Zacks Small-Cap Research

Sponsored – Impartial - Comprehensive

June 3, 2020
John D. Vandermosten, CFA
312-265-9588 / jvandermosten@zacks.com

scr.zacks.com **10 S. Riverside Plaza, Suite 1600, Chicago, IL 60606**

Tenax Therapeutics, Inc. (TENX-NASDAQ)

Target Up on Solid HELP Results

Based on our DCF model and a 15% discount rate, TENX is valued at approximately $6.50 per share. We apply a 25% probability of eventual sales of Levosimendan in the United States.

Current Price (6/1/20)	$1.64
Valuation	**$6.50**

OUTLOOK

Tenax has licensed the *calcium sensitizer/K-ATP activator* Levosimendan and is currently pursuing approval for an indication in Group 2 Pulmonary Hypertension in the US and Canada with the HELP trial. The drug has been approved in over 60 countries with 35 published trials supporting its safety and efficacy and has over 1 million patient exposures.

In January 2018 Tenax announced a new indication for Levo and met with the FDA in April to confirm trial design. This indication has a target population of between 1.5 and 2.0 million patients in the US with no existing treatment therapy. TENX activated its first site for PH-HFpEF in November 2018 and reported topline in June 2020. Based on development for similar indications, the duration for Ph2 and Ph3 is expected to yield registrational data by 2023, followed by a 2024 launch of Levo in PH-HFpEF.

Levo has a ~20 year history of use in Europe with a substantial volume of literature supporting its safety and efficacy. Given the body of research supporting the use of Levo in pulmonary hypertension and its inotropic and lusitropic effects, there is sufficient support to justify a Ph2 trial in PH-HFpEF. Additionally, this is a materially sized market with no current therapy, which provides substantial pricing and penetration opportunity.

SUMMARY DATA

52-Week High	**$2.68**
52-Week Low	**$0.25**
One-Year Return (%)	**21.5**
Beta	**1.8**
Average Daily Volume (sh)	**1,170,039**
Shares Outstanding (mil)	**9.2**
Market Capitalization ($mil)	**$15.1**
Short Interest Ratio (days)	**0.06**
Institutional Ownership (%)	**21.8**
Insider Ownership (%)	**0.4**
Annual Cash Dividend	**$0.00**
Dividend Yield (%)	**0.00**
5-Yr. Historical Growth Rates	
Sales (%)	**N/A**
Earnings Per Share (%)	**N/A**
Dividend (%)	**N/A**
P/E using TTM EPS	**N/A**
P/E using 2019 Estimate	**N/A**
P/E using 2020 Estimate	**N/A**
Zacks Rank	**N/A**

Risk Level	**Above Average**
Type of Stock	**Small-Growth**
Industry	**Med-Biomed/Gene**

ZACKS ESTIMATES

Revenue
(in millions of $)

	Q1 (Mar)	Q2 (Jun)	Q3 (Sep)	Q4 (Dec)	Year (Dec)
2019	$0.0 A	$0.0 A	$0.0 A	$0.0 A	$0.0 A
2020	$0.0 A	$0.0 E	$0.0 E	$0.0 E	$0.0 E
2021					$0.0 E
2022					$0.0 E

	Q1 (Mar)	Q2 (Jun)	Q3 (Sep)	Q4 (Dec)	Year (Dec)
2019	-$0.33 A	-$0.28 A	-$0.33 A	-$0.41 A	-$1.35 A
2020	-$0.38 A	-$0.22 E	-$0.11 E	-$0.10 E	-$0.69 E
2021					-$1.27 E
2022					-$1.84 E

WHAT'S NEW

Phase II HELP Trial Topline Results

Tenax Therapeutics, Inc. (NASDAQ: TENX) announced topline results from its Phase II **H**emodynamic **E**valuation of **L**evosimendan in **P**atients with PH-HFpEF[1] (HELP) on June 2nd. Results were complemented by a conference call with company CEO Tony DiTonno, CFO Michael Jebsen and Scientific Advisory Board chair and expert in the field of PH and PH-HFpEF, Dr. Stuart Rich.

