Zacks Small-Cap Research

November 27, 2017
David Bautz, PhD
312-265-9471
dbautz@zacks.com

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

ContraFect Corp

(CFRX-NASDAQ)

CFRX: Additional Data on CF-301 Presented at ID Week 2017…

Based on our probability adjusted DCF model that takes into account potential future revenues from CF-301 in bacteremia and CF-404 in influenza, CFRX is valued at $7/share. This model is highly dependent upon continued clinical success of CF-301 and CF-404 and will be adjusted accordingly based upon future clinical results.

Current Price (11/27/17)	$1.00
Valuation	**$7.00**

OUTLOOK

ContraFect Corp. (CFRX) recently presented additional data on lead compound CF-301 at ID Week 2017, including new data on the synergy between CF-301 and conventional antibiotics as well as the activity of CF-301 against current *Staphyloccoccus aureus* strains from infected patients from the U.S. and Europe.

The Phase 2 study of CF-301 in patients with bacteremia caused by *S. aureus* continues with enrollment advancing as expected during the third quarter of 2017. We anticipate results in the fourth quarter of 2018.

SUMMARY DATA

52-Week High	**$2.55**
52-Week Low	**$0.88**
One-Year Return (%)	**-56.52**
Beta	**-0.84**
Average Daily Volume (sh)	**53,230**
Shares Outstanding (mil)	**74**
Market Capitalization ($mil)	**$74**
Short Interest Ratio (days)	**N/A**
Institutional Ownership (%)	**62**
Insider Ownership (%)	**9**
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 2016 Estimate	**N/A**
P/E using 2017 Estimate	**N/A**

Risk Level	**Above Avg.,**
Type of Stock	**Small-Blend**
Industry	**Med-Drugs**

ZACKS ESTIMATES

Revenue
(in millions of $)

	Q1 (Mar)	Q2 (Jun)	Q3 (Sep)	Q4 (Dec)	Year (Dec)
2016	0 A	0 A	0 A	0 A	0 A
2017	0 A	0 A	0 A	0 E	0 E
2018					0 E
2019					0 E

Earnings per Share
(EPS is operating earnings before non recurring items)

	Q1 (Mar)	Q2 (Jun)	Q3 (Sep)	Q4 (Dec)	Year (Dec)
2016	-$0.32 A	-$0.35 A	-$0.28 A	$0.01 A	-$0.85 A
2017	-$0.15 A	-$0.07 A	-$0.02 A	-$0.10 E	-$0.33 E
2018					-$0.41 E
2019					-$0.48 E

© Copyright 2017, Zacks Investment Research. All Rights Reserved.

WHAT'S NEW

Financial Update

On November 9, 2017, ContraFect Corp. (CFRX) announced financial results for the third quarter of 2017. As expected, the company did not report any revenues. The net loss for the quarter was $1.6 million, or $0.02 per share, and consisted of $4.9 million in R&D expenses and $1.8 million in G&A expenses. R&D expenses for the quarter were decreased by $1.0 million compared to the same time period in 2016 as a result of a decrease in spending on CF-404 partially offset by an increase in spending on CF-301 for the ongoing Phase 2 clinical trial. G&A expenses were decreased by $0.1 million compared to the same time period in 2016 as a result of a decrease in expenditures on the office and laboratory facilities due to the reduction in square footage effective Aug. 1, 2017. Other income was $5.2 million for the second quarter of 2017, compared with other expenses of $2.6 million for the third quarter of 2016. The increase relates to a non-cash gain resulting from the change in fair value of the company's warrant liabilities.

Total cash burn for the quarter was approximately $6.2 million, and the company had approximately $52.6 million in cash, cash equivalents, and marketable securities as of Sep. 30, 2017. In July 2017, the company completed an underwritten public offering of 32 million shares of common stock along with warrants to purchase 16 million shares of common stock at an exercise price of $1.55. The public offering price was $1.25 per share of common stock and accompanying warrant, which resulted in net proceeds to the company of approximately $36.9 million. We believe this will be sufficient to fund operations into the first half of 2019, thus the company should be fully funded through the end of the Phase 2 trial of CF-301, with results from that trial expected in the fourth quarter of 2018.

As of November 9, 2017, the company had approximately 73.7 million shares outstanding. In addition, there are approximately 6.0 million stock options and 36.3 million warrants for a fully diluted share count of approximately 116.0 million.

