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RESEARCH
DEPARTMENT

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Companies mentioned in this report
(price as 12/27/18 market close)

Ticker	Price 12/27/18	MTD Δ
MRNA.O	\$ 13.52	NULL
DNLI.O	\$ 19.85	3.5%
BIIB.O	\$ 295.17	-11.6%
CELG.O	\$ 62.50	-13.5%
MGNX.O	\$ 12.50	-27.4%
IMGN.O	\$ 4.50	-18.3%
LOXO.O	\$ 138.08	-1.7%
NVCR.O	\$ 32.75	-4.6%
ALXN.O	\$ 97.87	-20.5%
REGN.O	\$ 363.29	-0.6%
STIM.O	\$ 19.07	6.9%
BSX	\$ 33.68	-10.6%
DHR	\$ 99.96	-8.7%
ISRG.O	\$ 461.98	-13.0%
IDXX.O	\$ 185.60	-8.9%
HZNP.O	\$ 19.30	-3.4%
SGEN.O	\$ 56.80	-9.2%

What's happening?

- **Moderna Inc. went IPO on 12.7.18.** The stock, ticker: MRNA, started to trade at \$23.00 on NASDAQ with the initial public offering of 26,275,993 shares, and currently traded at \$14.05 with the implied Mkt Cap of \$4.5bn. MRNA collaborates the technology of mRNA (messenger ribonucleic acid) and focuses primarily on vaccine development.
- **DiaMeica Inc. went IPO on 12.7.18.** The stock, ticker: DMAC, started to trade at \$4.00 on NASDAQ with the initial public offering of 4,100,000 shares, implied Mkt Cap of 35mn. DMAC focuses on recombinant proteins and monoclonal antibodies.
- **Synthorx Inc. went IPO on 12.7.18.** The stock, ticker: THOR, started to trade at \$11.00 on NASDAQ with the initial public offering of 11,912,727 shares, implied Mkt Cap of \$405mn. THOR leverages its first-of-its-kind platform technology to discover and develop optimized biologics for cancer and autoimmune disorders.
- **BIIB submitted NDA to FDA for BIIB098.** On 12.17.18, Alkermes and BIIB announced submission of diroximel fumarate (BIIB098) for the treatment of relapsing forms of multiple sclerosis (MS).
- **LOXO initiated a Phase1/2 clinical trial of LOXO305.** On 12.21.18, LOXO announced initiation of LOXO305 for genomic defined BTK inhibitors including CLL, SLL and NHL cancers.
- **ALXN received early FDA approval for ULTOMIRIS.** On 12.21.18, ALXN announced FDA had approved ULTOMIRIS for treatment of PNH (paroxysmal nocturnal hemoglobinuria).
- **REGN settled with MRUS-Q on all patents litigation.** On 12.20.18, REGN agreed to invest \$15mn in MRUS-Q, representing 118% premium of MRUS-Q's share price for multi-year and multi-jurisdiction settlement.
- **JNJ announced \$5bn stock buy-back.** On 12.17.18, after lost \$50bn Mkt Cap due to the scathing news on its baby powders with asbestos, JNJ decided to initiate \$5bn share buy-back program.