Exhibit I – HELP Trial Logo[2]

HELP study results were positive and statistically significant for key measures critical to a successful Phase III trial. Outcomes for the six minute walk test,[3] which has been used as a primary endpoint in other pulmonary hypertension trials, were 29 meters greater for the Levosimendan group compared to the placebo group. This measure had a p-value of 0.0329, better than the 0.05 threshold required for statistical significance.

Other important measures, such as pulmonary capillary wedge pressure (PCWP) at rest, with legs up and during exercise were all directionally correct; however, the primary endpoint of PCWP during exercise was not statistically significant. These additional measures helped to provide additional detail on the drugs mechanism and effect and are not expected to be assessed in Phase III. Below is a summary of the data as presented by Tenax. Additional analysis was performed to determine the statistical significance of the difference between the arms on all three measures using a mixed effect model that used treatments as factors and position as a random effect. It generated a p-value of 0.0475.

Exhibit II – Summary of HELP Trial Data[4]

PCWP Change From Baseline at Week 6				
mmHg	Placebo	Levosimendan	Difference	p-value
At Rest	-1.7	-5.1	-3.4	0.0894
Leg Up	-0.3	-6.0	-5.7	0.0184
Exercise	-0.5	-1.9	-1.4	0.6472

The trial's primary goal was to determine safety for extended use of Levosimendan, to further determine the mechanism of action of the drug and to help inform the design of the Phase III. Other secondary measures that were obtained in this effort include right atrial pressure (RAP) and mean pulmonary arterial pressure (mPAP)[5]. These measures examined the change in pressure compared to baseline at rest, with legs up and during exercise. Data were all directionally correct and with the exception of mPAP during exercise, were all statistically significant. A comparison of Levosimendan patients relative to baseline is provided in the subsequent exhibits.

[1] Pulmonary Hypertension in Heart Failure with Preserved Ejection Fraction (PH-HFpEF)
[2] Source: Tenax Corporate Presentation for HELP trial topline, June 2, 2020.
[3] The 6 Minute Walk Test is a sub-maximal exercise test used to assess aerobic capacity and endurance. The distance covered over a time of 6 minutes is used as the outcome by which to compare changes in performance capacity.
[4] Author's own work.
[5] The is the average of systolic and diastolic pressures.

Exhibit III – RAP vs. Baseline[6]

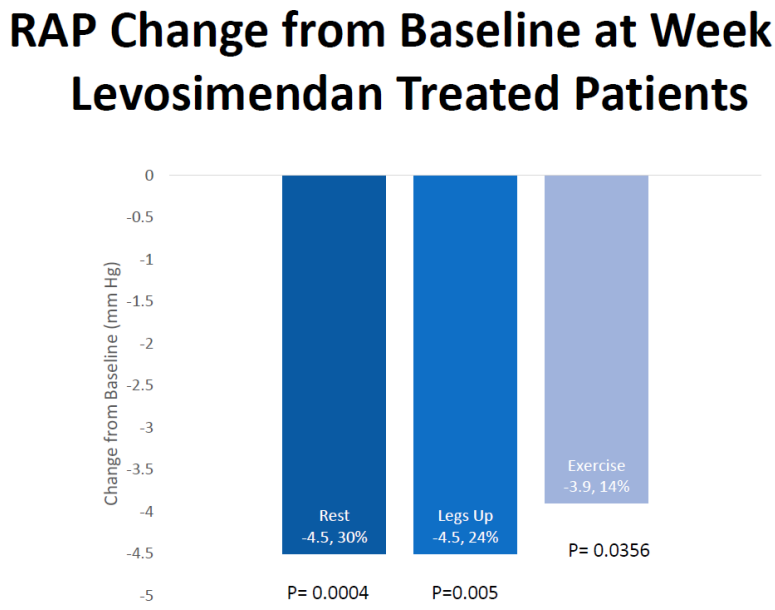
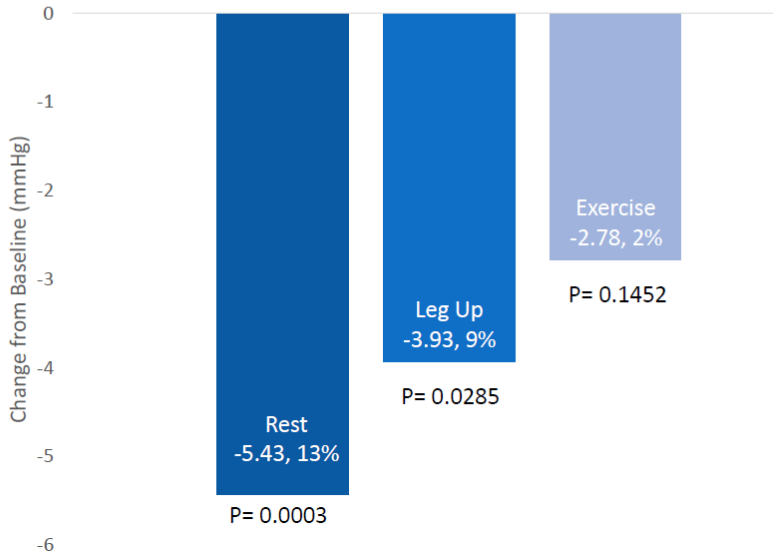


