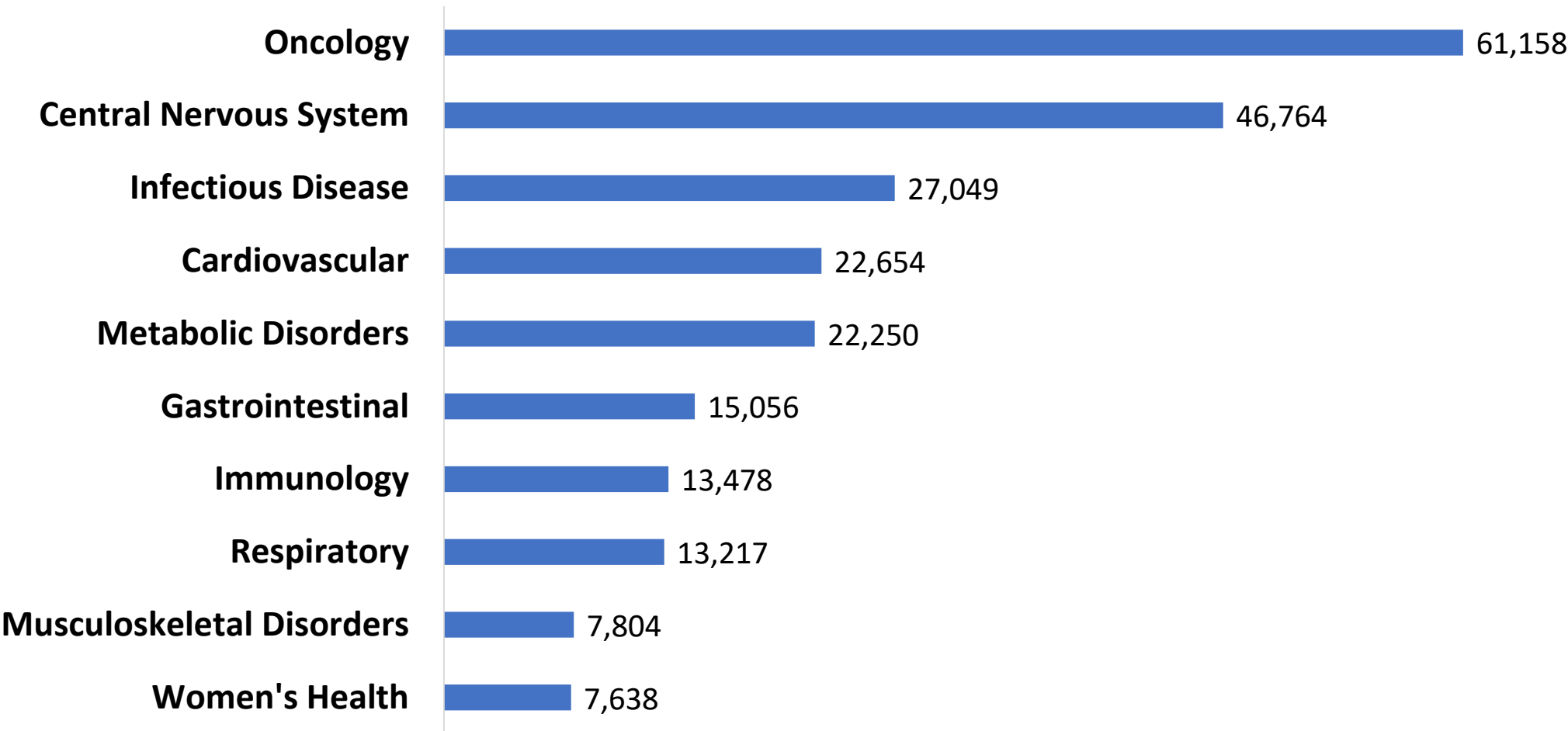


Source: Noble Capital Markets, Bloomberg

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

DRUG LANDSCAPE (CONTINUED)