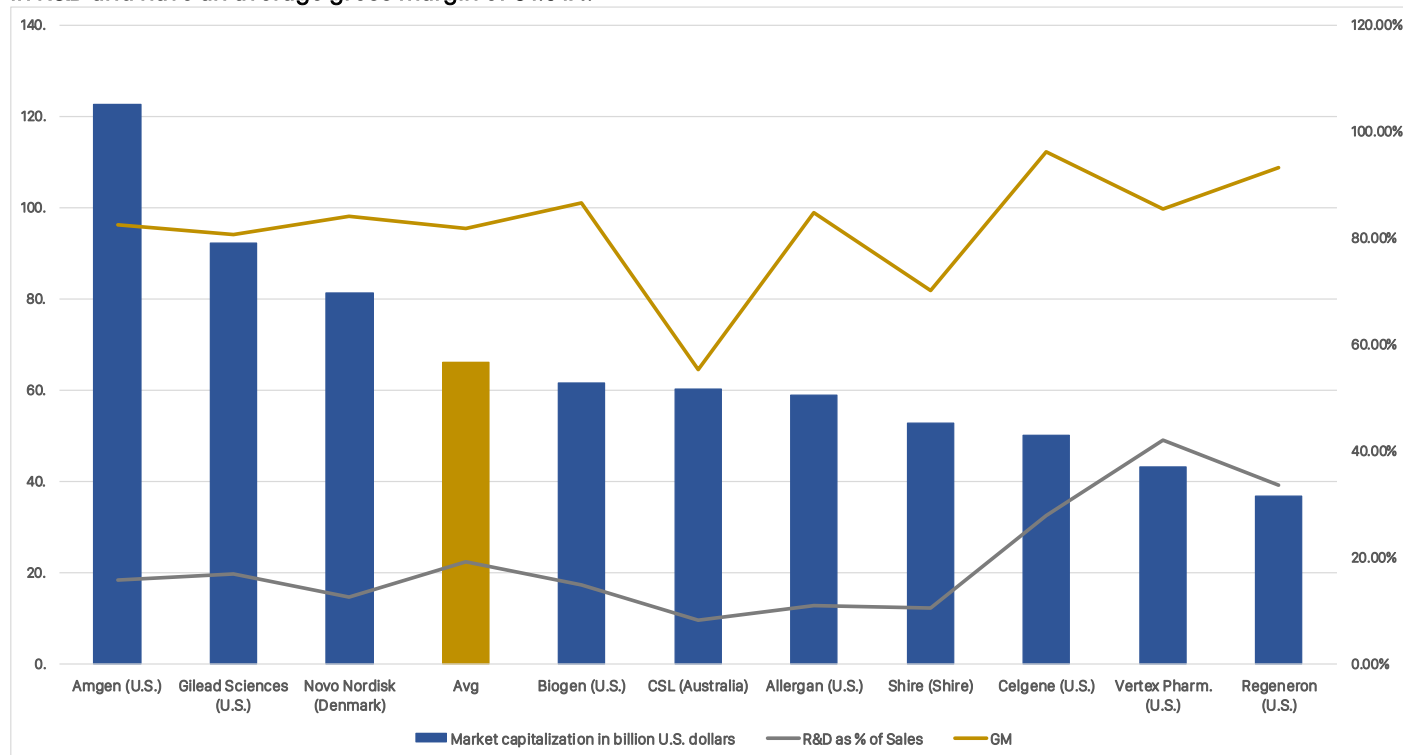
What's coming up:

Date	Ticker	Company Name	Event	Location	Note
12/31/18	GOSS	Gossamer Bio Inc	IPO	NASDAQ	Plan to raise \$264mn
1/6/19	JPM	J.P. Morgan	37th Annual Healthcare Conference	San Francisco, CA, US	450+ Private and Public Copanies
1/7/19	N/A	N/A	Biotech Showcase	San Francisco, CA, US	Investor Conference

Data Tracker:

- **Top Ten Global Biotech Companies (Exhibit 1):** the top ten global biotech companies have an average market cap of \$66bn. They averagely spend 19.28% of revenue in R&D and have an average gross margin of 81.91%.
- **Consensus Book (Exhibit 4):** DNLI released huge earnings miss on 11/8/18 while most of the companies delivered health earnings in Q3'18.
- **Short Interest:** The latest short interest data with an 12/14/18 settlement was released on 12/26/18. Short interest, when compared with the 11/30/18 settlement data is down 0.14% for DNLI and up 0.83% for NVCR.
- **Stock Performance:** Over the past month, NASDAQ Biotech index underperformed the S&P 500. MGNX was down 26.8%, and ALXN was down 20.3%.

Exhibit 1: the top ten global biotech companies have an average market cap of \$66bn. They averagely spend 19.28% of revenue in R&D and have an average gross margin of 81.91%.



Source: Statista, Grandation

Exhibit 2: Major Biotech M&A activities in 2018

Date	Acquirer	Ticker	Acquiree	Deal Size (\$ in bn)	Price/share (\$)	Description
1/7/2018	Celgene	CELG	Impact Biomedicines	\$ 1.10	N/A	\$1.1bn upfront payment and \$1.25bn contingent payments
1/22/2018	Celgene	CELG	Juno Therapeutics	\$ 9.00	\$ 87.00	Cash
1/22/2018	Sanofi	SNY	Bioverativ	\$ 11.60	\$ 105.00	Cash
1/29/2018	Sanofi	SNY	Ablynx	\$ 4.80	\$ 55.00	Cash per ADS Shares
5/18/2018	Takeda	4502.JP	Shire	\$ 62.20	\$ 30.33	Cash plus 1.678 Takeda's ADS share
6/7/2018	Bayer	BAYA. AG	Monsanto	\$ 63.00	\$ 122.00	Cash, equivalent of 36% premium of MON's 30 day avg
11/20/2018	Boston Scientific	BSX	BTG	\$ 4.24	\$ 11.20	Cash, equivalent of 36.6% premium of BTG's 30 day avg.
12/3/2018	GSK	GSK	Tesaro	\$ 5.10	\$ 75.00	Cash, equivalent of 110% premium of TSRO's 30 day avg.

Source: Company Profile, Grandation

Exhibit 3: Major catalysts during 12/15/18-1/15/19.

