

Fortress Biotech (NASDAQ/FBIO)

November 4, 2019

BUY: Plenty of News Flow – Avenue & Mustang

We recently spent time with CEO and founder, Dr. Lindsay Rosenwald of Fortress Bio. (at our conference last week). Fortress, in our opinion is not well understood by “the street”. We see Fortress’ ownership in multiple companies as translating into lots of catalysts with strong fundamentals. Only one of which “has to work”.

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Investment Highlights

Avenue (ATXI-Not Rated) reported results today and highlighted expectations that an NDA could be filed by year-end. Recall that Avenue Therapeutics is developing Tramadol for treating post-surgical pain. Current treatments for post-surgical pain include strong narcotics such as Schedule II (high potential for abuse) opioids, meant for those with severe pain. Much more mild treatments include IV acetaminophens and over the counter anti-inflammatory drugs (ex: ibuprofen), lacking a single product that treats more moderate pain without addictive qualities. IV Tramadol is a way to fill that gap, and approval would make it the only intravenous Schedule IV (low risk of abuse) opioid in the U.S. During two recently completed Phase 3 trials, Avenue achieved a statistically significant improvement in its primary endpoint(s), as well as all key secondary endpoints. FBIO stands to pick up a \$55M milestone through its 32% ownership of the company. Avenue spent \$2.2M in the quarter and closed the period with \$13.7M in cash.

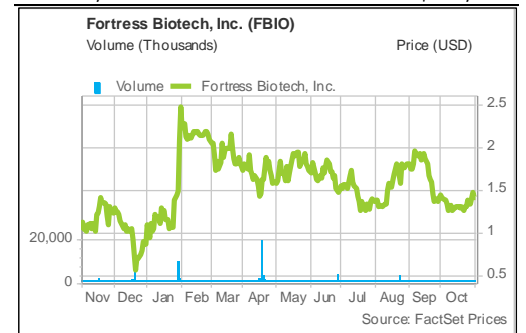
Brain Cancer too. Mustang Bio (MBIO – Not Rated) announced (Oct. 24, 2019) that the first participant has been dosed in the company’s Phase 1 clinical trial to determine the safety and efficacy of MB-108 (oncolytic virus C134), an attenuated herpes simplex virus type 1, in recurrent glioblastoma multiforme. As we have said many times, treating the first [patient] is always a significant event, as it means the clinical machine is now up and running. Our focus at Mustang is really on Orphan Bubble Boy disease. Mustang is leveraging CAR-T (and going pivotal). Mustang Bio is developing MB-107 for bubble boy disease using a first-in-class ex-vivo lentiviral gene therapy that has already shown great promise in two early-stage trials. Plans to start a pivotal trial in stem cell transplant naive patients under two years old in early 2020. FBIO owns ~ 30% of Mustang and is entitled to a 4.5% royalty in 107, as well as a 2.5% equity dividend annually. We see peak revenues for MBIO on just 107 alone in the \$50M range, suggesting fair value at 4-5x revenues of \$250M and that’s w/o the rest of MBIO’s pipeline. That equates to \$75M in value back to FBIO just for the ownership stake, and adding in the royalty and dividend and we get closer to \$100M mark.

Current Price **\$1.41**
 Price Target **\$19.00**

Estimates	F2019E	F2020E	F2021E
Expenses (\$000s)	\$ 145,507	\$ 154,616	\$ 163,222
1Q March	\$ 39,085	\$ 36,705	\$ 38,707
2Q June	\$ 34,540	\$ 38,386	\$ 40,461
3Q September	\$ 34,346	\$ 38,351	\$ 40,567
4Q December	\$ 37,536	\$ 41,175	\$ 43,487
	F2019E	F2020E	F2021E
EPS (diluted)	\$ (1.16)	\$ (1.93)	\$ (1.11)
1Q March	\$ 0.09	\$ (0.54)	\$ (0.46)
2Q June	\$ (0.24)	\$ (0.45)	\$ 0.35
3Q September	\$ (0.47)	\$ (0.46)	\$ (0.49)
4Q December	\$ (0.53)	\$ (0.48)	\$ (0.51)

EBITDA/Share	(\$1.49)	(\$0.07)	(\$1.11)
EV/EBITDA (x)	0.0	0.0	-1.1

Stock Data		
52-Week Range	\$0.49	\$2.59
Shares Outstanding (mil.)	69.0	
Market Capitalization (mil.)	\$97	
Enterprise Value (mil.)	\$22	
Debt to Capital	76%	
Book Value/Share	\$1.03	
Price/Book	26.9	
Average Three Months Trading Volume (K)	237	
Insider Ownership	25.4%	
Institutional Ownership	10.5%	
Short interest (mil.)	2.0%	
Dividend / Yield	\$0.00/0.0%	



