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## Lineage Cell Therapeutics (NYSE/LCTX)

June 25, 2021

### BUY: OPC1 for Spinal Cord Injury (SCI)

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*Lineage provided an update on the clinical advancement of OPC1, its allogeneic oligodendrocyte progenitor cell (OPC) transplant therapy for the treatment of spinal cord injury (SCI).*

### Investment Highlights

**OPC1 Update:** Following feedback received from an interaction held with the FDA last week under the FDA's Regenerative Medicine Advanced Therapy (RMAT) program, Lineage intends to submit an amendment to its Investigational New Drug application (IND) for OPC1 to support a Phase 1 clinical study to evaluate the safety and performance of Neurgain Technologies Inc.'s Parenchymal Spinal Delivery System to deliver OPC1 cells to the spinal cord.

- In February, the company entered into an exclusive option and license agreement with Neurgain to evaluate its novel PSD system in both preclinical and clinical settings.
- The IND amendment is expected to be submitted to the FDA in Q4 of 2021.
- The data from the Phase 1 clinical study is intended to validate the Neurgain PSD system for use in a late-stage clinical study, expected to begin in 2022 following the completion of the Phase 1 study.
- Lineage plans to evaluate the safety and performance of the Neurgain PSD system to deliver OPC1 to the spinal cord in both the preclinical and clinical setting.
- If results of these studies are positive, Lineage may exercise its option to enter into a pre-negotiated license and commercialization agreement with Neurgain.
- Pursuant to that agreement, Lineage may integrate the Neurgain PSD system into a late-stage clinical trial and, if approved, commercial use of OPC1 for the treatment of patients with spinal cord injury. There currently are no FDA approved treatments for spinal cord injury.

**Valuation:** Our valuation for Lineage is principally driven by the opportunity in Dry AMD, narrowed down further by a sub-set of patients with GA. Our model does include modest revenues from the SCI product and from Renevia, but as previously stated, the majority of the valuation is driven by OpRegen. We assume just a 30% probability of success in Dry AMD and SCI, which drives our \$6.00 target.

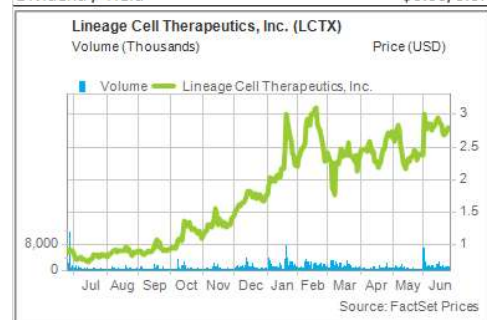
**Risks to our thesis include:** (1) clinical trial; (2) commercial; (3) employee; (4) financial; (5) intellectual property; (6) partnership; and (7) regulatory.



OPC1 Transplant Procedure

Source: Lineage

Stock Data			
Current Price			\$2.78
Price Target			\$6.00
52-Week Range	\$0.73	-	\$3.13
Shares Outstanding (mil.)			162.1
Market Capitalization (mil.)			\$451
Enterprise Value (mil.)			\$431
Debt to Capital			0%
Book Value/Share			\$1.28
Price/Book			2.8
Average Three Months Trading Volume (K)			1,052
Insider Ownership			0.5%
Institutional Ownership			42.9%
Short interest (mil.)			0.0
Dividend / Yield			\$0.00/0.0%

