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CytoSorbents Corporation (NASDAQ/CTSO)

October 14, 2020, 2020

BUY: EU Approval for the PerLife Ex System, which uses PerSorb Cartridge for Solid Organ Transplant (SOT)

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CytoSorbents and Aferetica srl announce the European Union approval of Aferetica's PerLife ex vivo organ perfusion system and CytoSorbents's ECOS-300CY sorbent cartridge for the removal of inflammatory mediators during ex vivo organ perfusion. The integrated system was developed in concert to improve the preservation and quality of solid organs, like the kidneys and liver, following harvest and prior to transplant into a new recipient. Aferetica and CytoSorbents have worked closely together to ensure mutual compatibility of their technologies and will introduce the PerLife System and PerSorb (ECOS-300CY) adsorber dedicated to Aferetica, with a commercial launch in Italy this quarter.

DOD (Dept. of Defense) awards \$1.1 M to the company to optimize the development of HEMODEFEND-BGA™ for Life-Saving universal plasma. The U.S. Army Medical Research Acquisition Activity (USAMRAA) has awarded the Company a two-year SBIR Sequential Phase II contract valued at \$1,098,588 to optimize development of the HemoDefend-BGA™ adsorber. The HemoDefend-BGA adsorber can rapidly remove >99% of anti-A and anti-B antibodies from plasma to create a “universal plasma” that could be administered to anyone, irrespective of blood type, while maintaining critical coagulation activity.

COVID Update: The FDA granted Emergency Use Authorization (EUA) to CytoSorb for use in adult, critically-ill COVID-19 patients with imminent or confirmed respiratory failure, enabling commercial sales to all hospitals in the U.S. for this application.

Valuation. We use a series of therapeutic models across the various indications and geographies and project product revenues for the Company out to the year 2030. In our U.S. therapeutic models, we apply a 30% risk cut (70% success probability) that both U.S. approvals and our market share forecasts can be realized. For us, valuation becomes an interesting question when we discuss the appropriate “r” risk-rate to use in our three model metrics, free cash flow to the firm (FCFF), Discounted EPS and Sum-Of-The-Parts (SOP) models, which are equal-weighted, averaged and rounded to the nearest whole number. Typically for early-stage companies with no revenues, we use 30%, and for companies with established products and revenues, we use a lower 15%. CytoSorbents arguably is somewhere in the middle, as products are approved and selling in Europe but not yet in the U.S. If we select a conservative 30%, we derive a \$9.00 price target. If we select a more aggressive 15%, we arrive at a \$26.00 target. If we select a mid-point (22.5%), we derive a \$16.00 target, which reflects the revised share count from the recent capital raise.

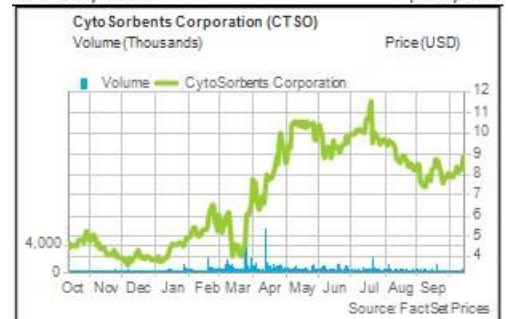
Risks. Market risks, Regulatory risks, Financial risks, and Commercialization risks.

Current Price	\$8.87
Price Target	\$16.00

Estimates	F2019A	F2020E	F2021E
Expenses (\$000s)	\$ 43,924	\$ 49,676	\$ 60,071
1Q March	\$ 9,475	\$ 11,186	\$ 13,816
2Q June	\$ 9,862	\$ 13,093	\$ 14,417
3Q September	\$ 11,723	\$ 12,459	\$ 15,618
4Q December	\$ 12,864	\$ 12,939	\$ 16,219
	F2019A	F2020E	F2021E
EPS (diluted)	\$ (0.62)	\$ (0.36)	\$ 0.23
1Q March	\$ (0.15)	\$ (0.10)	\$ 0.05
2Q June	\$ (0.11)	\$ (0.08)	\$ 0.05
3Q September	\$ (0.21)	\$ (0.09)	\$ 0.06
4Q December	\$ (0.14)	\$ (0.09)	\$ 0.06