Date	Company	Ticker	Drug/Therapy	Area of Practice	Stage/Status	Catalyst
12/17/2018	Biogen	BIIB	BIIB098 (Diroximel Fumarate)	MS (multiple sclerosis)	NDA Submission	↑
12/21/2018	Loxo Oncology	LOXO	LOXO-305	Genomically Defined Cancer	Phase I/II Initiation	↑
12/21/2018	AbbVie Inc	ABBV	Upadacitinib	RA (rheumatoid arthritis)	NDA Submission	↑
12/21/2018	Alexion	ALXN	Ultomiris	PNH (Paroxysmal Nocturnal)	FDA Early Approval	↑
12/24/2018	Pfizer/Merck	PFE/MRK	Bavencio	Ovarian Cancer	Phase III Discontinued	↓

Source: Statista, Grandation

Exhibit 4: Consensus Book. ----DNL released huge earnings miss on 11/8/18 while most of the companies delivered health earnings in Q3'18.

Ticker	Company Name	Earnings Release	Revenue	GM	EBIT	EPS
DNLI	Denali Therapeutics	11/8/2018	-71.7%	NA	-51.9%	-50.0%
LOXO	Loxo Oncology Inc	11/8/2018	18.8%	NA	-22.6%	-1.5%
MGNX	MacroGenics Inc	11/7/2018	312.7%	NA	38.2%	38.8%
HZNP	Horizon Pharma PLC	11/7/2018	4.3%	1.2%	26.2%	31.4%
STIM	Neuronetics Inc	11/6/2018	7.1%	3.2%	30.7%	53.4%
CELG	Celgene Corp	11/2/2018	1.1%	-0.4%	1.6%	3.0%
IMGN	ImmunoGen Inc	11/2/2018	-16.3%	NA	-4.8%	0.0%
IDXX	IDEXX Laboratories Inc	11/1/2018	0.0%	0.1%	2.0%	8.3%
NVCR	Novocure Ltd	10/25/2018	-1.0%	3.0%	9.9%	11.0%
SGEN	Seattle Genetics Inc	10/25/2018	1.5%	2.3%	-3.7%	-55.6%
ALXN	Alexion Pharmaceuticals Inc	10/24/2018	0.9%	0.3%	10.7%	16.1%
REGN	Regeneron Pharmaceuticals	10/24/2018	1.4%	1.4%	10.3%	14.4%
BSX	Boston Scientific Corp	10/24/2018	-0.4%	1.1%	0.7%	3.1%
BIIB	Biogen Inc	10/23/2018	3.2%	-0.5%	5.9%	9.1%
DHR	Danaher Corp	10/18/2018	1.1%	-1.8%	2.8%	2.3%
ISRG	Intuitive Surgical Inc	10/18/2018	0.4%	0.9%	4.3%	6.3%

Source: Company Profile, Grandation

Exhibit 5: Short Interest Tracker. ----The latest short interest data with an 12/14/18 settlement was released on 12/26/18. Short interest, when compared with the 11/30/18 settlement data is down 0.14% for DNLI and up 0.83% for NVCR.

Ticker	Company	3mon avg daily volume	Short Interest	Days To Cover	Company Shares	Free Float	% of Free Float	Short interest /Float	Short interest /Float vs. Prior (% change)
MRNA.O	Moderna Inc	NA	3,782,739	1.03	324,411,226	NA	NA	NA	NA
DNLI.O	Denali Therapeutics Inc	425,234	8,360,122	26.60	94,957,092	74,890,844	78.9%	11.16%	-0.14%
BIIB.O	Biogen Inc	1,365,808	3,655,984	3.18	201,482,595	200,661,354	99.6%	1.82%	0.11%
CELG.O	Celgene Corp	6,469,953	15,707,365	2.24	699,251,840	696,885,075	99.7%	2.25%	0.17%
MGNX.O	MacroGenics Inc	347,880	2,335,411	5.25	42,259,080	38,849,434	91.9%	6.01%	0.40%
IMGN.O	ImmunoGen Inc	2,510,733	12,702,996	5.40	149,090,770	146,561,300	98.3%	8.67%	-1.03%
LOXO.O	Loxo Oncology Inc	350,292	2,299,723	6.18	30,614,536	27,334,447	89.3%	8.41%	-0.69%
NVCR.O	Novocure Ltd	841,640	3,459,997	4.76	93,013,564	72,924,324	78.4%	4.74%	0.83%
ALXN.O	Alexion Pharmaceuticals Inc	1,773,376	4,648,751	3.45	223,096,632	222,672,745	99.8%	2.09%	0.09%
REGN.O	Regeneron Pharmaceuticals Inc	761,992	2,313,435	3.20	106,323,210	77,938,517	73.3%	2.97%	0.28%
STIM.O	Neuronetics Inc	128,393	732,970	5.86	17,579,491	17,370,653	98.8%	4.22%	-0.18%
BSX	Boston Scientific Corp	7,870,364	11,698,210	1.60	1,383,800,781	1,380,511,891	99.8%	0.85%	0.08%
DHR	Danaher Corp	2,843,333	4,474,740	1.80	700,902,703	619,364,672	88.4%	0.72%	-0.28%
ISRG.O	Intuitive Surgical Inc	905,515	1,841,992	2.34	114,200,264	113,110,360	99.0%	1.63%	-0.09%
IDXX.O	IDEXX Laboratories Inc	584,523	1,284,997	2.27	86,233,649	84,816,208	98.4%	1.52%	0.03%
HZNP.O	Horizon Pharma PLC	1,819,131	6,567,026	3.13	167,625,915	166,082,633	99.1%	3.95%	-0.29%
SGEN.O	Seattle Genetics Inc	1,156,571	11,715,848	10.53	161,366,636	159,499,736	98.8%	7.35%	0.54%