Exhibit 14: Number of Drugs in the Pipeline

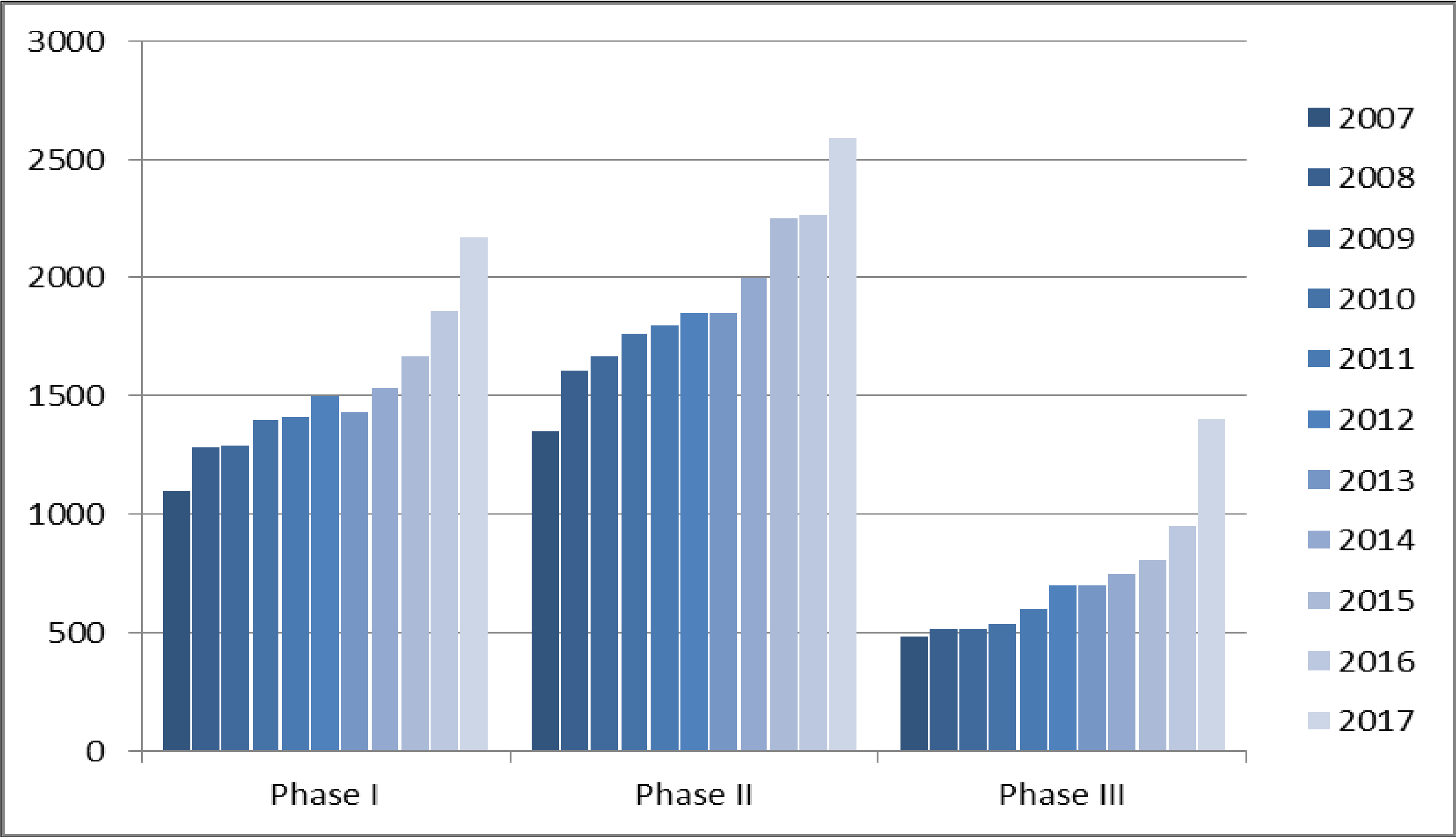


Source: Noble Capital Markets, Global Data Intelligence

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.

DRUG LANDSCAPE (CONTINUED)

Exhibit 15: Number of Ongoing Trials in Each Clinical Phase



Source: Evaluate Pharma

Human clinical trials across all phases (Phase 1,2 and 3 trials) reached to the highest numbers in 2017, surpassing prior years.