EBITDA/Share	(\$0.63)	(\$0.41)	\$0.25
EV/EBITDA (x)	0.0	0.0	0.0

Stock Data			
52-Week Range	\$3.49	-	\$11.74
Shares Outstanding (mil.)	43.2		
Market Capitalization (mil.)	\$383		
Enterprise Value (mil.)	\$363		
Debt to Capital	0%		
Book Value/Share	\$0.35		
Price/Book	36.7		
Average Three Months Trading Volume (K)	786		
Insider Ownership	11.3%		
Institutional Ownership	26.5%		
Short interest (mil.)	6.9%		
Dividend / Yield	\$0.00/0.0%		



Please find Important Disclosures beginning on Page 6.

Modeling Assumptions

- 1. We assume continued steady growth for CytoSorb in the current key EU direct sales countries of Germany, Austria, and Switzerland.
2. We assume a selling price per cartridge of \$1,000 for direct sales and \$600 for distribution sales. We estimate that each patient will require an average of five units (CytoSorb cartridges) for sepsis treatment and three units for cardiac treatment.
3. We conservatively assume that CytoSorb can achieve a ten percent market share of the market in Germany, Austria, and Switzerland, and 3% of the market in the rest of the EU by 2030.
4. Our model includes CytoSorb revenues in the U.S. for cardiac surgery and sepsis beginning in 2022 upon commercialization. To these revenues, we apply a 70% probability of success (or 30% risk cut).

Exhibit 1. CytoSorb sepsis EU direct sales (Germany, Austria, and Switzerland)

Table with 12 columns (2018E-2030E) and multiple rows showing population statistics, market penetration, total patients, revenue, and risk factors for CytoSorb sepsis EU direct sales.

Source: Dawson James estimates, company reports

Exhibit 2. CytoSorb sepsis EU sales by distributorship (excluding Germany, Austria, and Switzerland)

Table with 12 columns (2018E-2030E) and multiple rows showing population statistics, market penetration, total patients, revenue, and risk factors for CytoSorb sepsis EU sales by distributorship.

Source: Dawson James estimates, company reports

Exhibit 3. CytoSorb U.S. sales for cardiac surgery

Table with 12 columns (2018E-2030E) and multiple rows showing US population, cardiac surgery statistics, market penetration, total addressable patients, estimated units per patient, total filter needed, cost of therapy, revenue, and risk factor.

Source: Dawson James estimates, company reports

Exhibit 4. CytoSorb EU sales for cardiac surgery

Table with 12 columns (2018E-2030E) and multiple rows showing EU cardiac surgery statistics, market penetration, total addressable patients, estimated units per patient, total filter needed, cost of therapy, revenue, and risk factor.

Source: Dawson James estimates, company reports

Exhibit 5. CytoSorb U.S. sales for sepsis

Table with 12 columns (2018E-2030E) and multiple rows showing US sepsis statistics, severe sepsis patients, market penetration, total addressable patients, estimated units per patient, total filter needed, cost of therapy, revenue, and risk factor.

Source: Dawson James estimates, company reports

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Exhibit 6. FCFF Model

Average \$	16
Price Target \$	16
Year	2020

DCF Valuation Using FCF (mln):