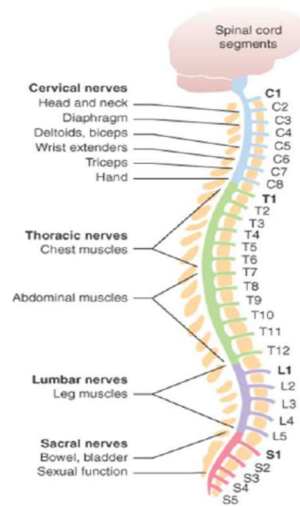


**Spinal Cord Injury. Diseases and disorders of the spinal cord:** AST-OPC1 is Asteria's product in development for spinal cord injuries. It utilizes oligodendrocyte progenitor cells, which the company manufactures from its pluripotent stem cell platform. Asterias is enrolling patients in a Phase 1/2a clinical trial in subacute, cervical (neck) spinal cord injury. AST-OPC1 cells are inserted directly into the damaged section of the spinal cord through a surgical procedure. The hope is that addition of these cells can exert a trophic effect (supporting healthy functioning of nerve cells) and as such, can improve the transmission of signals from the brain through the spinal cord and out to the upper extremities. In an ideal world, the patient could be able to regain some feeling and/or function in the use of their arms, hands and fingers. Regaining use of the upper extremities can dramatically reduce health care costs and have a direct impact on a patient's ability to live independently. OPC1 has RMAT (Regenerative Medicine Advanced Therapy) designation from the FDA and has received greater than \$14M in funding from the California Institute of Regenerative Medicine (CIRM).

#### Exhibit 1. SCI Treatment Goals

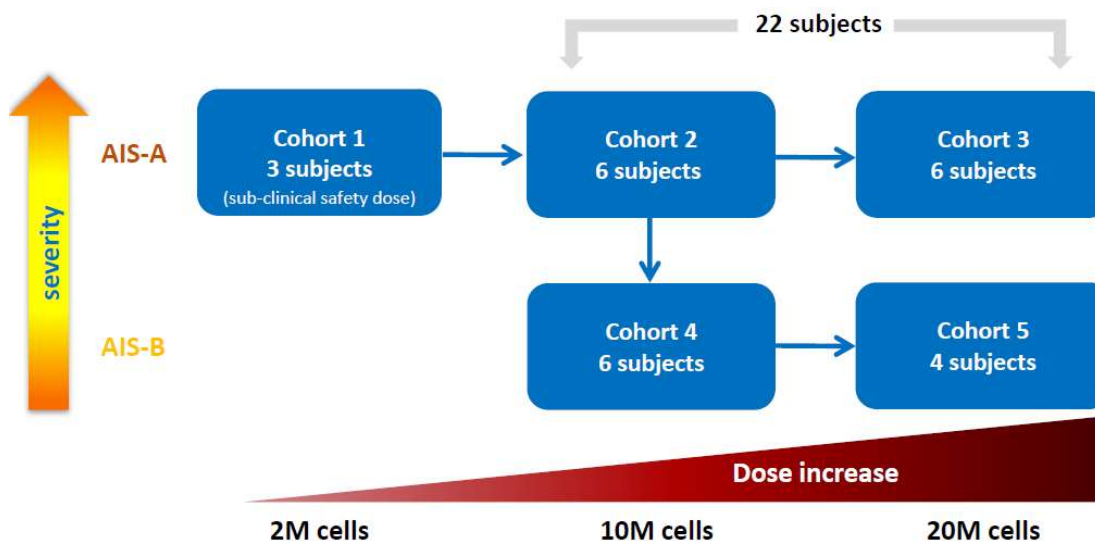


Source: Lineage



- Higher-level injuries result in more extensive impairments
- Gains in motor function, particularly in the upper extremities, can provide significant benefits in self-care and lower costs of care
- The goal of Lineage's cell therapy is to provide additional arm, hand, and finger function, increasing independence and quality of life