Cancer Immunotherapy – Building a Better Mouse Trap (TKI & PD-L1). CheckPoint (CKPT) is developing an EGFR Tyrosine Kinase Inhibitor (TKI) known as CK-101 and has an anti-PD-L1 antibody (Cosibelimab). CK-101 is in early (Phase 1) development for EGFR positive lung cancer. The goal is here is to develop an improved TKI versus Tarceva, Iressa and or Tagrisso, efficacy, and adverse events profile. Recent data suggests a high tolerance of CK-101 across multiple dose groups with preliminary activity for treating the cancer. On the PD-L1 side, interim data shows substantial efficacy in multiple tumor types with a well-tolerated safety profile. So how does FBIO benefit? CKPT is 32% owned by FBIO, gets a 4.5% royalty on sales of both programs above and again, here too, receives an annual 2.5% equity dividend. Clinical progression of the TKI could go pivotal in 2020 and the PD-L1 in 2021. Since the TKI and PD-L1 space represents blockbuster opportunities if fully developed, the revenue potential is high, which means FBIO's 32% stake in CKPT as well as the royalty could prove quite valuable. For modeling purposes, if we assume just a 10% market share and a 30% probability of success, it still equates to revenues over \$300M in revenues and \$15M in royalties. Double that for the PD-L1. This suggests Checkpoint could easily be worth 3-5x revenues or \$2B in market value (must be adjusted for NPV). 32% of which is owned by FBIO or \$640M in value, and again that is without the royalty or dividend valued.

A Unique Model That Manages Risk but Keeps the Upside. We have known the senior management of Fortress for more than a decade and have the highest respect for the track record of this team to create shareholder value while finding, developing to key inflection points and finally commercializing value-creating therapeutics. The platform value of the Fortress Machine should not be underestimated. We believe its value goes beyond just the sum of the parts of the therapeutics in its pipeline (there are many) and the multiple ownership stakes in its public companies such as Avenue Therapeutics (ATXI – Not Rated) where Fortress owns ~32% of this \$100M MC company, but its real value is in the discovery, licensing, company infra-structure (access to a pool of CEO/CFO/CMO/CSO's and the right boards) as well as established vendors (CRO's, investment banks, regulatory expertise) to create the next company.

Cyprium Therapeutics (private), 89% owned by Fortress - Menkes Disease. Cyprium is developing CUTX-101 for Menkes disease, a rare genetic disorder, affecting about 1 in 100,000 newborns. The disease may cause weak muscle and bone structure, a delay in normal development, seizures, neurodegeneration, and many other painful symptoms and ultimately death. Because of the intensity of the symptoms, infants diagnosed with Menkes disease rarely live past three years of age. CUTX – 101 showed a 28% reduction in mortality (early treatment) and improvements in neurodevelopment in a Phase 1-2 trial. A Phase 3 trial is now underway with an NDA filing in 2020 possible. Given the nature of this disease, a pediatric voucher is also possible. These vouchers are typically monetized at \$50-\$200M. We also note that Fortress receives a 4.5% royalty.

Caelum Biosciences (private), 43% owned by Fortress. Alexion owns just under 20% (\$30M investment) in Caelum. The lead program is CAEL-101 (partnered with Alexion). We note that Alexion is obligated to make a \$30M payment based on certain milestones (such as 50% enrollment in the current Phase 2 trial combined with other elements, manufacturing, et al.). Alexion has the option to acquire Caelum (60 days post Phase 2 data) for \$160M (upfront) up to a total value of \$500M, (which translates into \$60M value to Fortress). CAEL-1 is an amyloid fibril targeted therapy designed to reduce/eliminate amyloid deposits in patients with AL amyloidosis, a rare disorder that results in misfolded immunoglobulin light chain protein that builds up in tissues and organs, principally the kidneys and heart. The Phase 2 trial is expected to begin next year with data 12 months from the start. Again, based on Alexion's option, we place the value of Fortress position between \$50 and \$75M and we note that acquisition is triggered if Alexion is acquired.

Journey Medical Corporation – Internal Fortress Company. \$23M in revenues from dermatology franchise in 2018. Targadox (doxycycline) is the lead product, indicated for acne. The company is cash-flow positive today and could contribute \$5-10M in cash annually depending on the growth of the core franchise. Typically, we value top-line revenues at 3-5x, and free cash flow at 6-10x, so it's fair to equate value to this franchise. With that said, we expect Journey to continue to grow through product acquisition, making significantly higher top line and bottom line revenue contributions to Fortress over-time.

That's Not All. Fortress also has several additional internal private companies such as Aevitas Therapeutics Inc. (gene therapy), Cellvation Inc. (traumatic brain injury), Helocyte Inc. (CMV) and Tamid Bio Inc. (adeno-associated virus therapeutics). As these are earlier stage platforms, we do not for conservatism include their value in our assessment.