APPENDIX

Exhibit 16: Cash Analysis, sorted by Multiple of Cash

Company	Ticker	Market Cap in (\$mm)	Cash (\$mm)	Shares Outstanding (mm)	Cash/Sh are \$	Enterprise Value	EV/Cash
Shire plc	SHPG	51835.3	259.7	909.4	0.3	68914.7	265.4x
PetIQ, Inc.	PETQ	439.4	4.7	13.8	0.3	634.3	134.5x
Medpace Holdings, Inc.	MEDP	2022.0	22.2	36.6	0.6	2190.9	98.6x
Mylan N.V.	MYL	19354.4	390.2	524.4	0.7	33651.4	86.2x
PRA Health Sciences, Inc.	PRAH	6504.7	123.2	63.3	1.9	7688.5	62.4x
Syneos Health, Inc.	SYNH	5042.6	172.8	99.7	1.7	7773.0	45.0x
OPKO Health, Inc.	OPK	3017.2	80.4	559.5	0.1	3146.5	39.1x
Bio-Techne Corporation	TECH	6676.9	181.8	37.5	4.8	6834.1	37.6x
Grifols, S.A.	GRFS	17341.0	780.5	684.7	1.1	23599.2	30.2x
Seattle Genetics, Inc.	SGEN	11718.8	448.0	149.6	3.0	11270.8	25.2x
Teligent, Inc.	TLGT	222.7	13.7	53.4	0.3	338.5	24.8x
Celgene Corporation	CELG	64688.3	3417.0	755.4	4.5	82558.3	24.2x
Alexion Pharmaceuticals, Inc.	ALXN	26379.8	1186.1	222.8	5.3	28398.5	23.9x
Regeneron Pharmaceuticals, Inc.	REGN	39556.5	1683.5	107.3	15.7	38578.9	22.9x
Arrowhead Pharmaceuticals, Inc.	ARWR	1434.8	60.5	80.3	0.8	1376.1	22.8x
Biogen Inc.	BIIB	68649.7	3224.2	210.4	15.3	71346.7	22.1x
Neurocrine Biosciences, Inc.	NBIX	10480.0	508.7	89.2	5.7	10350.1	20.3x
Veracyte, Inc.	VCYT	465.0	23.8	34.2	0.7	466.5	19.6x
Illumina, Inc.	ILMN	48113.1	2512.0	146.5	17.1	47260.1	18.8x
The Medicines Company	MDCO	2851.6	183.6	73.4	2.5	3330.7	18.1x
Myriad Genetics, Inc.	MYGN	2934.0	157.3	69.1	2.3	2846.1	18.1x
Ironwood Pharmaceuticals, Inc.	IRWD	2905.4	181.2	150.6	1.2	3131.3	17.3x
Depomed, Inc.	DEPO	458.9	57.2	63.3	0.9	981.7	17.2x
Innoviva, Inc.	INVA	1395.7	107.5	103.6	1.0	1776.7	16.5x
Amphastar Pharmaceuticals, Inc.	AMPH	815.5	50.9	46.4	1.1	817.2	16.1x
Vertex Pharmaceuticals Incorporated	VRTX	44735.8	2767.8	252.3	11.0	42589.4	15.4x
Alkermes plc	ALKS	6800.7	433.5	154.3	2.8	6647.6	15.3x
NovoCure Limited	NVCR	3413.4	219.0	90.0	2.4	3343.6	15.3x
NantHealth, Inc.	NH	276.7	29.4	110.3	0.3	445.2	15.1x
ANI Pharmaceuticals, Inc.	ANIP	676.3	55.0	11.6	4.7	826.0	15.0x

Note: Market cap as of 8/14/2018, Cash value for 2Q18

Source: Noble Capital Markets, Capital IQ

APPENDIX

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Company	Ticker	Market Cap in (\$mm)	Cash (\$mm)	Shares Outstanding (mm)	Cash/Sh are \$	Enterprise Value	EV/Cash
Jazz Pharmaceuticals plc	JAZZ	10594.0	816.6	60.0	13.6	11369.1	13.9x
Supernus Pharmaceuticals, Inc.	SUPN	2271.3	174.4	51.4	3.4	2418.8	13.9x
Reata Pharmaceuticals, Inc.	RETA	1899.0	138.7	25.8	5.4	1838.9	13.3x
BioMarin Pharmaceutical Inc.	BMRN	18242.1	1363.1	175.9	7.8	18070.6	13.3x
Athenex, Inc.	ATNX	1150.8	80.7	63.3	1.3	1046.6	13.0x
Puma Biotechnology, Inc.	PBYI	1665.5	134.5	37.6	3.6	1651.3	12.3x
Repligen Corporation	RGEN	2160.1	175.6	43.1	4.1	2085.8	11.9x
Vital Therapies, Inc.	VTL	394.0	31.1	42.3	0.7	362.9	11.7x
Genomic Health, Inc.	GHDX	1926.9	152.9	35.1	4.4	1773.9	11.6x
Eagle Pharmaceuticals, Inc.	EGRX	1187.9	100.2	14.9	6.7	1134.4	11.3x
Omeros Corporation	OMER	931.4	88.4	47.7	1.9	973.3	11.0x
Immunomedics, Inc.	IMMU	4103.3	358.8	136.3	2.6	3945.7	11.0x
Exelixis, Inc.	EXEL	5853.4	499.9	296.0	1.7	5374.8	10.8x
MannKind Corporation	MNKD	176.7	26.2	120.6	0.2	279.9	10.7x
Incyte Corporation	INCY	13789.9	1198.4	210.5	5.7	12616.1	10.5x
Endo International plc	ENDP	3401.5	1098.8	223.5	4.9	10570.0	9.6x
Aerie Pharmaceuticals, Inc.	AERI	2901.0	286.1	37.6	7.6	2738.9	9.6x
BioCryst Pharmaceuticals, Inc.	BCRX	781.0	80.7	94.9	0.9	751.9	9.3x
G1 Therapeutics, Inc.	GTHX	1848.0	188.2	29.8	6.3	1659.8	8.8x
Amarin Corporation plc	AMRN	843.6	102.3	280.2	0.4	882.7	8.6x
Sarepta Therapeutics, Inc.	SRPT	8451.5	949.1	63.9	14.9	7941.8	8.4x
Pacific Biosciences of California, Inc.	PACB	572.6	63.5	122.0	0.5	523.3	8.2x
NanoString Technologies, Inc.	NSTG	415.2	50.7	25.5	2.0	414.3	8.2x
Synergy Pharmaceuticals Inc.	SGYP	436.5	61.2	238.7	0.3	493.2	8.1x
China Biologic Products Holdings, Inc.	CBPO	3141.2	366.2	30.4	12.1	2904.9	7.9x
Spectrum Pharmaceuticals, Inc.	SPPI	2358.9	269.7	96.8	2.8	2128.6	7.9x
Xencor, Inc.	XNCR	2269.3	255.4	49.3	5.2	2013.9	7.9x
Cerus Corporation	CERS	958.1	111.9	120.1	0.9	876.0	7.8x
Neos Therapeutics, Inc.	NEOS	181.0	28.0	28.7	1.0	212.9	7.6x
Coherus BioSciences, Inc.	CHRS	1271.6	159.8	59.2	2.7	1212.8	7.6x