#### Exhibit 2. SCiStar Clinical Trial Study Design



Source: Lineage

Exhibit 3. Patient Stories

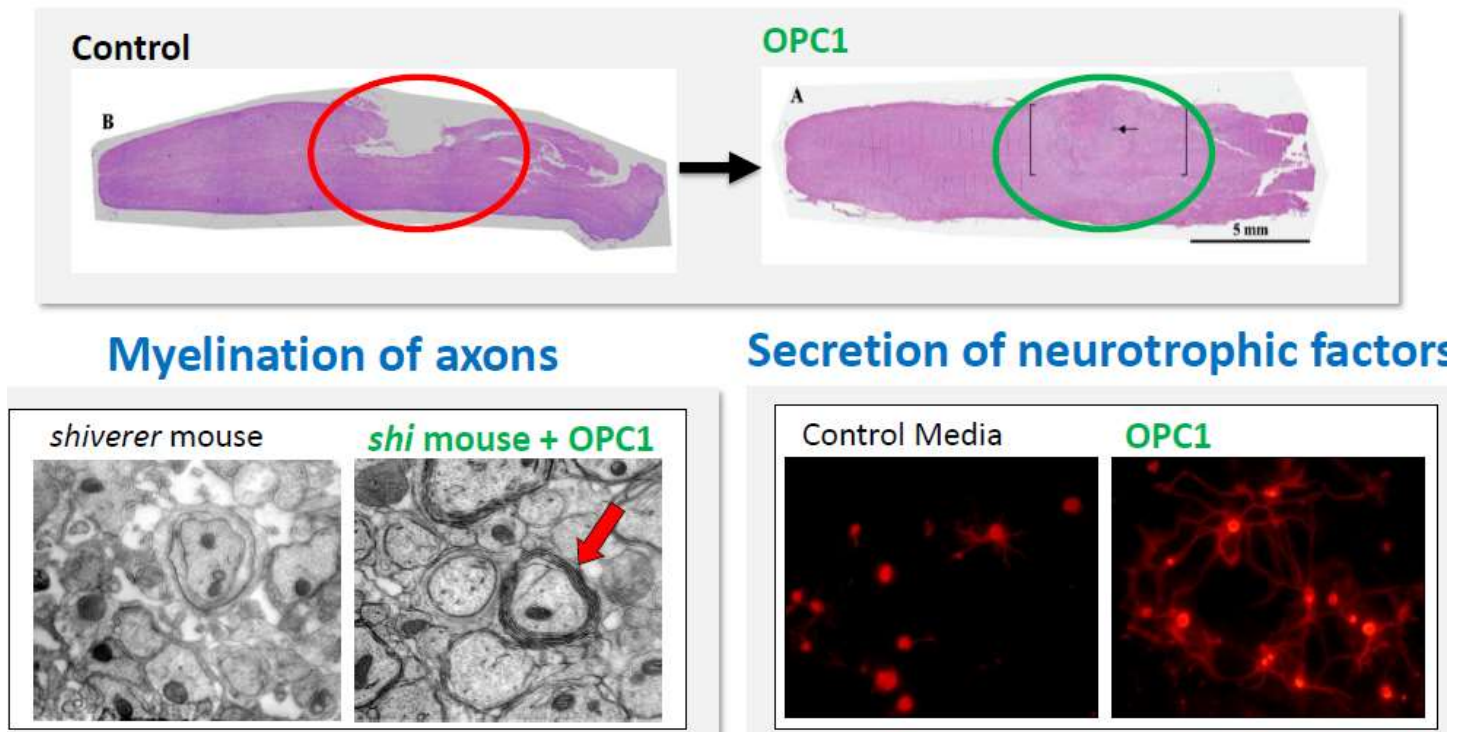
## Why Spinal Cord Injury (SCI) Matters



**Lucas Linder, an OPC1 clinical trial participant, was paralyzed from the neck down. The next year, he threw out the first pitch at a Major League Baseball game.**