Exhibit IV – mPAP vs. Baseline[7]



Safety was a strong point in the trial. As we have explained in previous reports, Levosimendan has a long history of use in Europe and is well understood in treatment of acute decompensated heart failure. However, the drug has not been used as chronic therapy. Going into the trial, the FDA was concerned about treatment emergent adverse events related to hemodynamic issues and development of atrial and ventricular arrhythmias. These were not observed with the majority of adverse events being mild. Headache was the most common side effect, with three incidents observed in the Levo group compared to one event in the placebo group. Severe adverse events were

[6] Source: Tenax Corporate Presentation for HELP trial topline, June 2, 2020.
[7] Source: Tenax Corporate Presentation for HELP trial topline, June 2, 2020.

related to infections and infestations or device related infections which were attributed to failure to use leading methods for a peripherally inserted centeral catheter (PICC) line. Dr. Rich's practice is well versed in effective use of PICC lines and he believes this issue can be successfully addressed in Phase III.

Exhibit V – Treatment Emergent Adverse Events[8]

	Placebo n=18	Levosimendan n=18
Any Treatment Emergent AEs (TEAEs)	8 (44%)	13 (72%)
TEAEs by Severity		
Mild	5 (28%)	9 (50%)
Moderate	2 (11%)	2 (11%)
Severe	1 (6%)	2 (11%)
Any Drug-Related TEAEs	5 (28%)	9 (50%)
TEAEs of Special Interest †	0	0
Serious TEAEs	1 (6%)	3 (17%)

† hypotension, atrial fibrillation, other significant arrhythmia, resuscitated death stroke

The Phase II trial provided substantial support for advancing Levosimendan to the next stage that includes publication of results in a major cardiovascular journal, request for an end-of-Phase-II meeting with the FDA and preparation for a Phase III trial. We expect further announcements on these milestones in the coming months as the team continues to work through the data. While it is too early to determine Phase III trial design, based on commentary and precedent we think it is likely that the six minute walk test will be the primary endpoint for a Phase III. Our best estimate is that this trial may begin in 2021. A rough estimate of time, cost and size of the registrational trial range from 18 to 36 months, $30 to $50 million and 200 to 300 patients. While none of these estimates have been confirmed by the company, we believe they are reasonable based on precedent.

Background on the HELP Trial

In November 2018 Tenax announced the activation of the first clinical research site for the PH-HFpEF HELP trial at Stanford University School of Medicine. In March 2019, the first of what would eventually be 37[9] patients was enrolled in the trial. In early June 2020, topline results were presented to the investment community.