Valuation: Valuation is a complex discussion as there are multiple ways to value a "platform therapeutics company" like Fortress that has significant ownership stakes in multiple public companies with the right to royalties and certain milestones, internal products that are generating revenues and internal private companies that have therapeutic pipeline candidates. We choose to model the key products as they exist (inside or outside the company) and project them, based on the ownership percentage, to the Fortress income statement. We separate royalties and milestones. We model internal products as well. We then assume the complete consolidated R&D, SG&A plus the Fortress current share count (dilution) to project 2030 revenues, expenses, and ultimately net income. We recognize that the income statement, balance sheet and cash flow statements need to be adjusted, (consolidated as they are, they do not paint the best picture of Fortress finances, which we believe is actually improved, when "de-consolidated") to provide the best operational picture of the company. We believe our model is conservative as we only partially count the revenues versus the consolidated expenses, based on the company's controlling interest of the outside companies.

For each product we make certain assumptions about timing and probability of success (POS) and apply these assumptions to our model. Our POS factor ranges from as low as just 30% to as high as 70% based on what we feel the data has shown, as well as the chances that the drug can be commercialized. On top of this, we then apply a risk rate of 15% in our Free Cash Flow to the Firm (FCFF), Discounted EPS (dEPS) and Sum of the Parts (SOP) models. We then average the result and round to the nearest whole number to derive our \$19.00-12-month price target.

Risk to our thesis, include the following: (1) commercial; (2) regulatory; (3) clinical; (4) manufacturing; (5) financial; (6) liability; and (7) intellectual property. We review these and other risks in the risk section of this report.

Exhibit 1. Fortress Biotech Companies and Catalysts.

Product	Company	Event	Timeline	Impact
IV Tramadol	Avenue Therapeutics	Second Pivotal Phase 3 results	//	+
	32% Owned by Fortress	Open-label safety study	//	
	Milestones too (\$55M)	File NDA/BLA	4Q19	+
	Indication: Pain	Potential US approval	4Q20	+
		Potential US launch	1Q21	
MB-107	Mustang Bio	Transfer of MB-107 IND from St. Jude to Mustang	4Q19	+
	30% Owned by Fortress	Registration trial results	2Q20	+
	4.5% Product Royalty	Begin First Pivotal trial	1Q20	
	2.5% annual equity dividend	Begin Second Pivotal trial	4Q20	
	Indication: Bubble Boy	First Pivotal trial results	2Q21	
		Second Pivotal trial results	4Q21	
		File NDA/BLA	3Q21	+
		Potential US approval	1Q22	
		Potential US launch	2Q22	+
CUTX-101	Cyprum Therapeutics	Phase 3 Data - Menkes Disease	4Q19	+
	89% Owned by Fortress	File NDA/BLA	2Q20	+
	4.5% Product Royalty	Potential US approval	2Q21	+
	2.5% annual equity dividend	Potential US launch	4Q21	
Cosibelimab	CheckPoint Therapeutics	NSCLC Data	2Q19	+
	32% Owned by Fortress	Registration-enabling expansion cohorts	1H20	+
	4.5% Product Royalty	File NDA/BLA	2Q21	
	2.5% annual equity dividend	Potential US approval	1Q22	
	PD-L1 MaB	Potential US launch	3Q22	+
CK-101	CheckPoint Therapeutics	Initiate registration trial	4Q19	
	TKI	Registration trial results	4Q21	
		File NDA/BLA	2Q22	+
		Potential US approval	1Q23	
		Potential US launch	3Q23	
		File NDA/BLA	2Q22	+
		Potential US approval	1Q23	
		Potential US launch	3Q23	
CAEL-101	Caelum Biosciences	Amyloid Fibroid Therapy partnered with Alexion	2H19	
	43% Owned by Fortress	Phase 1/2 Trial	2020	+
	20% owned Alexion for \$30M	Phase 1/2 Data & \$50M Milestone (Alexion to Caelum)	2021	
Dermatology	Journey Medical	Quarterly Revenues & Cash Flow Positive	Current	
	Internal Fortress company's	Aevitas, Cellvation, Helocyte, Tamid Bio	Current	

Stock Significance Scale: + of moderate importance; ++ higher level; +++ very important

Source: Dawson James

Model Assumptions

1. We model five late-stage therapeutic products (below) and apply to each one its own probability of success factor.
2. Each model assumes launch timing, market share, and pricing.
3. Models are based on available statistics for prevalence and incidence of the target therapeutic indication.
4. Price is based on our understanding of the market and the duration of therapy annually.

Exhibit 2. Product Models

Avenue Therapeutics	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E
IV Tramadol													
IV pain relievers market	10,000,000	10,010,000	10,020,010	10,030,030	10,040,060	10,050,100	10,060,150	10,070,210	10,080,281	10,090,361	10,100,451	10,110,552	10,120,662
Cost of Therapy				\$200	\$200	\$202	\$204	\$206	\$208	\$210	\$212	\$214	\$217
Price Change					1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Market share				1%	2%	4%	10%	20%	30%	35%	40%	45%	45%
Patients Treated with a Course				100,300	200,801	402,004	1,006,015	2,014,042	3,024,084	3,531,626	4,040,180	4,549,748	4,554,298
Revenues (000)	20,060	40,160		81,205	205,247	415,014	829,375	1,658,750	2,487,150	2,923,555	3,359,960	3,796,365	3,800,000
Probability of Success (Phase 3)				70%	70%	70%	70%	70%	70%	70%	70%	70%	70%
Adjusted Revenues (000)				\$ 14,042	\$ 28,112	\$ 56,843	\$ 143,673	\$ 290,510	\$ 440,562	\$ 519,648	\$ 600,423	\$ 682,912	\$ 690,431