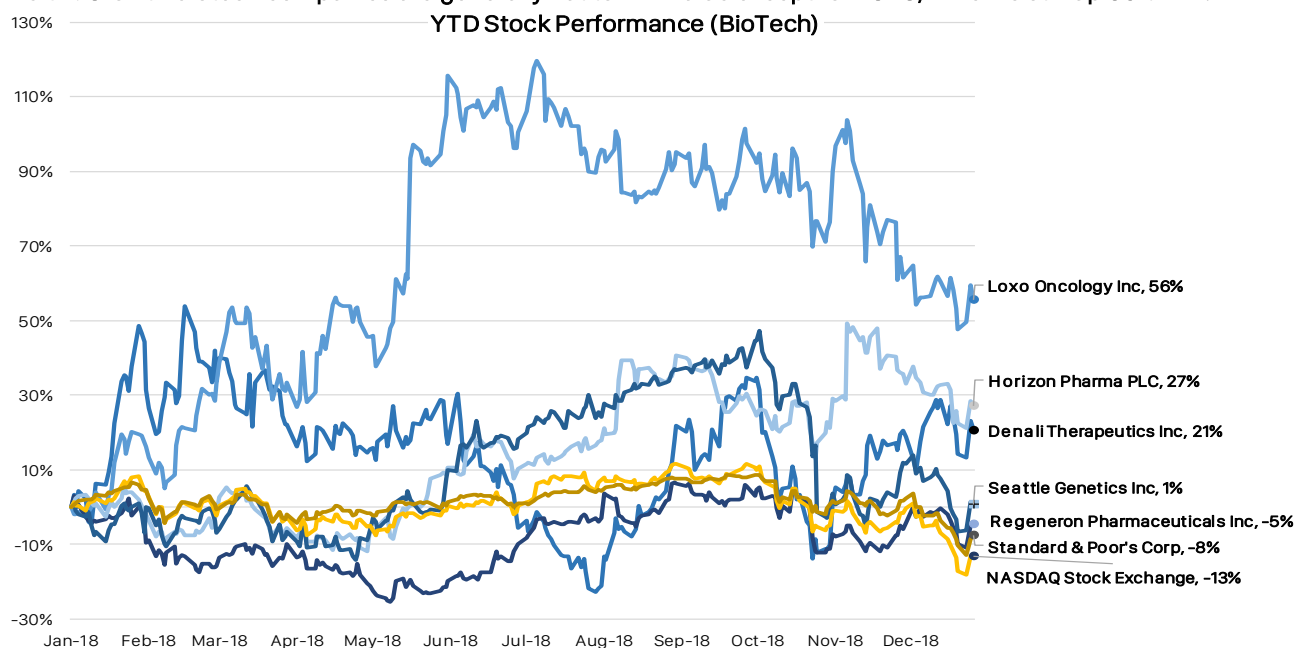
Source: Thomson Reuters, Grandation

Exhibit 6: Stock Performance. ----Over the past month, NASDAQ Biotech index underperformed the S&P 500. MGNX was down 26.8%, and ALXN was down 20.3%.