HELP Trial Design

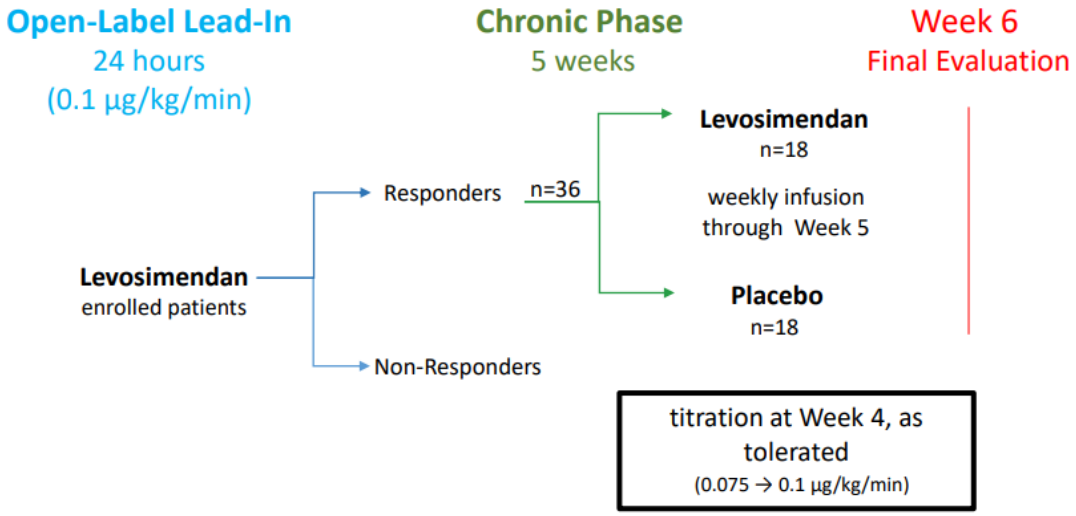
Required thresholds for inclusion in the trial called for patients with pulmonary arterial pressure (PAP) of at least 35, a pulmonary capillary wedge pressure (PCWP) of at least 20, a cardiac index (CI) of at most 2.2, a left ventricular ejection fraction (LVEF) of over 40 and NYHA Class IIb or III. The primary endpoints of the study were:

- Change from baseline PCWP with bicycle exercise (25 watts) at Week 6
- Detect a greater than or equal to 4.8 mmHg change in PCWP from baseline

Expected secondary endpoints included: change in resting PCWP under a variety of conditions, change in resting & stressed CI, change in pulmonary vascular resistance (PVR) at rest & under stress, global assessment at week six based on the Likert scale and length of exercise period and a physician's assessment of functional class and clinical events, including death and hospitalizations.

[8] Source: Tenax Corporate Presentation for HELP trial topline, June 2, 2020.
[9] The trial originally targeted 36 patients.

Exhibit VI – Phase II Study Design[10]

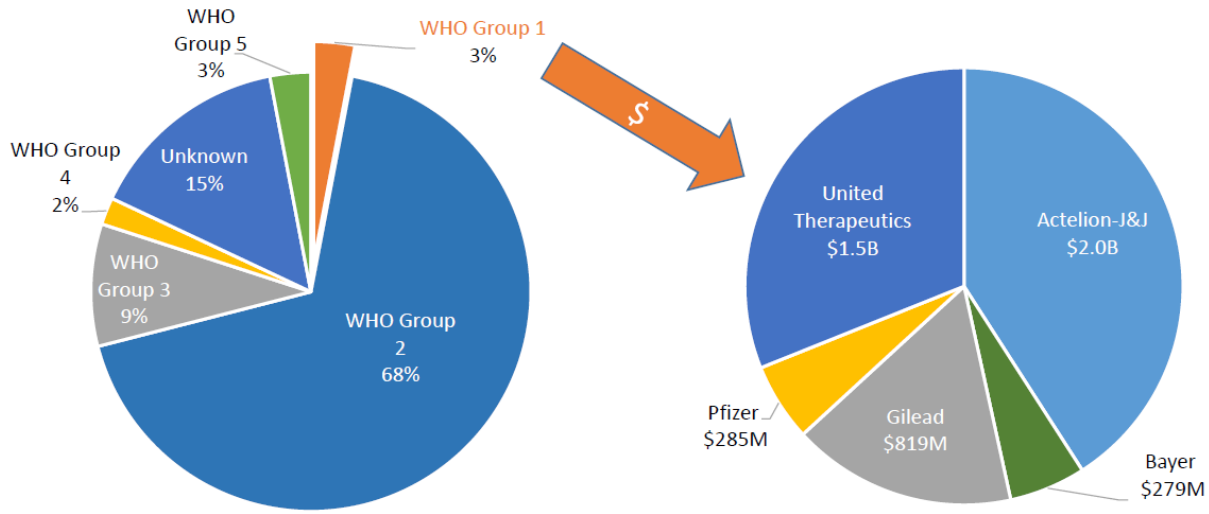


The HELP study used a 24-hour, once-per-week, at-home intravenous infusion regimen of between 0.075 to 0.100 µm/kg/min using an ambulatory infusion pump. The home-based approach allowed for a less frequent but longer session infusion regimen as compared with what would be practical in a hospital setting.