Mustang Bio	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E
MB-107 "Bubbe Boy"													
Current "Reservoir" patients (U.S. and ex-U.S. markets)					1,050	1,125	900	600	500	575	475	375	275
New Cases a year (U.S. and ex-U.S. markets)					75	75	75	75	75	75	75	75	75
Market Share Prevalance					10%	20%	35%	55%	60%	65%	70%	75%	80%
Market Share New Cases					10%	20%	35%	55%	75%	85%	90%	90%	90%
Total patients treated					113	240	341	371	356	438	400	349	288
Cost of Therapy (one-time)					\$ 1,500,000	\$ 1,500,000	\$ 1,500,000	\$ 1,500,000	\$ 1,500,000	\$ 1,500,000	\$ 1,500,000	\$ 1,500,000	\$ 1,500,000
Revenues (M)					168,750	360,000	511,875	556,875	534,375	656,250	600,000	523,125	431,250
Probability of Success (Phase 2/3)					30%	30%	30%	30%	30%	30%	30%	30%	30%
Adjusted Revenues (M)					\$ 50,625	\$ 108,000	\$ 153,563	\$ 167,063	\$ 160,313	\$ 196,875	\$ 180,000	\$ 156,938	\$ 129,375
Royalty assumed					4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%
Royalty revenue (000)					\$ 2,278	\$ 4,860	\$ 6,910	\$ 7,518	\$ 7,214	\$ 8,859	\$ 8,100	\$ 7,062	\$ 5,822

CheckPoint PD-L1 in NSCLC	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E
Cosibelimab (NSCLC)													
New cases of lung cancer/year		228,150	228,150	228,150	228,150	228,150	228,150	228,150	228,150	228,150	228,150	228,150	228,150
Patients - PDL1 Option		75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%
Target patient population		171,113	171,113	171,113	171,113	171,113	171,113	171,113	171,113	171,113	171,113	171,113	171,113
Market share					1%	2%	4%	6%	8%	10%	12%	14%	14%
Patients treated					1,711	3,422	6,845	10,267	13,689	17,111	20,534	23,956	23,956
Costs					\$ 35,000	\$ 55,000	\$ 55,000	\$ 55,000	\$ 55,000	\$ 55,000	\$ 55,000	\$ 55,000	\$ 55,000
Revenues (000)					\$ 59,889	\$ 188,224	\$ 376,448	\$ 564,671	\$ 752,895	\$ 941,119	\$ 1,129,343	\$ 1,317,566	\$ 1,317,566
Probability of Success					50%	50%	50%	50%	50%	50%	50%	50%	50%
Adjusted Revenues (M)					\$ 29,945	\$ 94,112	\$ 188,224	\$ 282,336	\$ 376,448	\$ 470,559	\$ 564,671	\$ 658,783	\$ 658,783
Royalty assumed		4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%
Royalty revenue (000)					\$ -	\$ -	\$ 1,348	\$ 4,235	\$ 8,470	\$ 12,705	\$ 16,940	\$ 21,175	\$ 21,175

CheckPoint TKI in NSCLC	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E
CK-101 (EGFR mutation + LC)													
New cases of lung cancer/year		228,150	228,150	228,150	228,150	228,150	228,150	228,150	228,150	228,150	228,150	228,150	228,150
Total Lung Cancer Market size (M)		19,250,000	19,478,150	19,706,300	19,934,450	20,162,600	20,390,750	20,618,900	20,847,050	21,075,200	21,303,350	21,531,500	21,759,650
Total NSCLC lung cancer		16,362,500	16,556,428	16,750,355	16,944,283	17,138,210	17,332,138	17,526,065	17,719,993	17,913,920	18,107,848	18,301,775	18,495,703
% of patients with EGFR/NSCLC patients		26%	26%	26%	26%	26%	26%	26%	26%	26%	26%	26%	26%
Patients with EGFR/NSCLC patients					59,319	59,319	59,319	59,319	59,319	59,319	59,319	59,319	59,319
Market share					5%	10%	12%	14%	15%	16%	17%	18%	18%
Treated patients (000)					2,966	5,932	7,118	8,305	8,998	9,491	10,084	10,677	10,677
Cost (competition=\$15,240/month)					\$ 182,880	\$ 182,880	\$ 182,880	\$ 182,880	\$ 182,880	\$ 182,880	\$ 182,880	\$ 182,880	\$ 182,880
Revenues (000)					\$ 542,413	\$ 1,084,826	\$ 1,301,791	\$ 1,518,756	\$ 1,627,239	\$ 1,735,721	\$ 1,844,204	\$ 1,952,687	\$ 1,952,687
Probability of Success					30%	30%	30%	30%	30%	30%	30%	30%	30%
Adjusted Revenues (000)					\$ 162,724	\$ 325,448	\$ 390,537	\$ 455,627	\$ 488,172	\$ 520,716	\$ 553,261	\$ 585,806	\$ 585,806
Royalty assumed					4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%
Royalty revenue (000)					\$ 7,323	\$ 14,646	\$ 17,574	\$ 20,503	\$ 21,968	\$ 23,432	\$ 24,897	\$ 26,361	\$ 26,361