Source: Lineage

Exhibit 4. OPC1 Mechanism of Action – Prevention of Cavitation

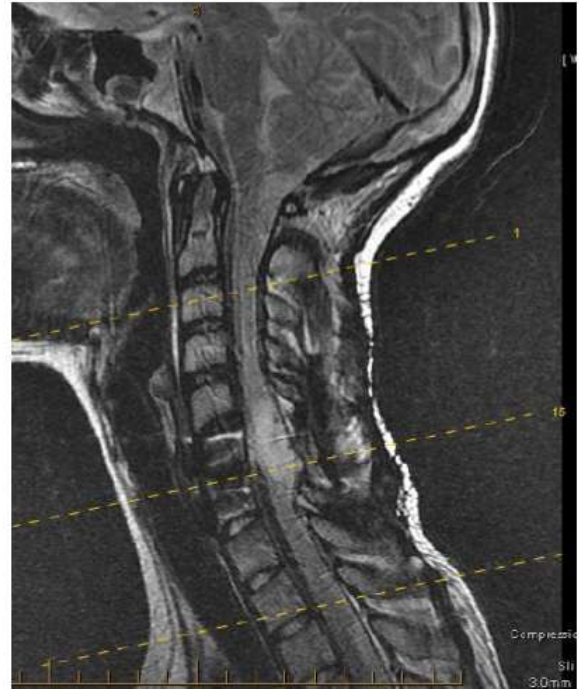


Source: Lineage

Exhibit 5. SciStar Clinical Trial – Cell Engraftment

## 12- and 24-Month MRI Scans Indicate Durable Engraftment

- Cystic cavitation (syringomyelia) occurs in ~80% of SCI cases
- MRI results suggest formation of a tissue matrix at the injury site, indicating that OPC1 cells have durably engrafted and helped prevent cavitation
- 96% (24/25) of OPC1 patients had serial MRI scans that indicated no sign of a lesion cavity at 12 months (or 24 months for 22 scans available)



Weighted sagittal MRI

Source: Lineage

### Exhibit 6. OPC1 SCI Market Model

Spinal Paralysis (OPC1)	2016A	2017A	2018A	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E
Acute spinal cord injury (C4-C7 ASIA A-C)	6,000	6,060	6,121	6,182	6,244	6,306	6,369	6,433	6,497	6,562	6,628	6,694	6,761	6,829
Growth Rate of Incidence	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Market Share (%): SCI Patients	0%	0%	0%	0%	0%	0%	0%	0%	2%	4%	6%	10%	15%	30%
Target Patient Population	0	0	0	0	0	6,306	6,369	6,433	6,497	6,562	6,628	6,694	6,761	6,829
Patients who have access, insurance- 75%	0	0	0	0	0	4,730	4,777	4,825	4,873	4,922	4,971	5,021	5,071	5,121
Unit Cost of Therapy					\$	100,000	\$	100,000	\$	101,000	\$	102,010	\$	103,030
Change in Cost of Therapy	1%	1%	1%	1%	1%	0%	0%	1%	1%	1%	1%	1%	1%	1%
Treated Patients						-	-	-	97	197	298	502	761	1,536
Number of Units per Patient	1	1	1	1	1	1	1	2	2	2	2	2	2	2
Probability of Success	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%	30%
Total Revenues (Millions)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 6	\$ 12	\$ 19	\$ 32	\$ 48	\$ 98

Source: Dawson James estimates

**Valuation.** It is difficult to predict probabilities of success from early trial data. As such, we use a low probability of success for OpRegen and OPC1 of just 30%. We model OpRegen in dry macular degeneration with geographic atrophy, as well as OPC1 in SCI, although the real driver is dry AMD as a result of the large market size. We do not model any revenues from these programs until 2023. Our models also factor in funding (dilution) using a 2029E share count of 301M shares versus the last reported share count of ~150M.

We triangulate FCFF, discounted EPS, and sum-of-the-parts models and select a 30% discount rate across these three models. The 30% discount is based on the early nature of the company's products. For companies with high visibility and positive cash flow, we typically use a discount rate of 10%; for companies with products generating revenues, approaching cash flow breakeven or better, we typically use a 15% discount rate. We then average and equally weight each model, rounded to the nearest whole number, to derive a net present value, which is where we set our price target. Investors should recognize that this modeling exercise, which is projected eight years forward, is based on the current (limited) data and estimates. As such, our ability to predict a 12-month target is strained. The price of the stock is likely to be driven in the near term by factors such as news flow, early trial data, and cyclic concerns of financings (dilution). One possible catalyst may be the approval of Renevia in Europe, which could lead to an out-license deal that could bring in additional capital to the company.