Ticker	Stock Performance	Price	Market Cap (\$ bn)	WTD Δ	MTD Δ	YTD Δ
.NBI	NASDAQ Stock Exchange	2990.22	NA	4.8%	-12.9%	-11.0%
.SPX	Standard & Poor's Corp	2467.70	NA	2.7%	-10.1%	-7.2%
Company						
STIM.O	Neuronetics Inc	18.92	0.33	-2.4%	6.1%	0.0%
DNLI.O	Denali Therapeutics Inc	19.85	1.85	5.8%	1.6%	24.6%
MRNA.O	Moderna Inc	13.52	4.75	1.2%	0.0%	0.0%
REGN.O	Regeneron Pharmaceuticals I	363.29	38.79	5.9%	-0.2%	-3.0%
LOXO.O	Loxo Oncology Inc	134.63	4.12	5.3%	-4.1%	59.9%
HZNP.O	Horizon Pharma PLC	19.30	3.20	3.7%	-4.5%	30.8%
NVCR.O	Novocure Ltd	32.75	2.96	7.1%	-7.3%	57.5%
DHR	Danaher Corp	101.5	71.14	3.0%	-7.4%	9.3%
IDXX.O	IDEXX Laboratories Inc	185.6	16.21	1.6%	-7.8%	20.2%
BSX	Boston Scientific Corp	34.48	47.71	5.0%	-8.5%	39.1%
SGEN.O	Seattle Genetics Inc	56.8	9.13	7.9%	-9.6%	5.7%
ISRG.O	Intuitive Surgical Inc	461.98	53.53	5.1%	-11.7%	28.4%
BIIB.O	Biogen Inc	295.17	59.32	4.9%	-11.8%	-7.6%
CELG.O	Celgene Corp	62.50	43.92	3.1%	-13.0%	-39.8%
IMGN.O	ImmunoGen Inc	4.50	0.66	12.9%	-19.2%	-30.6%
ALXN.O	Alexion Pharmaceuticals Inc	97.87	21.89	3.7%	-20.3%	-18.0%
MGNX.O	MacroGenics Inc	12.5	0.53	6.8%	-26.8%	-33.7%

Source: Thomson Reuters, Grandation

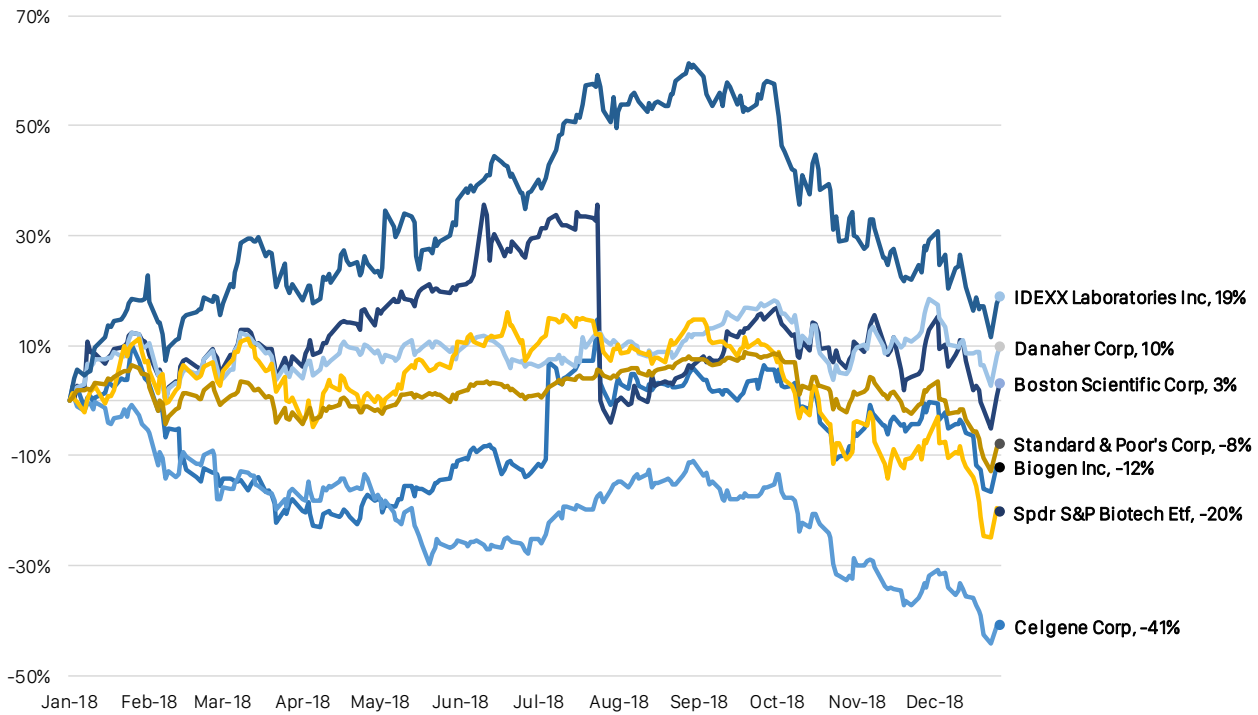
Exhibit 7: Growth biotech companies are generally flat to YTD value except for LOXO, which is still up 56% YTD.



Source: Thomson Reuters, Grandation

Exhibit 8: Pharma/Lab companies stocks returned to YTD value except for CELG, which is down 41% YTD.