Cyprum Therapeutics (private)	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E
CUTX-101 (Menkes Disease)													
Prevalance (USA)	2,720	2,720	2,720	2,720	2,720	2,720	2,720	2,720	2,720	2,720	2,720	2,720	2,720
Incidence annually (USA)	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
Target patient population	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
Market share		0%	0%	0%	10%	30%	50%	70%	80%	80%	80%	80%	80%
Patients treated					250	750	1,250	1,750	2,000	2,000	2,000	2,000	2,000
Price					\$ 300,000	\$ 300,000	\$ 300,000	\$ 300,000	\$ 300,000	\$ 300,000	\$ 300,000	\$ 300,000	\$ 300,000
Revenues (000)					75,000	225,000	375,000	525,000	600,000	600,000	600,000	600,000	600,000
Probability of Success					30%	30%	30%	30%	30%	30%	30%	30%	30%
Adjusted Revenues (M)					\$ 22,500	\$ 67,500	\$ 112,500	\$ 157,500	\$ 180,000	\$ 180,000	\$ 180,000	\$ 180,000	\$ 180,000
Royalty assumed					4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%	4.5%
Royalty revenue (000)					\$ -	\$ 1,013	\$ 3,038	\$ 5,063	\$ 7,088	\$ 8,100	\$ 8,100	\$ 8,100	\$ 8,100

Source: Dawson James

Valuation: As we previously mentioned, Valuation is a complex discussion for Fortress. Fortress as the controlling entity reports consolidated statements. There are multiple ways to value a "platform therapeutics company" like Fortress that has majority ownership in multiple public companies with the rights to royalties and milestones, plus the company has its own internal products that are generating revenues and internal private companies that have their own therapeutic pipeline candidates. We choose to model the key products as they exist (inside and outside the company) and project them based on the ownership percentage to the Fortress income statement. We recognize that this is "a model." It is a method to forecast a future value. i.e., reporting the revenues of outside companies based on the percentage ownership, (not as a 100% consolidated entity) but we do show the consolidated expenses as they are currently reported by Fortress. We view our method as doubly conservative, that is, we cut the revenues but not the expenses. One might argue we need to assess each outside company, determine net-income, and apply valuation metrics, based on the projected value of the external company. We leave that for "others" to do, as our purpose is to determine, is their upside to Fortress based on the value of the holding in the external companies, the product royalties, the annual stock dividend, and the internal companies and P&L metrics of Fortress itself? We clearly conclude, Yes. In our model, we do separate and show our projected revenues, royalties and milestones. We model external and internal products. We then assume R&D, SG&A based on the current consolidated numbers. We project the share count as well as revenues, expenses, and ultimately net-income out to 2030. For each individual product, we make certain assumptions about timing and probability of success and apply these assumptions to our model. We apply a probability of success in our therapeutic models. This ranges from as low as just 30% to as high as 70% based on what we feel is the therapeutic risk that the product will advance. In addition to the success factor, we apply a 15% discount rate (r) in our Free Cash Flow to the Firm (FCFF), Discounted EPS (dEPS) and Sum of the Parts (SOP) models. We then average the result and round to the nearest whole number to derive our \$19.00 - 12 month price target.

Exhibit 3. Free Cash Flow Model

Average	19
Price Target	21
Year	2020

DCF Valuation Using FCF (mln):

units ('000)	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E
EBIT	(94,843)	(122,173)	(74,545)	(93,497)	42,813	204,593	349,827	489,468	573,567	639,929	704,893	741,081
Tax Rate	0%	0%	0%	0%	0%	10%	15%	18%	20%	21%	21%	21%
EBIT (1-t)	(94,843)	(122,173)	(74,545)	(93,497)	42,813	184,134	297,353	401,364	458,854	505,544	556,865	585,454
CapEx												
Depreciation												
Change in NWC												
FCF	(94,843)	(122,173)	(74,545)	(93,497)	42,813	184,134	297,353	401,364	458,854	505,544	556,865	585,454
PV of FCF	(109,069)	(122,173)	(64,822)	(70,697)	28,150	105,279	147,837	173,521	172,500	165,263	158,296	144,715
Discount Rate	15%											
Long Term Growth Rate	1%											
Terminal Cash Flow	4,223,632											
Terminal Value YE2030	1,044,017											
NPV	1,881,887											
NPV-Debt	9,396											
Shares out ('000)	89,807	2030E										
NPV Per Share	21											

