

Update (May 23, 2018)

Amarantus Bioscience Holdings, Inc. (OTC: AMBS)

Target Price: \$0.65

Based in San Francisco, CA, Amarantus Bioscience Holdings, Inc. (OTC:AMBS, "Amarantus") is a biotechnology company developing treatments and diagnostics for diseases in orphan neurologic, regenerative medicine and ophthalmic therapies, through three wholly-owned subsidiary companies. The company's **Elto Pharma** subsidiary has development rights to *eltoprazine*, a Phase 2b-ready small molecule indicated for Parkinson's disease levodopa-induced dyskinesia (PD-LID), Alzheimer's aggression and adult ADHD. Amarantus has also acquired the rights to the Engineered Skin Substitute program (ESS), a Phase 3 ready regenerative medicine-based approach for treating severe burns with full-thickness autologous skin grown in tissue culture, which is being pursued by its subsidiary **Cutanogen Corporation**. Amarantus' subsidiary **MANF Therapeutics, Inc.** is developing pre-clinical products as treatments for brain and ophthalmic disorders, which were discovered by CEO John Commissiong, PhD using its proprietary discovery engine *PhenoGuard*. AMBS also owns in excess of 110mn shares of Avant Diagnostics, Inc. (OTC: AVDX) via deal to reacquire assets.

Investment Highlights

Amarantus recently provided an update on its business activities on May 11, 2018, which included an overview of the company's strategy and progress made formulating its plan to create and monetize four subsidiary companies. Highlights of recent activities include:

- Amarantus will initially seek to realize value for its Elto Pharma and Cutanogen subsidiaries. Management views Elto Pharma's Phase 2, small molecule candidate *eltoprazine* as the most valuable asset in the company. Originally developed by Solvay (now Abbvie) for aggression-related indications, *eltoprazine* has a strong safety record, and an Orphan Designation for PD-LID. Moreover, *eltoprazine* offers a broader opportunity to target several multi-billion dollar markets, including: Parkinson's Disease (\$2bn), Agitation in Alzheimer's Disease (\$3bn) and ADHD – Adult and Pediatric (\$1bn). The company is planning an IPO / spinoff for Elto Pharma in order to raise capital to advance clinical progress for *eltoprazine* and more efficiently realize value for this key asset.
- *AMBS files 2017 10K, 1Q18 10Q, retains Weild & Co.* We also note that AMBS has been able to make progress catching up on its SEC filings. AMBS filed its 2017 10-K on April 18, 2018, reporting a net loss of \$4.4mn in 2017, and filed 1Q18 10Q on May 21, 2018. The company recently brought in Barney Monte as interim CFO / COO to assist to assist in completing the company's restructuring plan and concurrent capital raise via regulations created under JOBS Act. We were pleased to see the company file its 2017 annual report in a timely manner and note the company announced that it had engaged Weild & Co. to advise Amarantus for planned capital raises using mechanisms created under the JOBS Act.

No change to target at this time

We recently updated the price target for AMBS to \$0.65 following based on the potential value from advancing candidates at Elto Pharma and Cutanogen, taking into consideration the liabilities at the AMBS level. We see the AMBS as a high risk, high potential reward company emerging from distressed status. We would look to re-evaluate the target and valuation following additional details and timing for any such strategic transaction.

Stock Details (5/22/18)

OTC:	AMBS
Sector / Industry	Healthcare/ Biotechnology
Price target	\$0.65
Recent share price (intraday)	\$0.04
Shares o/s (mn)	196
Market cap (in \$mn)	7.8
52-week high/low	\$0.21 / 0.01

Source: Thomson Reuters, SeeThruEquity Research

Key Financial (\$mn, unless specified)

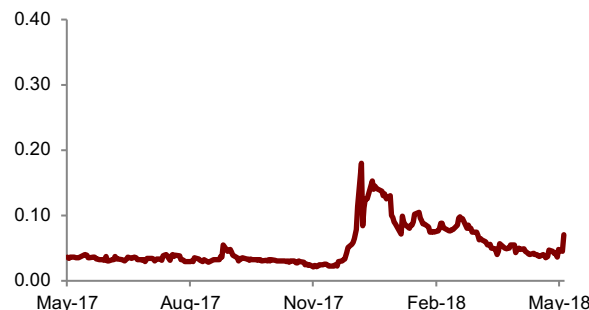
	FY16	FY17	FY18E
Revenues	0.0	0.0	0.0
EBITDA	(8.6)	(3.2)	(5.0)
EBIT	(8.6)	(3.2)	(5.0)
Net Income	(11.6)	(4.4)	(5.0)
EPS (\$)	(1.29)	(0.05)	(0.03)