Note: Market cap as of 8/14/2018, Cash value for 2Q18

Source: Noble Capital Markets, Capital IQ

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Company	Ticker	Market Cap in (\$mm)	Cash (\$mm)	Shares Outstanding (mm)	Cash/Sh are \$	Enterprise Value	EV/Cash
GW Pharmaceuticals plc	GWPH	3727.6	440.7	26.9	16.4	3303.9	7.5x
Luminex Corporation	LMNX	1175.0	139.0	43.5	3.2	1036.0	7.5x
Progenics Pharmaceuticals, Inc.	PGNX	682.5	87.5	71.8	1.2	642.7	7.3x
TherapeuticsMD, Inc.	TXMD	1214.7	154.4	213.5	0.7	1133.5	7.3x
REGENXBIO Inc.	RGNX	2313.6	286.5	31.5	9.1	2027.1	7.1x
Akcea Therapeutics, Inc.	AKCA	3082.4	381.9	67.4	5.7	2700.6	7.1x
bluebird bio, Inc.	BLUE	8448.6	1077.0	48.1	22.4	7527.0	7.0x
FibroGen, Inc.	FGEN	5072.7	671.9	81.2	8.3	4534.5	6.7x
Zogenix, Inc.	ZGNX	2078.8	272.1	32.4	8.4	1806.7	6.6x
Accelaron Pharma Inc.	XLRN	2190.6	287.9	44.0	6.5	1902.7	6.6x
Horizon Pharma Public Limited Company	HZNP	3490.9	710.2	164.3	4.3	4665.8	6.6x
AnaptysBio, Inc.	ANAB	1958.0	267.9	22.8	11.7	1701.7	6.4x
PTC Therapeutics, Inc.	PTCT	2015.2	296.1	43.8	6.8	1868.0	6.3x
Array BioPharma Inc.	ARRY	3085.8	438.4	188.5	2.3	2754.8	6.3x
Loxo Oncology, Inc.	LOXO	4843.5	671.0	30.0	22.4	4172.5	6.2x
Ultragenyx Pharmaceutical Inc.	RARE	3838.4	547.1	45.9	11.9	3291.3	6.0x
CRISPR Therapeutics AG	CRSP	2239.9	319.7	43.3	7.4	1920.2	6.0x
BeiGene, Ltd.	BGNE	9371.2	1369.6	48.2	28.4	8224.8	6.0x
Esperion Therapeutics, Inc.	ESPR	1220.1	180.2	26.0	6.9	1040.1	5.8x
Intercept Pharmaceuticals, Inc.	ICPT	3271.9	538.3	26.2	20.5	3096.9	5.8x
DBV Technologies S.A.	DBVT	1100.5	165.6	24.8	6.7	947.8	5.7x
Lexicon Pharmaceuticals, Inc.	LXRX	1156.2	209.7	105.7	2.0	1191.6	5.7x
Endocyte, Inc.	ECYT	1106.2	166.8	53.9	3.1	939.4	5.6x
Ascendis Pharma A/S	ASND	2843.0	429.2	35.2	12.2	2413.8	5.6x
Halozyne Therapeutics, Inc.	HALO	2475.7	398.9	142.3	2.8	2242.9	5.6x
Sage Therapeutics, Inc.	SAGE	6987.5	1092.4	42.2	25.9	5895.1	5.4x
Momenta Pharmaceuticals, Inc.	MNTA	1980.4	310.8	75.4	4.1	1669.6	5.4x
Alnylam Pharmaceuticals, Inc.	ALNY	9155.6	1447.7	97.1	14.9	7737.9	5.3x
Adaptimmune Therapeutics plc	ADAP	814.8	129.0	93.8	1.4	685.8	5.3x
Agios Pharmaceuticals, Inc.	AGIO	4486.9	716.9	52.7	13.6	3770.0	5.3x