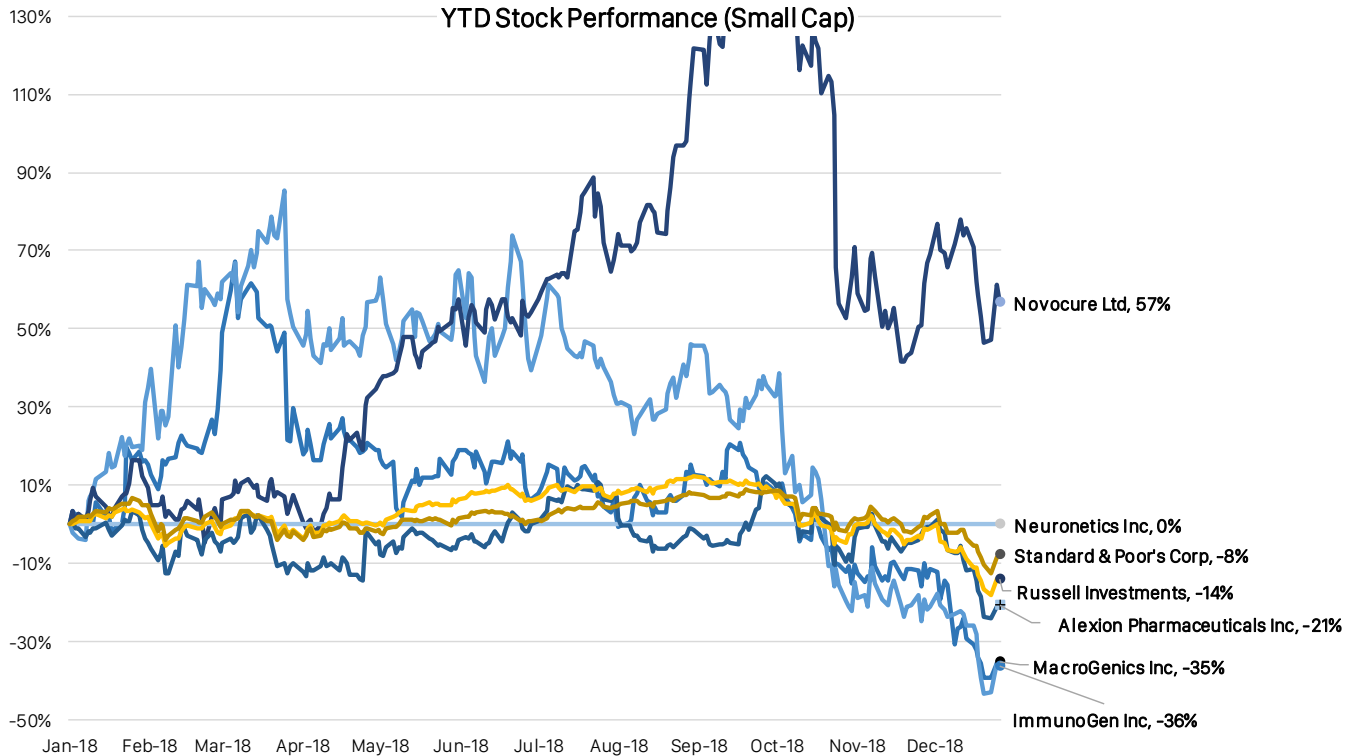
YTD Stock Performance (Pharma/Lab)



Source: Thomson Reuters, Grandation

Exhibit 9: Small Cap biotech companies are general below YTD value expect for NVCR, which is up 57% YTD.

YTD Stock Performance (Small Cap)



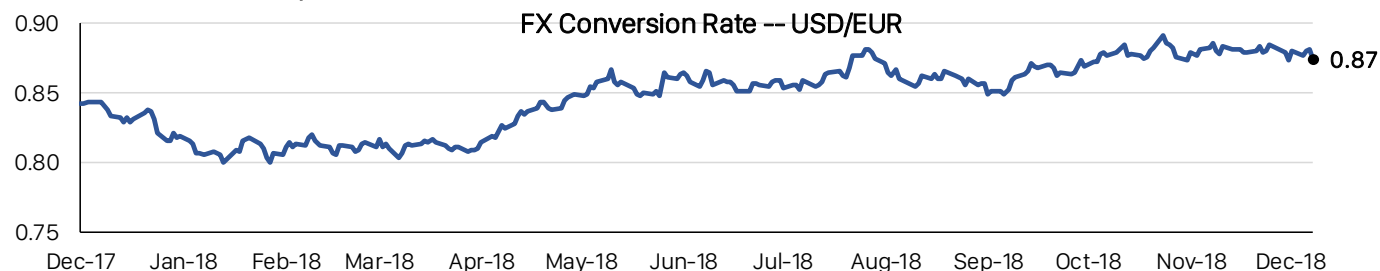
Source: Thomson Reuters, Grandation

Exhibit 10: Currency Tracker. YTD, the USD has depreciated against the CNY, CAD and JPY but appreciated against EUR and GBP.