Source: Dawson James

Exhibit 4. Discounted-EPS Model

Current Year	2020
Year of EPS	2030
Earnings Multiple	10
Discount Factor	15%
Selected Year EPS	\$ 6.19
NPV	15

		Discount Rate and Earnings Multiple Varies, Year is Constant					
		5%	10%	15%	20%	25%	30%
Earnings Multiple	1	3.80	2.39	1.53	1.00	0.66	0.45
	5	19.00	11.93	7.65	5.00	3.32	2.24
	10	37.99	23.86	15.30	9.99	6.64	4.49
	15	56.99	35.79	22.95	14.99	9.97	6.73
	20	75.99	47.72	30.59	19.99	13.29	8.98
	25	94.98	59.65	38.24	24.99	16.61	11.22
	30	113.98	71.58	45.89	29.98	19.93	13.47
	35	132.97	83.51	53.54	34.98	23.26	15.71

Source: Dawson James

Exhibit 5. Sum-of-the-Parts Model

Fortress Biotech	LT Gr	Discount Rate	Yrs to Peak	% Success	Peak Sales (MM's)	Term Val
Avenue Tramadol IV (Pain)	1%	15%	4	70%	\$986	\$7,045
NPV						\$9.5
Mustang MB-107 (bubble Boy)	1%	15%	3	70%	\$431	\$3,080
NPV						\$4.8
Cyprium CUTX-101 (Menke's Disease)	1%	30%	4	70%	\$600	\$2,069
NPV						\$2
CheckPoint Cosibelimab (PD-L1)	1%	30%	4	70%	\$1,318	\$4,543
NPV						\$4
CheckPoint CK-101 (TRK)	1%	30%	4	70%	\$1,953	\$6,733
NPV						\$5.6
Net Margin (Products)						30%
MM Shrs OS (2030E)						89
Product Total NPV						\$20
Product Royalties NPV	1%	15%	4	70%	\$132	\$944
NPV						\$1.3
NPV - Royalties & Products						\$21.1
Milestones	1%	15%	4	70%	\$50	\$357
NPV						\$0.5
NPV - Royalties & Products & Milestones						\$21.6