units ('000)	2018A	2019A	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E
EBIT	(17,830)	(20,358)	(14,599)	9,301	32,034	83,013	147,875	252,067	315,248	356,152	386,456	405,408	401,536
Tax Rate	0%	5%	8%	10%	12%	15%	18%	21%	24%	28%	33%	33%	33%
EBIT (1-t)	(17,830)	(19,340)	(13,431)	8,371	28,190	70,561	121,257	199,133	239,589	256,429	258,926	271,623	269,029
CapEx	(493)	(698)	(768)	(845)	(929)	(1,022)	(1,124)	(1,237)	(1,361)	(1,497)	(1,646)	(1,811)	(1,992)
Depreciation	391	582	667	-	-	-	-	-	-	-	-	-	-
Change in NWC	-	-	-	-	-	-	-	-	-	-	-	-	-
FCF	(17,932)	(19,457)	(13,531)	7,526	27,261	69,539	120,133	197,896	238,228	254,933	257,279	269,812	267,037
PV of FCF	(26,910)	(23,834)	(13,531)	6,144	18,166	37,828	53,348	71,739	70,498	61,585	50,736	43,435	35,092
Discount Rate	22.5%												
Long Term Growth Rate	1%												
Terminal Cash Flow	1,254,453												
Terminal Value YE2030	164,852												
NPV	599,892												
NPV-Debt	-												
Shares out ('000)	37,991	2030E											
NPV Per Share	16												

Source: Dawson James estimates, company reports

Exhibit 7. Discounted EPS Model

Current Year	2020
Year of EPS	2030
Earnings Multiple	15
Discount Factor	22.5%
Selected Year EPS	7.08
NPV	13.96

Source: Dawson James estimates

Discount Rate and Earnings Multiple Varies, Year is Constant							
	13.96	5%	10%	15%	20%	25%	30%
Earnings Multiple	0	0.00	0.00	0.00	0.00	0.00	0.00
	5	20.19	12.68	8.13	5.31	3.53	2.39
	10	40.38	25.36	16.26	10.62	7.06	4.77
	15	60.57	38.04	24.39	15.93	10.59	7.16
	20	80.76	50.72	32.52	21.25	14.13	9.54
	25	100.95	63.40	40.65	26.56	17.66	11.93
	30	121.14	76.08	48.78	31.87	21.19	14.31
	35	141.33	88.76	56.91	37.18	24.72	16.70

Source: Dawson James estimates

Exhibit 8. Sum of the Parts Model

CytoSorbents	LT Gr	Discount Rate	Yrs to Mkt	% Success	Peak Sales (MMs)	Term Val
CytoSorb - Sepsis Direct Sales(EU)	1%	22.5%	0	70%	\$151	\$701
NPV						\$7
CytoSorb - Sepsis Distributor (EU)	1%	22.5%	0	70%	\$88	\$408
NPV						\$4
CytoSorb (Cardiac surgery US)	1%	22.5%	2	50%	\$68	\$318
NPV						\$1.53
CytoSorb (Cardiac surgery EU)	1%	22.5%	0	70%	\$17	\$79
NPV						\$0.8
CytoSorb (Sepsis US)	1%	22.5%	4	50%	\$271	\$1,262
NPV						\$4.1
Net Margin						55%
MM Shrs OS (2030E)						38
Total						\$18

Source: Dawson James estimates

Risk Analysis

Market Share Risk: CytoSorbents' potential inability to further grow product sales in the EU will hinder its profitability as more capital is invested in clinical trials to bring CytoSorb to the U.S. market. The Company's product represents a new treatment for critical care patients that may take longer for adoption than predicted.

Regulatory Risk: There may be certain regulatory risks related to CytoSorb approval in the U.S.

Commercial Risk: There is no guarantee that the Company will be able to develop and expand sales operations to offset research and development costs. Delays in U.S. commercialization will be negatively reflected in its valuation.

Financial Risk: The Company should be expected to raise capital in the near term. We assume a raise and dilution, but there is no guarantee that market conditions will be favorable.