Update on PH-HFpEF Unmet Need

Tenax provided a review of its target market in its latest corporate presentation dated February 2020. The review reminded investors of the over two million PH-HFpEF patients in the United States who lack treatment and suffer from high mortality and a poor quality of life. There are five groups of pulmonary hypertension and only Group 1 has approved treatments. Group 1 comprises 3% of the total population of PH, while Group 2 makes up 68%. Group 2 is the population that Tenax is pursuing with its Levosimendan trials.

Exhibit VII – PH Prevalence and Market Size[11]



[10] Source: Tenax September 2019 Investor Presentation.
https://s3.amazonaws.com/cdn.irdirect.net/PIR/942/3392/TENX%20Investor%20Presentation%20Jan%202019.pdf
[11] Source:Tenax Corporate Presentation,February 2020. Pulmonary Hypertension Association Strange G, *et al* Heart. 2012;98(24):1805
11

Several other studies have been launched in PH-HFpEF using a variety of products including Bosentan, Macitentan and Riociguat. None of these trials demonstrated an effective treatment for the condition and further pursuit for these candidates in this indication was abandoned.

Exhibit VIII – Trials Conducted for PH-HFpEF[12]

Trial	BADDHY	MELODY	DILATE	HELP
Sponsor	Actelion/J&J	Actelion/J&J	Bayer	Tenax
Product	Bosentan	Macitentan	Riocigaut	Levosimendan
Approved Indication	PAH	PAH	PAH/CETPH	ADHF-Outside US
Patients (#)	20	63	39	36
Design	Randomized, Placebo- Controlled	Randomized, Placebo- Controlled	Randomized, Placebo- Controlled	Randomized, Placebo- Controlled
Study Duration	12 weeks	12 weeks	Single Dose	6 weeks
MOA	Pulmonary Vasodilator	Pulmonary Vasodilator	Pulmonary Vasodilator	Lusitrope Inotrope Vasodilator
Result	Ineffective, Stopped early	Ineffective, Fluid retention	Ineffective	Ongoing-TBD

Milestones

- Enroll First Patient – March 2019
- Full Enrollment – 1Q:20
- Last Patient, Last Visit – April 2020
- Topline data – June 2, 2020
- Presentation of data at conference – Fall 2020
- End-of-Phase II Meeting with FDA – 2H:20
- Launch Phase III – 2021

Summary

Now that the HELP trial has completed and topline data is public, management will be focused on publishing a paper and setting up a meeting with the FDA to plan a path forward to Phase III trials. Results from the HELP trial were positive and supportive of advancing to registrational studies. On the call, Dr. Rich reminded investors that the targeted patient population includes nearly 2 million patients. The population has a mortality rate of 24% at one year and 48% at five years after diagnosis. Hospitalizations are similarly stark with a rate of 28% at one year and 47% at five years after diagnosis. Based on the research and analysis included in our initiation, we believe PH-HFpEF patients will benefit from Levosimendan's mechanism of action and clinical trials can be pursued with a reasonable cost and time commitment. The indication is also in an area with no other approved treatments which should provide both regulatory and investor support to address Group 2 pulmonary hypertension. The market is sizeable and with a lack of other approaches, pricing should be strong and penetration high. Based on the quality of the data provided in the topline release, we increase our probability of success to 25% from 15% which raises our target price to $6.50 per share.

[12] Source: Tenax Corporate Presentation, February 2020.