Source: SeeThruEquity Research

Key Ratios

	FY16	FY17	FY18E
Gross margin (%)	NM	NM	NM
Operating Margin (%)	NM	NM	NM
EBITDA margin (%)	NM	NM	NM
Net margin (%)	NM	NM	NM
P/Revenue (x)	NM	NM	NM
EV/EBITDA (x)	NM	NM	NM
EV/Revenue (x)	NM	NM	NM

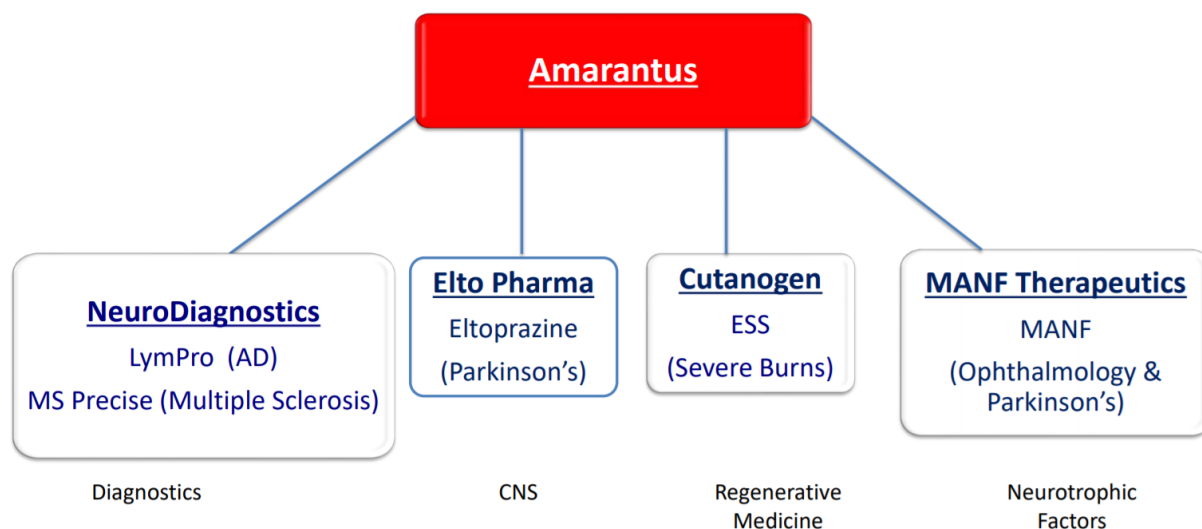
Source: SeeThruEquity Research



Source: Yahoo! Finance

Amarantus provides comprehensive business update as company prepares to extract value for Elto and Cutanogen subsidiaries

- Amarantus provided a business update on May 11, 2018. During the announcement the company highlighted recent strategic decisions to operate Amarantus as a holding company and store its assets in multiple subsidiaries. Each subsidiary has a distinct clinical focus, and Amarantus management has articulated a goal to raise capital to capture value from and advance the assets of each subsidiary, beginning with a spinoff / IPO process for its Elto Pharma and Cutanogen subsidiaries.
- Over the last year, Amarantus has consolidated its IP into four groupings, including three subsidiary companies. These include Elto Pharma Inc. and MANF Therapeutics, which were each formed during the last year, as well as its existing subsidiary, Cutanogen Corporation, making three subsidiary companies in total developing orphan therapeutic assets for neurology, regenerative medicine, and ophthalmology. During calendar 2Q18, Amarantus also announced that it has reacquired the rights to its Alzheimer's Blood Diagnostic LymPro Test for the diagnosis of Alzheimer's Disease, and MS diagnostic MSPrecise.
- Amarantus has already named Chief Medical Advisors for three subsidiaries: Paula Trzepacz, MD at Elto Pharma, Richard Kagan, MD at Cutanogen Corporation and Michael Ropacki, PhD at LymPro. The company presented the following graphical representation of its strategy highlighting the its four groups: NeuroDiagnostics, EltoPharma, Cutanogen, and MANF Therapeutics.