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Source: Noble Capital Markets, Capital IQ

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Company	Ticker	Market Cap in (\$mm)	Cash (\$mm)	Shares Outstanding (mm)	Cash/Sh are \$	Enterprise Value	EV/Cash
Enanta Pharmaceuticals, Inc.	ENTA	1684.7	273.2	19.2	14.2	1413.3	5.2x
Pacira Pharmaceuticals, Inc.	PCRX	1923.1	371.3	40.6	9.1	1835.4	4.9x
Ligand Pharmaceuticals Incorporated	LGND	5225.1	1016.7	21.1	48.1	5014.7	4.9x
MyoKardia, Inc.	MYOK	2346.8	398.6	35.6	11.2	1948.2	4.9x
Nektar Therapeutics	NKTR	10229.1	1823.8	161.8	11.3	8651.4	4.7x
Aimmune Therapeutics, Inc.	AIMT	1657.3	290.0	53.2	5.5	1367.3	4.7x
Cara Therapeutics, Inc.	CARA	733.6	132.0	32.8	4.0	601.6	4.6x
Amgen Inc.	AMGN	126612.9	29395.0	704.0	41.8	131714.9	4.5x
Calyxt, Inc.	CLXT	556.4	105.6	27.8	3.8	469.5	4.4x
Kura Oncology, Inc.	KURA	672.1	125.9	29.6	4.2	553.2	4.4x
Amicus Therapeutics, Inc.	FOLD	2706.5	539.0	173.1	3.1	2337.0	4.3x
Savara Inc.	SVRA	382.2	74.9	28.6	2.6	322.6	4.3x
INSYS Therapeutics, Inc.	INSY	554.5	104.9	73.1	1.4	449.6	4.3x
Marinus Pharmaceuticals, Inc.	MRNS	242.3	46.4	33.1	1.4	196.0	4.2x
Iovance Biotherapeutics, Inc.	IOVA	1433.9	276.1	77.7	3.6	1157.8	4.2x
uniQure N.V.	QURE	1316.1	259.2	31.2	8.3	1077.8	4.2x
Alder Biopharmaceuticals, Inc.	ALDR	1306.7	308.6	67.1	4.6	1275.3	4.1x
Global Blood Therapeutics, Inc.	GBT	2350.2	462.5	46.7	9.9	1887.7	4.1x
Theravance Biopharma, Inc.	TBPH	1552.3	352.9	53.1	6.6	1423.7	4.0x
Novavax, Inc.	NVAX	520.3	167.1	331.5	0.5	671.7	4.0x
Dova Pharmaceuticals, Inc.	DOVA	654.6	134.7	26.5	5.1	540.0	4.0x
Blueprint Medicines Corporation	BPMC	3031.3	613.5	41.7	14.7	2418.6	3.9x
Corium International, Inc.	CORI	336.4	82.5	36.1	2.3	324.3	3.9x
Radius Health, Inc.	RDUS	951.8	231.2	44.7	5.2	893.3	3.9x
Vanda Pharmaceuticals Inc.	VNDA	1123.5	231.2	47.1	4.9	892.3	3.9x
Gilead Sciences, Inc.	GILD	100038.6	27103.0	1304.5	20.8	102057.6	3.8x
Portola Pharmaceuticals, Inc.	PTLA	1829.9	435.9	63.9	6.8	1602.6	3.7x
Collegium Pharmaceutical, Inc.	COLL	610.6	133.7	32.0	4.2	488.4	3.7x
United Therapeutics Corporation	UTHR	5344.7	1213.0	43.4	28.0	4381.7	3.6x
AMAG Pharmaceuticals, Inc.	AMAG	873.9	351.2	34.7	10.1	1265.2	3.6x