### Exhibit 7. Free Cash Flow Model (\$)

Average		6.0											
Price Target		8.6											
Year		2021											
DCF Valuation Using FCF (mln):													
units ('000)		2018A	2019A	2020A	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E
EBIT		(47,130)	19,642	(32,647)	(45,665)	(84,627)	390,860	670,137	962,059	1,358,519	2,179,494	2,138,628	2,494,832
Tax Rate		0%	0%	0%	0%	0%	0%	0%	10%	15%	20%	25%	28%
EBIT (1-t)		(47,130)	19,642	(32,647)	(45,665)	(84,627)	390,860	670,137	865,853	1,154,741	1,743,595	1,603,971	1,796,279
CapEx		(9,704)	-	-	-	-	-	-	-	-	-	-	-
Depreciation		(794)	(118)	-	-	-	-	-	-	-	-	-	-
Change in NWC													
FCF		(57,628)	19,524	(32,647)	(45,665)	(84,627)	390,860	670,137	865,853	1,154,741	1,743,595	1,603,971	1,796,279
PV of FCF		(97,391)	32,996	(42,441)	(45,665)	(65,098)	231,278	305,024	303,159	311,005	361,231	255,619	220,205
Discount Rate		30%											
Long Term Growth Rate		1%											
Terminal Cash Flow		6,256,006											
Terminal Value YE2027		766,921											
NPV		2,601,239											
NPV-Debt		-											
Shares out ('000)		300,935	2029E										
NPV Per Share		8.6											

Source: Dawson James estimates

### Exhibit 8. Discounted-EPS Model (\$)

Current Year	2021
Year of EPS	2029
Earnings Multiple	5
Discount Factor	30%
Selected Year EPS	9.67
NPV	5.9

Discount Rate and Earnings Multiple Varies, Year is Constant							
Earnings Multiple		5%	10%	15%	20%	25%	30%
	2	13.09	9.02	6.32	4.50	3.25	2.37
	5	32.73	22.56	15.81	11.25	8.11	5.93
	10	65.46	45.12	31.62	22.49	16.23	11.86
	15	98.19	67.68	47.42	33.74	24.34	17.78
	20	130.92	90.24	63.23	44.99	32.45	23.71
	25	163.65	112.80	79.04	56.23	40.57	29.64
	30	196.38	135.36	94.85	67.48	48.68	35.57
	35	229.11	157.91	110.66	78.73	56.79	41.50

Source: Dawson James estimates

### Exhibit 9. Sum-of-the-Parts Model

	LT Gr	Discount Rate	Yrs to Mkt	% Success	Peak Sales (M)	NPV
<b>Spinal Cord Paralysis</b>	1%	30%	3	30%	\$222	\$765
NPV						\$0.17
<b>Dry Macular Degeneration</b>	1%	30%	3	30%	\$5,052	\$17,421
NPV						\$3.95
<b>Renevia</b>	1%	30%	2	50%	\$40	\$139
NPV						\$0.07
Net Margin						50%
Shares Outstanding (M) in 2029E						301
Total						\$4.2