Source: Company

- Amarantus likely to seek to monetize Elto Pharma subsidiary first.** Amarantus has stated that it will initially seek to extract value from its Elto Pharma subsidiary, likely through an IPO or spinoff transaction. Elto Pharma has development rights to *eltoprazine*, a Phase 2b-ready small molecule which is indicated for Parkinson's disease levodopa-induced dyskinesia (PD-LID), Alzheimer's aggression / agitation and adult ADHD.
- PD-LID is the primary side effect of the current standard of care for Parkinson's Disease (Levodopa), and affects approximately 188,000 patients in the US. Eltoprazine is an orally administered, small molecule candidate that is a selective 5HT1a/1b partial agonist, which was originally developed by Solvay (now Abbvie).
- Management believes that, based on a third party valuation of the PD-LID indication in the US and Europe, that eltoprazine is the most valuable risk-adjusted asset in its portfolio. Eltoprazine is in Phase 2b clinical development and has an orphan drug designation in PD-LID with IP protection through 2032 for Parkinson's and a strong safety profile demonstrated in 680 subjects.

- Amarantus believes there is a \$2 billion market opportunity for eltoprazine in PD, with potential additional large market opportunities for Agitation in Alzheimer's Disease (\$3 billion) and ADHD – Adult and Pediatric (\$1 billion).
- Amarantus has also provided a collection of what management views as peers in the CNS space, and their valuation at comparable development timelines, in the following table. The company has stated publicly that it is in the process of raising a round of private financing for Elto Pharma, which will be followed by preparations for an initial public offering.

Valuation							
IPO	Today	Company	Preclinical	Phase 1	Phase 2	Phase 3	Market
\$1.5B	\$125M	Axovant	Phase 2 complete at IPO				
\$120M	\$800M+	Adamas	Phase 2 complete at IPO				★
	<u>3rd party Valuation in process</u>	Elto Pharma	Phase 2a complete at IPO				
\$110M	\$2B	Acadia	In Phase 2a at IPO				★
\$295M	\$630M	Acorda	Phase 1 Complete at IPO				★
\$180M *acquired by	\$625M Sunovion 2017	Cynapsus	Phase 2a complete at listing				★

Source: Company Investor Materials April 2018

Additional opportunities remain beyond Elto

- Beyond Elto Pharma, Amarantus has also acquired the rights to the Engineered Skin Substitute program (ESS), a Phase 3 ready regenerative medicine-based approach for treating severe burns with full-thickness autologous skin grown in tissue culture, which is being pursued by its subsidiary Cutanogen Corporation. Data published in April 2017 in the Journal of Burn Care Research showed that ESS reduced pediatric severe burn mortality versus a historical control by up to 75%, while covering 27x greater body surface/harvest versus the standard of care. Additional advantages of ESS include dramatically shortening the length of hospital stays for severe burn victims, with fewer reconstructive / revision surgeries and less mental and emotional rehabilitation. Management believes that Cutanogen is likely to be the second subsidiary to undergo a spin off / IPO process.
- Additionally, on May 4, 2018 the company announced that it had entered into an option agreement with an exclusive option agreement with Leipzig University to license rights to "LymPro Test 2.0." The agreement grants Amarantus the exclusive option to evaluate LymPro Test 2.0, which is being designed as a diagnostic for Alzheimer's disease. The company and Leipzig are initiating a second confirmatory for LymPro PET 2 study that has begun enrollment.

No change to \$0.65 price target as AMBS plans begin to take shape

- While AMBS remains a high risk company emerging from financial distress, with a market capitalization of just \$7.9mn as of May 17, 2018, versus an all-time high of \$160mn, there exists significant potential for upside if management can execute on its plans to monetize the clinical programs in its wholly-owned subsidiaries.
- We updated the price target of AMBS to \$0.65 in December 2017 based on the potential value from advancing candidates at Elto Pharma and Cutanogen, taking into consideration the liabilities at the AMBS level and ongoing restructuring activities at the company. We will review the valuation and target in the future as plans progress to realize value for these subsidiaries.
- We see the AMBS as a high risk company offering significant potential if it can execute as it emerges from distressed status. We would look to re-evaluate the target and valuation following more detail related to progress on the planned Reg A listings for AMBS or subsidiary companies Elto and/or Cutanogen, which would have potential to unlock value.