Currency	12/27/18	12/20/18	WoW Δ	YTD Δ	YoY Δ
USD/EUR	0.875	0.874	0.1%	5.0%	3.9%
USD/JPY	110.620	111.280	-0.6%	-1.8%	-2.4%
USD/CNY	6.865	6.883	-0.3%	5.5%	4.7%
USD/GBP	0.792	0.790	0.2%	6.9%	6.0%
USD/CAD	1.363	1.351	0.9%	8.7%	7.7%
USD/INR	70.344	69.963	0.5%	10.5%	9.7%

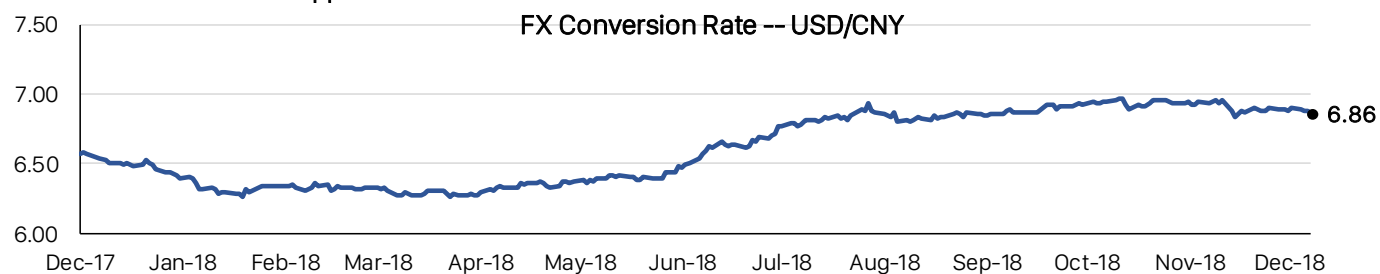
Source: Thomson Reuters, Grandation

Exhibit 11: EUR vs. USD depreciated 0.1% WoW to 0.87.



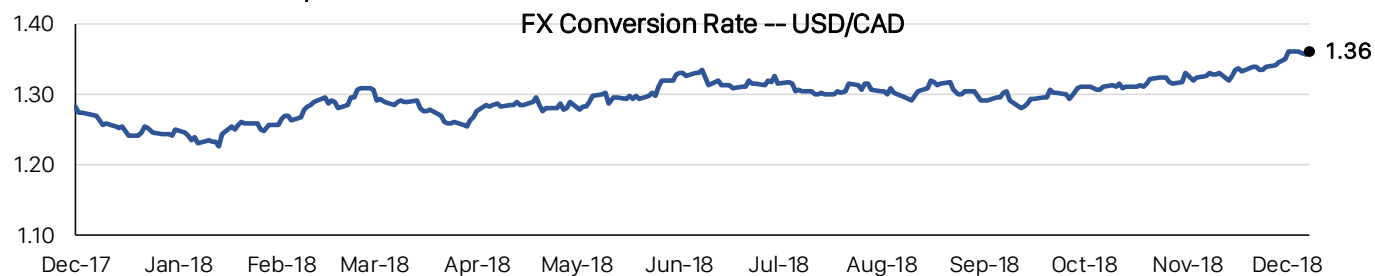
Source: Thomson Reuters, Grandation

Exhibit 12: CNY vs. USD is appreciated 0.3% WoW to 6.86.



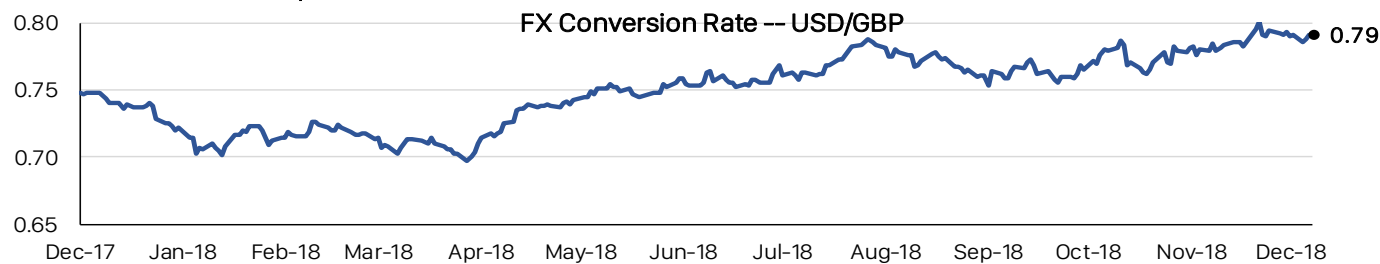
Source: Thomson Reuters, Grandation

Exhibit 13: CAD vs. USD depreciated 0.9% WoW to 1.35.