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Company	Ticker	Market Cap in (\$mm)	Cash (\$mm)	Shares Outstanding (mm)	Cash/Sh are \$	Enterprise Value	EV/Cash
Aratana Therapeutics, Inc.	PETX	245.0	60.0	44.0	1.4	214.6	3.6x
Karyopharm Therapeutics Inc.	KPTI	1090.7	241.1	50.4	4.8	849.6	3.5x
Galapagos NV	GLPG	5570.9	1244.6	51.0	24.4	4353.4	3.5x
Sienna Biopharmaceuticals, Inc.	SNNA	304.7	74.9	18.9	4.0	259.7	3.5x
Geron Corporation	GERN	716.1	160.9	163.4	1.0	555.2	3.5x
Foamix Pharmaceuticals Ltd.	FOMX	241.0	54.2	38.1	1.4	186.8	3.4x
Corbus Pharmaceuticals Holdings, Inc.	CRBP	281.7	64.7	54.4	1.2	217.1	3.4x
Retrophin, Inc.	RTRX	1040.6	255.7	39.3	6.5	830.3	3.2x
Revance Therapeutics, Inc.	RVNC	991.8	233.7	33.5	7.0	758.0	3.2x
Arbutus Biopharma Corporation	ABUS	534.7	154.9	55.1	2.8	500.7	3.2x
Inovio Pharmaceuticals, Inc.	INO	404.4	95.6	89.8	1.1	308.9	3.2x
Acorda Therapeutics, Inc.	ACOR	1317.7	391.7	46.3	8.5	1265.0	3.2x
Audentes Therapeutics, Inc.	BOLD	1312.9	314.4	32.5	9.7	998.4	3.2x
Editas Medicine, Inc.	EDIT	1390.3	344.1	44.2	7.8	1079.1	3.1x
Atara Biotherapeutics, Inc.	ATRA	1714.0	417.0	36.3	11.5	1307.2	3.1x
ImmunoGen, Inc.	IMGN	1359.9	345.1	120.7	2.9	1016.9	2.9x
Intellia Therapeutics, Inc.	NTLA	1196.7	305.5	39.8	7.7	891.1	2.9x
Ionis Pharmaceuticals, Inc.	IONS	6865.1	1980.5	125.8	15.7	5631.6	2.8x
Strongbridge Biopharma plc	SBBP	273.2	92.4	41.7	2.2	256.9	2.8x
Tesaro, Inc.	TSRO	1491.4	575.1	54.5	10.5	1556.2	2.7x
Adamas Pharmaceuticals, Inc.	ADMS	636.5	203.0	24.6	8.2	544.8	2.7x
Ra Pharmaceuticals, Inc.	RARX	346.4	95.1	26.2	3.6	251.3	2.6x
ChemoCentryx, Inc.	CCXI	638.3	182.0	48.9	3.7	471.0	2.6x
Kala Pharmaceuticals, Inc.	KALA	304.9	91.2	18.6	4.9	233.7	2.6x
Clovis Oncology, Inc.	CLVS	1825.4	682.2	50.5	13.5	1717.5	2.5x
Spark Therapeutics, Inc.	ONCE	2197.9	647.2	36.4	17.8	1586.1	2.5x
Rigel Pharmaceuticals, Inc.	RIGL	461.0	135.0	144.5	0.9	326.1	2.4x
Seres Therapeutics, Inc.	MCRB	326.4	96.1	40.6	2.4	230.3	2.4x
Axovant Sciences Ltd.	AXON	252.7	92.9	107.7	0.9	212.8	2.3x
Epizyme, Inc.	EPZM	698.5	215.6	67.0	3.2	482.9	2.2x

Note: Market cap as of 8/14/2018, Cash value for 2Q18

Source: Noble Capital Markets, Capital IQ

APPENDIX

Exhibit 16: Cash Analysis, sorted by Multiple of Cash

Company	Ticker	Market Cap in (\$mm)	Cash (\$mm)	Shares Outstanding (mm)	Cash/Sh are \$	Enterprise Value	EV/Cash
Aclaris Therapeutics, Inc.	ACRS	530.4	164.6	30.4	5.4	366.3	2.2x
CytomX Therapeutics, Inc.	CTMX	1076.4	335.1	38.2	8.8	741.3	2.2x
Arena Pharmaceuticals, Inc.	ARNA	1822.4	592.4	41.6	14.2	1289.8	2.2x
Insmed Incorporated	INSM	1684.9	634.3	73.9	8.6	1357.7	2.1x
Flexion Therapeutics, Inc.	FLXN	906.1	340.5	36.0	9.5	724.8	2.1x
Minerva Neurosciences, Inc.	NERV	327.6	108.5	39.3	2.8	220.6	2.0x
Sangamo Therapeutics, Inc.	SGMO	1616.6	539.4	88.1	6.1	1077.2	2.0x
Aurinia Pharmaceuticals Inc.	AUPH	445.5	150.2	84.1	1.8	295.0	2.0x
Voyager Therapeutics, Inc.	VYGR	574.1	196.1	29.8	6.6	378.0	1.9x
MacroGenics, Inc.	MGNX	870.1	300.9	38.2	7.9	569.2	1.9x
Achaogen, Inc.	AKAO	263.1	100.5	43.5	2.3	187.2	1.9x
Intra-Cellular Therapies, Inc.	ITCI	1128.7	403.8	51.8	7.8	724.9	1.8x
GlycoMimetics, Inc.	GLYC	629.5	229.4	36.2	6.3	400.1	1.7x
Mersana Therapeutics, Inc.	MRSN	291.1	108.0	17.4	6.2	183.1	1.7x
Tocagen Inc.	TOCA	179.2	79.5	19.9	4.0	125.6	1.6x
Collectis S.A.	CLLS	1205.1	491.1	37.5	13.1	765.9	1.6x
NantKwest, Inc.	NK	249.5	104.9	80.4	1.3	151.4	1.4x
Bellicum Pharmaceuticals, Inc.	BLCM	277.9	129.4	35.1	3.7	184.0	1.4x
Nabriva Therapeutics plc	NBRV	177.5	75.5	35.6	2.1	102.6	1.4x
Curis, Inc.	CRIS	52.4	40.4	32.1	1.3	50.5	1.2x
Corvus Pharmaceuticals, Inc.	CRVS	276.8	133.2	23.2	5.7	143.6	1.1x
Concert Pharmaceuticals, Inc.	CNCE	383.8	190.2	23.1	8.2	193.6	1.0x
Avadel Pharmaceuticals plc	AVDL	182.7	147.1	38.7	3.8	148.8	1.0x
Paratek Pharmaceuticals, Inc.	PRTK	306.2	264.0	29.5	9.0	260.7	1.0x
Cytokinetics, Incorporated	CYTK	376.9	231.9	54.0	4.3	177.4	0.8x
Syndax Pharmaceuticals, Inc.	SNDX	168.9	99.8	23.9	4.2	69.1	0.7x
Dermira, Inc.	DERM	407.7	436.9	41.8	10.5	251.0	0.6x
Aduro BioTech, Inc.	ADRO	434.8	289.1	77.2	3.7	145.7	0.5x
Tetraphase Pharmaceuticals, Inc.	TPPH	163.3	111.2	50.6	2.2	52.1	0.5x
Five Prime Therapeutics, Inc.	FPRX	509.1	352.8	30.7	11.5	156.4	0.4x