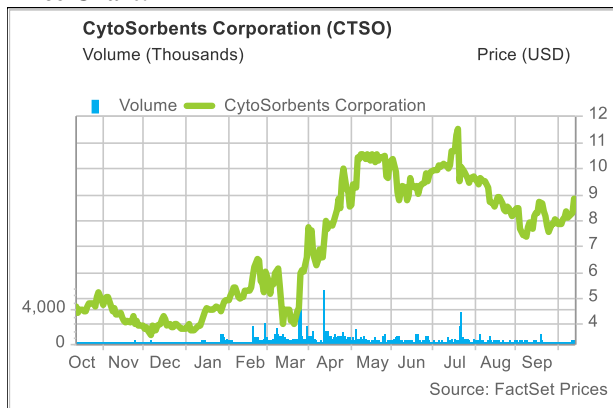
Exhibit 9. Income Statement

CTSO: Income Statement (\$000)																					
YE December 31	1Q19A	2Q19A	3Q19A	4Q19A	2019A	1Q20A	2Q20A	3Q20E	4Q20E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E	
Revenue:																					
CytoSorb Direct Sales (Germany, Austria, Switzerland)	4,576	5,850	5,728	6,612	22,766	5,050	5,500	5,590	5,805	21,500	40,239	54,439	69,046	84,070	99,520	115,405	131,735	148,520	150,699	150,699	
CytoSorb Distributor (Rest of EU)	-	-	-	-	-	2,350	2,800	2,497	2,593	9,602	13,336	21,587	27,297	41,422	55,871	70,651	85,766	86,763	87,771	87,771	
CytoSorb (Cardiac surgery EU)	-	-	-	-	-	710	1,160	780	810	3,000	6,866	9,218	11,604	14,022	16,474	16,589	16,705	16,822	16,940	16,940	
CytoSorb (Cardiac surgery US)	-	-	-	-	-	-	-	-	-	-	-	-	16,294	21,899	27,593	66,755	67,290	67,829	68,373	68,373	
CytoSorb (sepsis US)	-	-	-	-	-	-	-	-	-	-	8,773	17,846	45,376	92,302	187,755	200,508	223,353	246,919	271,225	271,225	
VetResQ	-	-	-	-	-	45	60	39	41	150	158	165	174	182	191	-	-	-	-	-	
Other Sales	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total Product Sales	4,576	5,850	5,728	6,612	22,766	8,155	9,520	8,906	9,248	34,252	69,372	103,255	169,790	253,897	387,404	469,908	524,849	566,853	595,008	595,008	
Royalty (HemoDefend US)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Grant revenue	615	382	367	820	2,184	551	275	-	-	826	-	-	-	-	-	-	-	-	-	-	
Other revenue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Revenue	5,191	6,232	6,095	7,432	24,950	8,706	9,795	8,906	9,248	35,078	69,372	103,255	169,790	253,897	387,404	469,908	524,849	566,853	595,008	595,008	
Expenses:																					
Costs of Goods Sold	1,738	1,834	1,696	2,096	7,364	2,385	3,250	1,781	1,850	9,265	13,874	20,651	33,958	50,779	77,481	93,982	104,970	113,371	119,002	119,002	
%COGS	38%	29%	25%	25%	25%	29%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
Research and Development	2,418	2,930	3,185	3,559	12,092	1,965	2,406	3,458	3,591	13,301	14,631	16,094	17,704	19,474	21,422	23,564	25,920	28,512	31,364	34,500	
%R&D	53%	50%	56%	54%	53%	24%	25%	39%	39%	39%	21%	16%	10%	8%	6%	5%	5%	5%	5%	6%	6%
Selling, General and Administrative	4,758	4,506	6,108	6,634	22,006	6,317	6,591	6,580	6,833	25,307	29,103	32,013	32,653	33,307	33,973	34,652	35,345	36,052	36,773	37,509	
%SG&A	104%	77%	107%	100%	97%	77%	69%	74%	74%	74%	42%	31%	19%	13%	9%	7%	7%	6%	6%	6%	6%
Legal, financial and other counseling	561	592	733	576	2,462	519	846	640	665	2,462	2,462	2,462	2,462	2,462	2,462	2,462	2,462	2,462	2,462	2,462	
Total Expenses	9,475	9,862	11,723	12,864	43,924	11,186	13,093	12,459	12,939	49,676	60,071	71,221	86,777	106,022	135,337	154,660	168,897	180,397	189,600	193,472	
Operating Income (Loss)	(4,284)	(3,630)	(5,628)	(5,432)	(18,974)	(2,480)	(3,298)	(3,554)	(3,690)	(14,599)	9,301	32,034	83,013	147,875	252,067	315,248	356,152	386,456	405,408	401,536	
Interest income (expense), net	(205)	(214)	(302)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Gain (loss) on foreign currency transactions	(393)	297	(956)	(332)	(1,384)	(668)	(274)	-	-	-	-	-	-	-	-	-	-	-	-	-	
Change in warrant liability	-	-	-	-	-	(306)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other income (expense), net	-	-	-	-	-	705	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Other Income	(598)	83	(1,258)	(332)	(1,384)	(974)	431	-	-	-	-	-	-	-	-	-	-	-	-	-	
Pretax Income	(4,882)	(3,547)	(6,886)	(5,764)	(20,358)	(3,454)	(2,867)	(3,554)	(3,690)	(14,599)	9,301	32,034	83,013	147,875	252,067	315,248	356,152	386,456	405,408	401,536	
Income Tax Benefit (Provision)	-	-	-	1,092	1,092	-	-	(284)	(295)	(1,168)	930	3,844	12,452	26,617	52,934	75,660	99,723	127,531	133,784	132,507	
Tax Rate	0%	5%	5%	5%	5%	8%	8%	8%	8%	8%	10%	12%	15%	18%	21%	24%	28%	33%	33%	33%	33%
GAAP Net Income (Loss)	(4,882)	(3,547)	(6,886)	(4,672)	(19,266)	(3,454)	(2,867)	(3,270)	(3,395)	(13,431)	8,371	28,190	70,561	121,257	199,133	239,589	256,429	258,926	271,623	269,029	
GAAP-EPS	(0.15)	(0.11)	(0.21)	(0.14)	(0.62)	(0.10)	(0.08)	(0.09)	(0.09)	(0.36)	0.23	0.77	1.91	3.27	5.35	6.41	6.83	6.87	7.18	7.08	
GAAP-EPS (Dil)	(0.15)	(0.11)	(0.21)	(0.14)	(0.60)	(0.10)	(0.08)	(0.09)	(0.09)	(0.37)	0.23	0.77	1.91	3.27	5.35	6.41	6.83	6.87	7.18	7.08	
Wgtd Avg Shrs (Bas) - '000s	31,931	32,267	32,366	32,450	32,253	33,981	36,483	36,520	36,556	35,885	36,648	36,795	36,942	37,090	37,239	37,388	37,538	37,688	37,839	37,991	
Wgtd Avg Shrs (Dil) - '000s	31,931	32,267	32,366	32,450	32,253	33,981	36,483	36,520	36,556	35,885	36,648	36,795	36,942	37,090	37,239	37,388	37,538	37,688	37,839	37,991	