RECENT FINANCIAL SUMMARY

Figure 1. Income Statement Summary

Figures in \$ unless specified	1Q18	2017
Total Revenue	0	0
YoY growth	NM	NM
Research & Development	10,454	0
General & Administrative	389,639	3,214,711
Operating Expenses	400,093	3,214,711
Operating Margin	NM	Nm
Operating Income	(400,093)	(3,214,711)
Interest, Other Items, Taxes	1,597,058	(1,222,928)
Taxes	0	0
Net income/(loss)	(1,196,964)	(4,437,639)
Net Margin	NM	NM

Source: Company Earnings Release, STE Research

Management Team

Gerald E. Commissiong, President & Chief Executive Officer

Mr. Commissiong is President & CEO, Co-Founder and a member of the Board of Directors of Amarantus Bioscience Holdings, Inc. Mr. Commissiong has been responsible for leading the Company's strategic transactions, licensing, research collaborations, mergers and acquisitions, and fund raising. He has raised over of \$25 million to acquire and develop assets to build a robust therapeutics and diagnostics pipeline. Prior to becoming CEO in October 2011, Mr. Commissiong was the Chief Operating Officer. Prior to co-founding Amarantus, Mr. Commissiong played professional football for the Calgary Stampeders of the Canadian Football League. Mr. Commissiong received a B.Sc. in Management Science and Engineering with a focus on Financial Decisions from Stanford University.

Brian E. Harvey, Md, Phd, Chief Regulatory Advisor

Dr. Harvey recently served as Vice President of U.S Regulatory Strategy at Pfizer, where he led U.S. FDA regulatory interactions across all Pfizer business units and was a member of the CEO's Senior Leadership Council (SLC). He led the Pfizer efforts on the PhRMA Regulatory Affairs Coordinating Committee (RACC). In addition, he was responsible for supervisory oversight of U.S. Regulatory Policy & Intelligence functions and the U.S. Advertising & Promotion activities. He played an early role in PDUFA VI Preparation, the PhRMA Steering Committee and the 21st Century Cures initiatives.

Prior to his time at Pfizer, Dr. Harvey served as Vice President of Regulatory Policy at Sanofi, where he was the head Liaison with U.S. Food and Drug Administration (FDA), served on the International Biologics and Biotechnology Taskforce and Biologics Key Issues Team, was on the Biotechnology Industry Organization (BIO) Regulatory Affairs Committee (RAC). He was the Signatory authority for Sanofi written comments to the FDA docket and was a Member of the Sanofi Policy Development Committee.

Prior to Sanofi, Dr. Harvey spent 11 years with FDA in increasing positions of responsibility across the organization including Center for Drug Evaluation and Research (CDER), Center for Biologics Evaluation and Research (CBER) and the Center for Devices and Radiological Health (CDRH). From 2000 to 2001, Dr. Harvey served as an American Political Science Association (APSA) Congressional Fellow on behalf of FDA. Dr. Harvey received his PhD, then MD from the University of Connecticut.

His Internal Medicine Internship and Residency at Beth Israel Hospital/Harvard was followed by a 3-year Gastroenterology/Hepatology Fellowship at Johns Hopkins Hospital prior to joining FDA.

Barney Monte, Interim Chief Financial Officer and Chief Operating Officer

Mr. Monte has over 20 years of experience in the financial services industry where he has held senior level positions within investment banking and private equity. Mr. Monte co-founded Ozado Partners LLC, a direct investment and merchant banking business, where he was responsible for sourcing, structuring and negotiating investment opportunities across various industries, including the acquisition of an ~80 megawatt natural gas-fired combined cycle power plant and cogeneration facility. Prior to co-founding Ozado Partners, Mr. Monte's senior-level investment banking positions included head of International and Asia investment banking for a middle market focused U.S. based broker-dealer. Over his tenure, Mr. Monte has acted as a principal and agent in assisting companies raise private capital, IPOs, secondary offerings, debt offerings and M&A advisory services where he has invested, raised or advised on over \$10.0 billion worth of transactions. Mr. Monte graduated from Skidmore College with a Bachelor of Science in Business Administration with a concentration in Finance.