Note: Market cap as of 8/14/2018, Cash value for 2Q18

Source: Noble Capital Markets, Capital IQ

APPENDIX

Exhibit 16: Cash Analysis, sorted by Multiple of Cash

Company	Ticker	Market Cap in (\$mm)	Cash (\$mm)	Shares Outstanding (mm)	Cash/Sh are \$	Enterprise Value	EV/Cash
Ardelyx, Inc.	ARDX	251.3	212.7	48.9	4.4	87.4	0.4x
Prothena Corporation plc	PRTA	586.4	486.2	38.8	12.5	152.4	0.3x
Achillion Pharmaceuticals, Inc.	ACHN	370.0	286.7	137.9	2.1	83.5	0.3x
Chimerix, Inc.	CMRX	206.0	174.8	47.5	3.7	31.5	0.2x
Calithera Biosciences, Inc.	CALA	166.4	141.4	35.7	4.0	25.0	0.2x
PDL BioPharma, Inc.	PDLI	344.6	395.7	150.1	2.6	69.9	0.2x
Jounce Therapeutics, Inc.	JNCE	261.7	232.7	32.3	7.2	29.0	0.1x
Akebia Therapeutics, Inc.	AKBA	446.1	402.1	50.0	8.0	44.0	0.1x
NewLink Genetics Corporation	NLNK	112.0	137.1	35.3	3.9	-24.9	-0.2x
Celldex Therapeutics, Inc.	CLDX	67.6	114.0	138.6	0.8	-46.4	-0.4x

Note: Market cap as of 8/14/2018, Cash value for 2Q18

Source: Noble Capital Markets, Capital IQ

CATALYST CALENDAR FOR SMALL CAP BIOTECHNOLOGY COMPANIES

Company	Ticker	Drug	Indication	Catalyst	Date
Cellular Biomedicine Group, Inc.	CBMG	C-CAR011	Acute Lymphocytic Leukemia (ALL)	Phase I - CALL-1 - Top-Line Results	Aug-18
Fortress Biotech, Inc.	FBIO	Triplex	Cytomegalovirus (CMV) Infection (Antiviral)	Phase II - Top-Line Results	Aug-18
Innovation Pharmaceuticals Inc.	IPIX	Prurisol	Psoriasis	Phase IIb 005 - Top-Line Results (6-Weeks)	Aug-18
Lipocine Inc.	LPCN	Tlando	Hypogonadism	Meeting with FDA	Aug-18
NewLink Genetics Corporation	NLNK	CRLX101	Solid Tumors	Phase I/II w/Lynparza - Top-Line Results	Aug-18
Novelion Therapeutics Inc.	NVLN	Myalept	Lipodystrophy	sBLA Filing - Subset of PL	Aug-18
Oasmia Pharmaceutical AB	OASM	Paclical	Ovarian Cancer	NDA Filing	Aug-18
Recro Pharma, Inc.	REPH	N1539	Postsurgical Pain	Meeting with FDA	Aug-18
XBiotech, Inc.	XBIT	RA-18C3	Neutrophilic Dermatoses	Phase II - Top-Line Results	Aug-18
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
Correvio 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