Source: Dawson James estimates

## Exhibit 10. Income Statement

Lineage: Income Statement (\$000)															
YE December 31	2019A	1Q20A	2Q20A	3Q20A	4Q20E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E
Spinal Cord Injury Therapy		-	-	-	-	-	-	-	-	5,965	12,170	18,621	31,660	48,444	97,857
Dry Macular Degeneration							-	-	674,532	1,030,069	1,396,272	1,772,071	2,156,441	2,600,414	2,971,902
Renevia		-	-	-	-	-	542	1,504	12,034	17,327	23,581	27,067	27,065	27,062	26,791
<b>Net revenue</b>							-	-	674,532	1,036,034	1,408,442	1,790,692	2,727,211	2,648,858	3,069,759
<b>Grant Revenues</b>	2,037	348	287	229	1,193	2,057	2,078	2,099	2,120	2,141	2,162	2,184	2,206	2,228	2,250
Royalties from Product Sales and license fees	1,221	166	99	342	626	1,233	1,246	1,258	1,271	1,283	1,296	1,309	1,322	1,335	1,349
Subscription & Advertisement Revenues		-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sales of Research Products & Services	257	-	-	-	260	260	262	265	267	270	273	276	278	281	284
<b>Total Revenue</b>	<b>3,515</b>	<b>514</b>	<b>386</b>	<b>571</b>	<b>2,079</b>	<b>3,550</b>	<b>3,586</b>	<b>3,622</b>	<b>678,189</b>	<b>1,039,728</b>	<b>1,412,173</b>	<b>1,794,461</b>	<b>2,731,017</b>	<b>2,652,702</b>	<b>3,073,641</b>
Cost of Goods (sales)	(412)	(94)	(75)	(102)	-	(271)	-	-	(188,869)	(259,008)	(338,026)	(322,325)	(436,354)	(397,329)	(460,464)
									28%	25%	24%	18%	16%	15%	15%
Research & Development	(17,948)	(3,339)	(2,805)	(3,566)	(4,648)	(14,358)	(14,646)	(19,039)	(28,559)	(39,982)	(40,782)	(41,598)	(42,430)	(43,278)	(44,144)
Acquired in Process Research & Development															
General & Administrative	(24,031)	(4,519)	(3,908)	(3,628)	(7,170)	(19,225)	(34,605)	(69,209.28)	(69,901)	(70,600)	(71,306)	(72,019)	(72,740)	(73,467)	(74,202)
<b>Total Expenses</b>	<b>(41,979)</b>	<b>(7,858)</b>	<b>(6,713)</b>	<b>(7,194)</b>	<b>(11,818)</b>	<b>(33,583)</b>	<b>(49,250)</b>	<b>(88,249)</b>	<b>(287,329)</b>	<b>(369,591)</b>	<b>(450,115)</b>	<b>(435,942)</b>	<b>(551,523)</b>	<b>(514,074)</b>	<b>(578,809)</b>
Loss from Operation	(38,876)	(7,438)	(6,402)	(6,725)	(9,739)	(30,304)	(45,665)	(84,627)	390,860	670,137	962,059	1,358,519	2,179,494	2,138,628	2,494,832
Interest Income (expense)	1,685	405	380	252											
Gain on AgeX shares and deconsolidation of AgeX	-														
Gain on Sale equity method in Ascendance	-	1,258	2,470	120											
Gain / Loss Oncocyte	2,421	(1,338)	(4,146)	(2,003)											
Loss on Equity (Asterias)	6,744	35	(6)	55											
Unrealized Gain on marketable equity securities	(2,898)	(1,350)	1,174	351											
Other Income (expenses) net	2,532														
Total other income (expense), net															
<b>Pretax Income</b>	<b>19,642</b>	<b>(8,428)</b>	<b>(6,530)</b>	<b>(7,950)</b>	<b>(9,739)</b>	<b>(32,647)</b>	<b>(45,665)</b>	<b>(84,627)</b>	<b>390,860</b>	<b>670,137</b>	<b>962,059</b>	<b>1,358,519</b>	<b>2,179,494</b>	<b>2,138,628</b>	<b>2,494,832</b>
Tax Benefit	(19,234)			178											
Net loss attributable to non-controlling interest	118	29	8	12		49	-	-	-	-	-	-	-	-	-
Taxes	7										96,206	203,778	435,899	534,657	698,553
<b>Tax Rate</b>											10%	15%	20%	25%	28%
<b>GAAP Net Income (Loss)</b>	<b>(11,709)</b>	<b>(8,399)</b>	<b>(6,522)</b>	<b>(7,760)</b>	<b>(9,739)</b>	<b>(32,420)</b>	<b>(45,665)</b>	<b>(84,627)</b>	<b>390,860</b>	<b>670,137</b>	<b>865,853</b>	<b>1,154,741</b>	<b>1,743,595</b>	<b>1,603,971</b>	<b>1,796,279</b>
<b>Total comprehensive loss</b>	<b>(11,709)</b>	<b>(8,399)</b>	<b>(6,522)</b>	<b>(7,760)</b>	<b>(9,739)</b>	<b>(32,420)</b>	<b>(45,665)</b>	<b>(84,627)</b>	<b>390,860</b>	<b>670,137</b>	<b>865,853</b>	<b>1,154,741</b>	<b>1,743,595</b>	<b>1,603,971</b>	<b>1,796,279</b>
<b>GAAP-EPS</b>	<b>(0.08)</b>	<b>(0.06)</b>	<b>(0.04)</b>	<b>(0.05)</b>	<b>(0.06)</b>	<b>(0.22)</b>	<b>(0.26)</b>	<b>(0.46)</b>	<b>2.13</b>	<b>3.64</b>	<b>4.69</b>	<b>6.22</b>	<b>9.36</b>	<b>8.58</b>	<b>9.57</b>
GAAP-EPS (Dil)	(0.08)	(0.06)	(0.04)	(0.05)	(0.04)	(0.19)	(0.23)	(0.17)	(0.04)	0.08	0.32	0.60	0.87	1.12	1.12
Wgtd Avg Shrs (Bas)	145,533	149,807	149,821	149,973	151,473	150,268	174,374	182,595	183,327	184,061	184,799	185,539	186,282	187,028	187,778
Wgtd Avg Shrs (Dil)	145,533	149,807	149,821	149,973	230,854	170,114	276,477	292,629	293,802	294,979	296,160	297,347	298,538	299,734	300,935