PROJECTED FINANCIALS

Tenax Therapeutics, Inc. - Income Statement

Tenax Therapeutics, Inc.	2019 A	Q1 A	Q2 E	Q3 E	Q4 E	2020 E	2021 E	2022 E
Total Revenues	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**	**$0.0**
YOY Growth	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*
Research and development	$3.5	$1.3	$0.8	$0.3	$0.2	$2.6	$10.6	$11.7
General & administration	$5.1	$1.3	$1.2	$1.3	$1.3	$5.1	$5.3	$5.5
Income from operations	($8.6)	($2.7)	($2.0)	($1.6)	($1.5)	($7.8)	($15.9)	($17.1)
Operating Margin	-					-	-	-
Interest Income (expense)	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Other expense	($0.2)	($0.0)	$0.0	$0.0	$0.0	($0.0)	$0.0	$0.0
Pre-Tax Income	($8.4)	($2.7)	($2.0)	($1.6)	($1.5)	($7.8)	($15.9)	($17.1)
Accrual for Income Taxes	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$15.9	$34.3
Tax Rate	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*100%*	*200%*
Net Income	**($8.4)**	**($2.7)**	**($2.0)**	**($1.6)**	**($1.5)**	**($7.8)**	**($31.8)**	**($51.4)**
Net Margin	-	-	-	-	-	-	-	-
Reported EPS	**($1.35)**	**($0.38)**	**($0.22)**	**($0.11)**	**($0.10)**	**($0.69)**	**($1.27)**	**($1.84)**
YOY Growth	*-69%*	*15%*	*-19%*	*-66%*	*-75%*	*-49%*	*84%*	*44%*
Basic Shares Outstanding	6.20	6.97	9.00	14.40	14.60	11.24	25.00	28.00

Source: Company Filing // Zacks Investment Research, Inc. Estimates

HISTORICAL STOCK PRICE

Tenax Therapeutics, Inc. – Share Price Chart

DISCLOSURES

The following disclosures relate to relationships between Zacks Small-Cap Research ("Zacks SCR"), a division of Zacks Investment Research ("ZIR"), and the issuers covered by the Zacks SCR Analysts in the Small-Cap Universe.

ANALYST DISCLOSURES

I, John Vandermosten, hereby certify that the view expressed in this research report accurately reflect my personal views about the subject securities and issuers. I also certify that no part of my compensation was, is, or will be, directly or indirectly, related to the recommendations or views expressed in this research report. I believe the information used for the creation of this report has been obtained from sources I considered to be reliable, but I can neither guarantee nor represent the completeness or accuracy of the information herewith. Such information and the opinions expressed are subject to change without notice.

INVESTMENT BANKING AND FEES FOR SERVICES

Zacks SCR does not provide investment banking services nor has it received compensation for investment banking services from the issuers of the securities covered in this report or article.
Zacks SCR has received compensation from the issuer directly, from an investment manager, or from an investor relations consulting firm engaged by the issuer for providing non-investment banking services to this issuer and expects to receive additional compensation for such non-investment banking services provided to this issuer. The non-investment banking services provided to the issuer includes the preparation of this report, investor relations services, investment software, financial database analysis, organization of non-deal road shows, and attendance fees for conferences sponsored or co-sponsored by Zacks SCR. The fees for these services vary on a per-client basis and are subject to the number and types of services contracted. Fees typically range between ten thousand and fifty thousand dollars per annum. Details of fees paid by this issuer are available upon request.

POLICY DISCLOSURES

This report provides an objective valuation of the issuer today and expected valuations of the issuer at various future dates based on applying standard investment valuation methodologies to the revenue and EPS forecasts made by the SCR Analyst of the issuer's business.
SCR Analysts are restricted from holding or trading securities in the issuers that they cover. ZIR and Zacks SCR do not make a market in any security followed by SCR nor do they act as dealers in these securities. Each Zacks SCR Analyst has full discretion over the valuation of the issuer included in this report based on his or her own due diligence. SCR Analysts are paid based on the number of companies they cover. SCR Analyst compensation is not, was not, nor will be, directly or indirectly, related to the specific valuations or views expressed in any report or article.

ADDITIONAL INFORMATION

Additional information is available upon request. Zacks SCR reports and articles are based on data obtained from sources that it believes to be reliable, but are not guaranteed to be accurate nor do they purport to be complete. Because of individual financial or investment objectives and/or financial circumstances, this report or article should not be construed as advice designed to meet the particular investment needs of any investor. Investing involves risk. Any opinions expressed by Zacks SCR Analysts are subject to change without notice. Reports or articles or tweets are not to be construed as an offer or solicitation of an offer to buy or sell the securities herein mentioned.