Elise Brownell, Ph.D. Senior Vice President of Operations and Project Management

Dr. Brownell joined Amarantus in December 2014 and has more than 20 years of biotechnology and pharmaceutical project management experience with a proven track record of advancing programs through clinical development. She serves as a Life Sciences entrepreneurial advisor for ASTIA, the nation's premier entrepreneurial organization focused on women-led businesses. Dr. Brownell is also a member of the Editorial Advisory Board for Contract Pharma Magazine, and previous Chair of the Leaders Network program of Women in Consulting. She is the co-founder of ZephyrBiotech, LLC, a project management firm dedicated to advancing therapeutic candidates through development to key inflection points for clients. Earlier, Dr. Brownell was a founding member, head of project management and senior director of Aerovance, Inc., a venture-backed biotechnology company spun out from Bayer Healthcare, where she created and managed effective team processes to bring product candidates into full scale clinical Phase 1 and 2 development. Prior to Aerovance, Dr. Brownell acted as head of project management for Bayer's Biotechnology Unit, where she integrated project strategies to meet therapeutic and market needs. Other roles included building and negotiating partnerships with third parties to support development programs, leading research teams through early bench-to-clinic development phases, as well as entrepreneurial investment experience with Angel's Forum. Dr. Brownell received her M.S., M.Phil. and Ph.D. in biology from Yale University and her B.S. in biology from Allegheny College.

John W. Commissiong, Phd, Chief Scientific Officer

Dr. Commissiong has served as the Chief Scientific Officer and a Director of Amarantus since co-founding the company in 2008. Prior to Amarantus, Dr. Commissiong served as the CSO of Neurotophics, Inc. and Prescient Neuropharma, Inc. Throughout his distinguished career, Dr. Commissiong has been focused on the discovery of novel neurotrophic factors for the treatment of neurodegenerative diseases as well as understanding the fundamental underlying biology of protoplasmic type-1 astrocytes that secrete neurotrophic factors. He was Chief of the Neural Transplantation Unit, NINDS-NIH, from 1989-94 where his research focused on identifying therapeutic approaches to spinal cord injury. Dr. Commissiong was Head of the Neurotrophic Factors Group, NINDS-NIH, from 1994-97 where he focused on developing technologies to systematically identify novel neurotrophic factors with applications for specific Central Nervous System disorders. He co-founded Prescient Neuropharma in 1999, and discovered MANF in 2003. The work pioneered by Dr. Commissiong has led to significant advancements in the field of astrocyte-neuron biology. Dr. Commissiong did his Postdoctoral work in the Lab Preclin Pharmac, NIMH-NIH, concentrating on the application of quadrupole mass spectrometry in the analysis of neurotransmitters. He holds a Ph.D. in Neurophysiology from the University of Southampton, a M.Sc. in Biochemical Pharmacology from the University of Southampton, and a B.S. in Biology and Chemistry from the University of the West Indies.

About Amarantus Bioscience Holdings, Inc.

Amarantus Bioscience Holdings (AMBS), a JLABS alumnus company, is a biotechnology company developing treatments and diagnostics for diseases in the areas of neurology, regenerative medicine and orphan diseases through its subsidiaries. AMBS' wholly-owned subsidiary Elto Pharma, Inc. has development rights to eltoprazine, a Phase 2b-ready small molecule indicated for Parkinson's disease levodopa-induced dyskinesia, Alzheimer's aggression and adult attention deficit hyperactivity disorder, commonly known as ADHD. AMBS acquired the rights to the Engineered Skin Substitute program, a regenerative medicine-based approach for treating severe burns with full-thickness autologous skin grown in tissue culture that is being pursued by AMBS' wholly-owned subsidiary Cutanogen Corporation. AMBS' wholly-owned subsidiary MANF Therapeutics, Inc. owns key intellectual property rights and licenses from a number of prominent universities related to the development of the therapeutic protein known as mesencephalic astrocyte-derived neurotrophic factor ("MANF"). MANF Therapeutics, Inc. is developing MANF-based products as treatments for brain and ophthalmic disorders. MANF was discovered by the Company's Chief Scientific Officer John Commissiong, PhD. Dr. Commissiong discovered MANF from AMBS' proprietary discovery engine PhenoGuard. AMBS also owns approximately 79.25 million shares of Avant Diagnostics, Inc. (OTC Pink:AVDX) via the sale of its wholly-owned subsidiary Amarantus Diagnostics, Inc. that occurred in May 2016. Amarantus.com

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