Source: Dawson James

Exhibit 6. Income Statement

	1Q19A	2Q19A	3Q19E	4Q19E	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E
Probability Revenue Forecast: ('000)																
Avenue Therapeutics: IV Tramadol end use sales							\$ 14,042	\$ 28,112	\$ 56,843	\$ 143,673	\$ 290,510	\$ 440,562	\$ 519,648	\$ 600,423	\$ 682,912	\$ 690,431
Percent Owned by Fortress	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%
Revenues Attributed back to Fortress	-	-	-	-	-	-	4,493	8,996	18,190	45,975	92,963	140,980	166,288	192,135	218,532	220,938
Mustang Bio - Bubble Boy (MB-107)							\$ 50,625	\$ 108,000	\$ 153,563	\$ 167,063	\$ 167,063	\$ 160,313	\$ 196,875	\$ 180,000	\$ 156,938	\$ 129,375
Percent Owned by Fortress	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%
Revenues Attributed back to Fortress	0	0	0	0	0	0	15,188	32,400	46,069	50,119	50,119	48,094	59,063	54,000	47,081	38,813
Cyprium - CUTX-101 - Menkes Disease							\$ -	\$ 22,500	\$ 67,500	\$ 112,500	\$ 157,500	\$ 180,000	\$ 180,000	\$ 180,000	\$ 180,000	\$ 180,000
Percent Owned by Fortress	89%	89%	89%	89%	89%	89%	89%	89%	89%	89%	89%	89%	89%	89%	89%	89%
Revenues Attributed back to Fortress	0	0	0	0	1	1	20,025	60,075	100,125	140,175	180,225	160,200	160,200	160,200	160,200	160,200
CheckPoint (Cosibelimab PD-L1)							\$ -	\$ 29,945	\$ 94,112	\$ 188,224	\$ 282,336	\$ 376,448	\$ 470,559	\$ 564,671	\$ 658,783	\$ 658,783
Percent Owned by Fortress	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%
Revenues Attributed back to Fortress	-	-	-	-	-	-	-	9,582	30,116	60,232	90,347	120,463	150,579	180,695	210,811	210,811
CK-101 end use sales								\$ 162,724	\$ 325,448	\$ 390,537	\$ 455,627	\$ 488,172	\$ 520,716	\$ 553,261	\$ 585,806	\$ 585,806
Percent Owned by Fortress	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%
Revenues Attributed back to Fortress	-	-	-	-	-	-	-	52,072	104,143	124,972	145,801	156,215	166,629	177,044	187,458	187,458
Journey Medical Corporation (Dermatology)	6,477	6,477	6,452	8,645	28,051	33,661	30,295	33,325	36,657	40,323	44,355	48,791	53,670	59,037	64,941	71,435
Percent Owned by Fortress	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Revenues Attributed back to Fortress	6,477	8,199	8,000	8,000	30,676	33,661	30,295	33,325	36,657	40,323	44,355	48,791	53,670	59,037	64,941	71,435
Other Revenue Back to Fortress		1,051	1,000	1,000	3,051	3,356	3,692	4,061	4,467	4,914	5,405	5,946	6,540	7,194	7,914	8,705
Fortress Revenues (consolidated)	6,477	9,250	9,000	9,000	33,728	37,019	38,482	81,594	213,443	371,665	518,221	640,158	722,438	789,775	856,406	898,359
Avenue Therapeutic (IV Tramadol) Royalties (4.5% on sales > \$325M)												\$ 19,825	\$ 23,384	\$ 27,019	\$ 30,731	\$ 31,069
Associate Milestones							\$ 55,000									
Mustang Bio - Bubble Boy (MB-107) Prob. Adj. Royalties - 4.5%								\$ 2,278	\$ 4,860	\$ 6,910.31	\$ 7,518	\$ 7,214	\$ 8,859	\$ 8,100	\$ 7,062	\$ 5,822
Associate Milestones																
Cyprium - CUTX-101 Menke's Disease - Prob. Adj. Royalties - 4.5%								\$ 1,013	\$ 3,038	\$ 5,063	\$ 7,088	\$ 8,100	\$ 8,100	\$ 8,100	\$ 8,100	\$ 8,100
Associate Milestones																
CheckPoint (Cosibelimab PD-L1) - Prob. Adj. Royalties - 4.5%								\$ -	\$ -	\$ -	\$ 1,348	\$ 4,235	\$ 8,470	\$ 12,705	\$ 16,940	\$ 21,175
Associate Milestones																
CheckPoint (CK-101 - TKI) - Prob. Adj. Royalties - 4.5%								\$ 7,323	\$ 14,645	\$ 17,574	\$ 20,503	\$ 21,968	\$ 23,432	\$ 24,897	\$ 26,361	\$ 26,361
Associate Milestones																
Total Royalties & Milestones	-	-	-	-	-	-	55,000	3,291	15,220	26,618	33,527	59,878	70,781	79,356	87,730	92,528
Expenses:																
Fortress																
Costs of Goods Sold (Journey Medical)	1,884	2,386	1,479	682	6,431	6,732	6,059	6,665	7,331	8,065	8,871	9,758	10,734	11,807	12,988	14,287
%COGS	29%	26%	23%	8%	23%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
Research and Development	23,273	18,511	19,000	18,000	78,784	82,723	86,859	91,202	95,762	100,551	105,578	110,857	116,400	122,220	128,331	134,747
Research and Development- licenses acquired	450	200	978	2,624	4,253	8,000	12,000	16,000	16,800	17,640	18,522	19,448	20,421	21,442	22,514	23,639
General and Administrative	13,478	13,443	12,889	16,229	56,040	57,160	58,304	59,470	60,659	61,872	63,110	64,372	65,659	66,972	68,312	69,678
Total Operating expenses (consolidated)	39,085	34,540	34,346	37,536	145,507	154,616	163,222	173,337	180,553	188,127	196,081	204,435	213,214	222,441	232,144	242,352
Operating income (Loss)	(29,835)	(25,290)	(25,346)	(28,536)	(109,006)	(117,597)	(69,740)	(88,452)	48,110	210,156	355,667	495,601	580,006	646,690	711,991	748,535
Interest income (expense), net	438	779			1,217	1,278	1,342	1,409	1,479	1,553	1,631	1,712	1,798	1,888	1,982	2,081
Interest expense and financing fee	(2,469)	(3,106)			(5,575)	(5,854)	(6,146)	(6,454)	(6,776)	(7,115)	(7,471)	(7,845)	(8,237)	(8,649)	(9,081)	(9,535)
Change in FV of derivative liability																
Change in FV of subsidiary convertible note																
Change in FV of investments																
Gain on deconsolidation of Caelum	18,384	137			18,521	(4,576)	(4,805)	(5,045)	(5,297)	(5,562)	(5,840)	(6,132)	(6,439)	(6,761)	(7,099)	(7,454)
Total Other Income	16,353	(2,190)			14,163	(4,576)	(4,805)	(5,045)	(5,297)	(5,562)	(5,840)	(6,132)	(6,439)	(6,761)	(7,099)	(7,454)
Pretax Income (loss from continuing operations)	(13,482)	(27,480)	(25,346)	(28,536)	(94,843)	(122,173)	(74,545)	(93,497)	42,813	204,593	349,827	489,468	573,567	639,929	704,893	741,081
Income Tax Benefit (Provision)										20,459	52,474	88,104	114,713	134,385	162,125	185,270
Tax Rate	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	15%	18%	20%	21%	23%	25%
GAAP Net Income (Loss)	(13,482)	(27,480)	(25,346)	(28,536)	(94,843)	(122,173)	(74,545)	(93,497)	42,813	184,134	297,353	401,364	458,854	505,544	542,767	555,811
Less: net loss attributable to non-controlling interests	17,647	14,382			32,029	-	-	-	-	-	-	-	-	-	-	-
Net Income (loss) attributable to common stockholders	4,165	(13,098)	(25,346)	(28,536)	(62,814)	(122,173)	(74,545)	(93,497)	42,813	184,134	297,353	401,364	458,854	505,544	542,767	555,811
GAAP-EPS	0.09	(0.24)	(0.47)	(0.53)	(1.16)	(1.91)	(1.00)	(1.25)	0.57	2.45	3.94	5.30	6.03	6.62	7.08	7.22
GAAP-EPS (Dil)	0.07	(0.20)	(0.38)	(0.43)	(0.95)	(1.60)	(0.86)	(1.07)	0.49	2.10	3.38	4.54	5.17	5.67	6.07	6.19
Wgtd Avg Shrs (Bas) - '000s	48,507	53,726	53,780	53,834	52,462	63,983	74,255	74,552	74,851	75,151	75,452	75,754	76,057	76,362	76,668	76,975
Wgtd Avg Shrs (Dil) - '000s	63,811	66,000	66,066	66,132	65,502	76,313	86,633	86,980	87,329	87,679	88,030	88,383	88,737	89,092	89,449	89,807