Source: Dawson James estimates and company reports

Important Disclosures:

Price Chart:



Price target and rating changes over the past three years:

- Initiated – Buy – July 11, 2019 – Price Target \$15.00
- Update – Buy – August 12, 2019 – Price Target \$15.00
- Update – Buy – August 15, 2019 – Price Target \$15.00
- Update – Buy – August 19, 2019 – Price Target \$15.00
- Update – Buy – November 6, 2019 – Price Target \$15.00
- Update – Buy – February 19, 2020 – Price Target \$15.00
- Price Target Increase – Buy – March 9, 2020 – Price Target \$17.00
- Update – Buy – March 25, 2020 – Price Target \$17.00
- Update – Buy – April 13, 2020 – Price Target \$17.00
- Update – Buy – May 6, 2020 – Price Target \$17.00
- Update – Buy – June 9, 2020 – Price Target \$17.00
- Update – Buy – July 31, 2020 – Price Target \$15.00
- Update – Buy – August 12, 2020 – Price Target \$16.00
- Update – Buy – September 16, 2020 – Price Target \$16.00
- Update – Buy – October 14, 2020 – Price Target \$16.00

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Information about valuation methods and risks can be found in the "VALUATION" and "RISK ANALYSIS" sections of this report.

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Rating Definitions:

- 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;
- 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)	23	85%	4	17%
Market Perform (Neutral)	4	15%	1	25%
Market Underperform (Sell)	0	0%	0	0%
Total	27	100%	5	19%

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