Source: Thomson Reuters, Grandation

Exhibit 14: GBP vs. USD depreciated 0.2% WoW to 0.79.



Source: Thomson Reuters, Grandation

Exhibit 15: Valuation/Comp Sheet

Ticker	Company	Market Cap (\$bn)	Price 12/26/18	YTD Δ	MTD Δ	Revenue Growth		EPS		FCF Yield	EV /Sales	EV /EBITDA	PE			PEG		Div. Yield	
						This yr /Last yr	Next yr /this yr	FY0	FY1				FY1	FY1	LTM	FY0	FY1		FY1
MRNA.O	Moderna Inc	4.39	13.52	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DNLI.O	Denali Therapeutics Inc	1.88	19.85	24.6%	1.6%	NA	461.2%	(1.34)	-1.69	NA	49.8x	NA	NA	(14.9x)	(11.8x)	NA	-57.2%	NA	NA
BIIB.O	Biogen Inc	59.47	295.17	-7.6%	-11.8%	8.3%	3.1%	25.85	28.04	8.7%	4.6x	8.0x	14.0x	11.4x	10.5x	1.5x	25.7%	NA	NA
CELG.O	Celgene Corp	43.7	62.50	-39.8%	-13.0%	17.1%	11.5%	8.79	10.41	9.3%	3.9x	6.5x	11.3x	7.1x	6.0x	0.4x	25.1%	NA	NA
MGNX.O	MacroGenics Inc	0.53	12.50	-33.7%	-26.8%	-62.8%	53.3%	(4.28)	-4.22	NA	4.9x	NA	NA	(2.9x)	(3.0x)	NA	-3.9%	NA	NA
IMGN.O	ImmunoGen Inc	0.67	4.50	-30.6%	-19.2%	-54.7%	18.7%	(1.24)	-1.29	NA	7.1x	NA	NA	(3.6x)	(3.5x)	NA	522.7%	NA	NA
LOXO.O	Loxo Oncology Inc	4.23	138.08	64.0%	-1.7%	735.2%	38.3%	(2.17)	-3.26	5.0%	20.2x	NA	NA	(63.8x)	(42.4x)	NA	-16.5%	NA	NA
NVCR.O	Novocure Ltd	3.05	32.75	57.5%	-7.3%	40.5%	34.3%	(0.64)	-0.11	NA	11.9x	NA	NA	(51.0x)	(303.2x)	NA	-25.3%	NA	NA
ALXN.O	Alexion Pharmaceuticals	21.83	97.87	-18.0%	-20.3%	14.5%	17.8%	7.61	8.70	NA	5.8x	9.7x	88.4x	12.9x	11.3x	0.7x	13.4%	NA	NA
REGN.O	Regeneron Pharmaceutic	38.63	363.29	-3.0%	-0.2%	10.7%	11.1%	21.59	22.60	NA	5.7x	12.5x	19.8x	16.8x	16.1x	1.5x	29.4%	NA	NA
STIM.O	Neuronetics Inc	0.34	19.07	NA	6.1%	NA	21.0%	(2.21)	-1.27	NA	NA	NA	NA	(8.6x)	(15.0x)	NA	NA	NA	NA
BSX	Boston Scientific Corp	46.61	33.68	39.1%	-8.5%	8.6%	8.3%	1.39	1.58	1.1%	5.4x	19.0x	31.6x	24.2x	21.4x	2.2x	15.8%	NA	NA
DHR	Danaher Corp	70.06	99.96	9.4%	-7.3%	8.2%	2.6%	4.51	4.82	5.0%	4.0x	16.8x	26.1x	22.2x	20.8x	2.7x	8.4%	0.6%	NA
ISRG.O	Intuitive Surgical Inc	52.76	461.98	28.4%	-11.7%	18.5%	16.1%	11.08	12.70	2.4%	13.4x	29.9x	47.9x	41.7x	36.4x	2.6x	21.5%	NA	NA
IDXX.O	IDEXX Laboratories Inc	16.	185.60	20.2%	-7.8%	12.2%	9.2%	4.19	4.68	2.0%	7.6x	28.9x	46.2x	44.3x	39.7x	2.5x	73.8%	NA	NA
HZNP.O	Horizon Pharma PLC	3.24	19.30	30.8%	-4.5%	12.3%	5.8%	1.70	1.80	NA	3.6x	10.0x	NA	11.3x	10.7x	0.7x	8.5%	NA	NA
SGEN.O	Seattle Genetics Inc	9.17	56.80	5.7%	-9.6%	33.5%	36.5%	(1.10)	-0.67	-6.5%	13.5x	NA	NA	(51.5x)	(85.4x)	NA	-15.5%	NA	NA

Source: Thomson Reuters, Grandation