Source: Dawson James

Risk Analysis

In addition to the typical risks associated with development stage specialty pharmaceutical companies, potential risks specific to Fortress Biotech are as follows:

Financial risk. The company may need to raise capital in the marketplace in order to successfully push their products into the next phase, and there can be no assurances that the company will be able to successfully raise capital and or do so, on favorable terms.

Clinical and regulatory risk. Lead products must start and complete clinical trials. Trials may not produce results sufficient for regulatory approval.

Partnership risk. Fortress Biotech may seek partnerships for clinical development support and commercialization. We have no specific knowledge of any discussions with possible partners today, and there can be no assurances that the company will be able to secure a favorable partnership.

Commercial risk. There are no assurances that the company will be able to secure favorable pricing, commercially launch products, and achieve significant market share to become profitable.

Legal and intellectual property risk. The company may have to defend its patents and technical know-how, and there can be no assurances that the patents will not be infringed or will be held as valid if challenged, and or that the company may infringe on third party's patents.

Companies mentioned in this report:

Alexion (ALXN/NASDAQ)-Not covered.

InvaGen Pharmaceuticals – (Private).

St. Jude Children’s Research Hospital (Private).

Mustang Bio (MBIO/NASDAQ) – Not covered.

Checkpoint Therapeutics (CKPT/NASDAQ) – Not covered.

Avenue Therapeutics (ATXI/ NASDAQ) – Not covered.

Caelum Biosciences (Private).

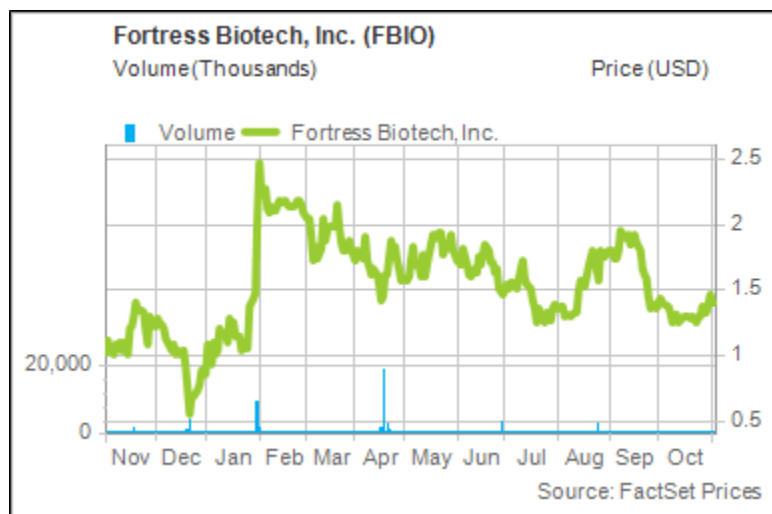
Journey Medical Corporation (internal Fortress company).

Cyprium Therapeutics (Private).

Important Disclosures:

Price Chart:

Price target and rating changes over the past three years:



Initiated – Buy August 26, 2019 Price Target \$19.00

Update – Buy September 17, 2019 Price Target \$19.00

Update – Buy November 4, 2019 Price Target \$19.00

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- 3) **Sell:** the analyst believes the price of the stock will decline by at least 20% over the next 12-18 months and should be sold.

The following chart reflects the range of current research report ratings for all companies followed by the analysts of the Firm. The chart also reflects the research report ratings relating to those companies for which the Firm has performed investment banking services.

Ratings Distribution	Company Coverage		Investment Banking	
	# of Companies	% of Total	# of Companies	% of Totals
Market Outperform (Buy)	28	82%	4	14%
Market Perform (Neutral)	6	18%	0	0%
Market Underperform (Sell)	0	0%	0	0%
Total	34	100%	4	12%

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