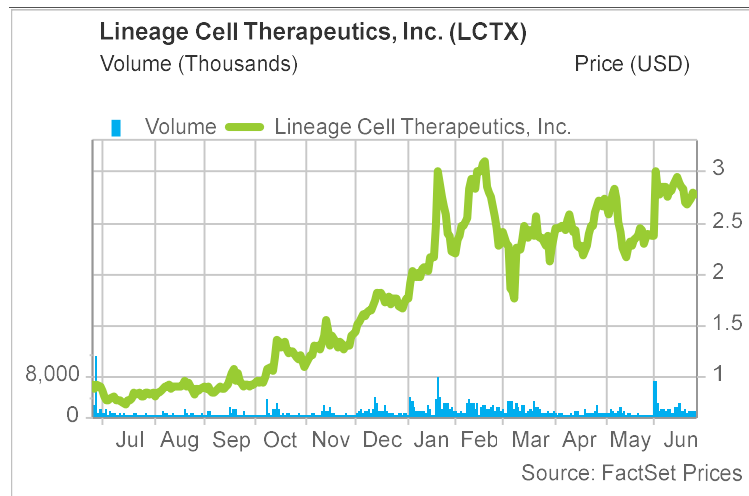
Source: Dawson James estimates, company reports

Companies mentioned in this report:

Asterias (AST)  
AgeX (AGX)  
Oncocyte (OCS)

**Important Disclosures:**

**Price Chart:**



Price target and ratings changes over the past three years:

Initiated – Buy – February 7, 2019 – Price Target \$6.00  
 Updated – May 28, 2019 – Price Target \$6.00  
 Updated – August 12, 2019 – Price Target \$6.00  
 Updated – September 19, 2019 – Price Target \$6.00  
 Updated – October 15, 2019 – Price Target \$6.00  
 Updated – January 9, 2020 – Price Target \$6.00  
 Updated – November 6, 2020 – Price Target \$6.00  
 Updated – March 9, 2021 – Price Target \$6.00  
 Updated – March 23, 2021 – Price Target \$6.00  
 Updated – May 3, 2021 – Price Target \$6.00  
 Updated – June 2, 2021 – Price Target \$6.00  
 Updated – June 25, 2021 – Price Target \$6.00

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- 1) **Buy:** The analyst believes the price of the stock will appreciate and produce a total return of at least 20% over the next 12-18 months;
- 2) **Neutral:** The analyst believes the price of the stock is fairly valued for the next 12-18 months;
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As of: 21-Jun-21

	Company Coverage		Investment Banking	
<b>Ratings Distribution</b>	# of Companies	% of Total	# of Companies	% of Totals
Market Outperform (Buy)	24	71%	4	17%
Market Perform (Neutral)	10	29%	0	0%
Market Underperform (Sell)	0	0%	0	0%
<b>Total</b>	<b>34</b>	<b>100%</b>	<b>4</b>	<b>12%</b>

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