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

Source: Noble Capital Markets, Biomed Tracker, Company filings

CATALYST CALENDAR FOR SMALL CAP BIOTECHNOLOGY COMPANIES

Company	Ticker	Drug	Indication	Catalyst	Date
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	Sep-18
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 Non-Hodgkin's Lymphoma	PDUFA for sBLA - First Review	10/25/2018
Affimed N.V.	AFMD	AFM11	(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) Ocular Pain and/or	PDUFA for NDA - Second Review	11/28/2018
Ocular Therapeutix, Inc.	OCUL	Dextenza	Inflammation (Ophthalmology)	PDUFA for NDA - Third Review	12/28/2018
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

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

Source: Noble Capital Markets, Biomed Tracker, Company filings

CATALYST CALENDAR FOR SMALL CAP BIOTECHNOLOGY COMPANIES

Company	Ticker	Drug	Indication	Catalyst	Date
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
Cantargia AB	CANTA:SS	CAN04	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, 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

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

Source: Noble Capital Markets, Biomed Tracker, Company filings

CATALYST CALENDAR FOR SMALL CAP BIOTECHNOLOGY COMPANIES

Company	Ticker	Drug	Indication	Catalyst	Date
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
Marinus Pharmaceuticals, Inc.	MRNS	Ganaxolone	Major Depressive Disorder (MDD)	Phase II Amaryllis - 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

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

Source: Noble Capital Markets, Biomed Tracker, Company filings

CATALYST CALENDAR FOR SMALL CAP BIOTECHNOLOGY COMPANIES

Company	Ticker	Drug	Indication	Catalyst	Date
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
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

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

Source: Noble Capital Markets, Biomed Tracker, Company filings

CATALYST CALENDAR FOR SMALL CAP BIOTECHNOLOGY COMPANIES

Company	Ticker	Drug	Indication	Catalyst	Date
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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NOBLE CAPITAL MARKETS is a research-driven investment and merchant bank focused on small cap, emerging growth companies in the healthcare, technology, HEALTHCARE and natural resources sectors. That's what we are. Who we are is what makes us different.

Our people are talented, dedicated, experienced professionals who come together with a common cause; advising on long-term client solutions by employing innovative, collaborative and responsive strategies. We're passionate and personable. We approach things from our clients' perspective.

We know that developing lasting relationships is reliant upon putting our clients' interests before ours. We understand the impact of our services. Insightful advisory and effective capital procurement can change lives. Empowering our clients to create employment, engineer technological and medical breakthroughs, producing products and services that lay the foundation for the future. For more than 30 years these have been our guiding principles. While much has changed over the three decades since we began, these core values and our reputation have not. Our clients must know what to expect from us. Then we can strive to exceed expectations.

A SIMPLE FORMULA OUR VALUE PROPOSITION.

It starts with research With a fundamental belief that information guides the management process, NOBLE understands that there is no short-path to success. With this as a solid foundation, apply experience and execution delivered by people with passion. This is our formula to add value to your creation.

Research + Experience & Execution + People with Passion = Value

FULL-SERVICE INVESTMENT BANK

- Established 1984.
- Private firm, employee owned.
- Built on commitment to provide value and support for our clients.

FOCUSED INSTITUTIONAL SALES AND TRADING

- Seasoned sales and sales trading team.
- Long standing relationships with premier growth-focused investors.

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- Experience team of Research Analysts covering approximately 100 companies.
- Focus on Technology, HEALTHCARE, Healthcare and Natural Resources.
- Strong Institutional Sponsorship.

INVESTMENT BANKING COMMITMENT

- Proven track record.
- Senior level attention to every client and transaction.
- Ability to deliver complete "mind share" of NOBLE on all transactions.

INVESTMENT BANKING

Our investment banking team, together with our well-recognized equity research analysts and the equity capital markets group, provide our clients with fundamental capital markets advisory and support - prior, during and most importantly, after a transaction. NOBLE’s investment banking team works closely with the management and Board of our corporate clients in order to fully understand operational and financial objectives. With this knowledge our banking team will develop an efficient and effective advisory program which offers a variety of services including:

EQUITY CAPITAL MARKETS

- Secondary and Follow-on Offerings
- Registered Direct Offerings
- Initial Public Offerings
- 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> (AGRX) \$18,800,002 Follow-on Offering Co-manager  August 2017</div>	<div> (HRTX) \$172,500,000 Follow-on Offering Co-Manager  January 2017</div>	<div> (COOL) Advisory Fairness Opinion  January 2017</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 (\$10mill to \$50mill 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 \$2million principal and \$2million 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 Investment Banking Analyst in 2018.
- Previously worked as an institutional equity sales intern and investment banking intern at Noble Capital Markets.
- 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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