Business Update

CF-301

ContraFect's lead lysin product is CF-301. A lysin is a naturally occurring anti-bacterial hydrolytic enzyme that is produced by bacteriophages, which are virus' that infect and kill bacteria. Lysins are highly evolved enzymes that are able to target one of the five bonds in peptidoglycan (murein), the main component of bacterial cell walls. A typical lysin, such as CF-301, comprises two domains separated by a short linker region. The N-terminal domain catalyzes the hydrolysis of peptidoglycan whereas the C-terminal domain binds to the cell wall substrate, often a carbohydrate, which confers a great specificity and decreases the chance for bacterial resistance. Due to this, the use of lysins as antibacterial agents is designed to combat drug resistance to currently used antibiotics.

CF-301 will initially be targeted for the treatment of bacteremia, or infections of the bloodstream. Most studies estimate the incidence of *S. aureus* bacteremia (SAB) ranging from 20-50 cases/100,000 population (Klevens *et al*., 2007; Benfield *et al*., 2006; El Atrouni *et al*., 2009). Prior to the advent of antibiotics, the mortality rate from SAB was close to 80% (Mendell, 1939). The introduction of antibiotics, coupled with greater standards of care, has reduced the mortality rate, which appears to have stabilized at approximately 20% (Turnidge *et al*., 2009). SAB can frequently lead to infective endocarditis (IE), an infection of the endocardial surface of the heart (Fowler *et al*., 2005). The prevalence of IE is estimated to be anywhere from 11 to 50% of patients with SAB. Development of IE leads to an increased risk of embolic event and death (Miro *et al*., 2005).

Due to widespread resistance to penicillin, the current treatment of choice for *S. aureus* infections is semi-synthetic penicillin molecules. This resistance is due to the activity of the enzyme penicillinase, which cleaves the β-lactam ring of the penicillin molecule. Penicillinase-resistant β-lactam antibiotics include methicillin, oxacillin, and flucoxacillin. *S. aureus* strains that have acquired resistance to methicillin have an altered penicillin-binding protein (PBP2a) that has lower affinity for binding β-lactam antibiotics, thus rendering them ineffective. Strains that have acquired this resistance are referred to as methicillin-resistant *S. aureus* (MRSA). The current gold standard for treatment of MRSA is vancomycin. However, vancomycin is far from ideal due to poor tissue penetration, slow bactericidal activity, and a number of side effects (Gould, 2008). Additional antibiotics utilized include teicoplanin, tegecyline, linezolid, daptomycin, and televancin. Each of those medications has their own shortcomings, including the development of resistance, thus there exists a significant unmet medical need for newer therapies, particularly

those that are not susceptible to the development of resistance. Pre-clinical data shows that CF-301 synergizes with standard-of-care antibiotics, which results in a very high survival rate in mouse models of bacteremia.

Phase 2 Clinical Trial

The company has initiated a Phase 2 clinical trial of CF-301 in patients with bacteremia, including those with endocarditis, which is caused by both MRSA and methiciliin-sensitive strains of *Staphylococcus aureus*. The trial is an international, multicenter, randomized, double blind, placebo controlled study with a superiority comparison between CF-301 combined with the standard of care antibiotics compared to placebo with the standard of care antibiotics. The study will include 115 patients randomized 3:2 to receive a single dose of 0.25 mg/kg CF-301 administered via a two-hour infusion or placebo along with standard of care antibiotics. The primary endpoint of the study will be early clinical response. Safety, tolerability, and pharmacokinetics will also be examined along with additional exploratory clinical and health economic endpoints. We anticipate topline results in the fourth quarter of 2018. The company is not planning to perform an interim analysis.

New Data Presented on CF-301 at ID Week 2017

ContraFect recently presented two posters at the ID Week 2017 conference. The company presented additional data building upon previous reports showing CF-301's synergy with conventional antibiotics. In addition, surveillance data was presented showing the activity of CF-301 against current *S. aureus* strains isolated from patients in both the U.S. and Europe.

Poster #1: Lysin CF-301 Demonstrates In Vitro Synergy with Conventional Antibiotics against *Staphylococcus aureus*

This study was performed to determine the *in vitro* activity of CF-301 when combined with 12 antibiotics, including those considered to be the standard of care for *S. aureus* bacteremia (daptomycin, vancomycin, oxacillin, nafcillin, and cefazolin). Each combination was tested against 10 MSSA and 10 MRSA strains. The fractional inhibitory concentration index (FICI) was calculated for each combination. Synergy was defined as FICI ≤0.5, strongly additive was FICI >0.5 to <1, indifference was 1 to <2, and antagonism was ≥2. The following table shows that for the majority of antibiotics CF-301 was synergistic (green squares) or strongly additive (purple squares), with very few combinations being showing indifference. Particularly important is the fact that for the *S. aureus* bacteremia current standard of care antibiotics listed above the majority of combinations were synergistic.

Table 2. FICI values in caMHB-HSD

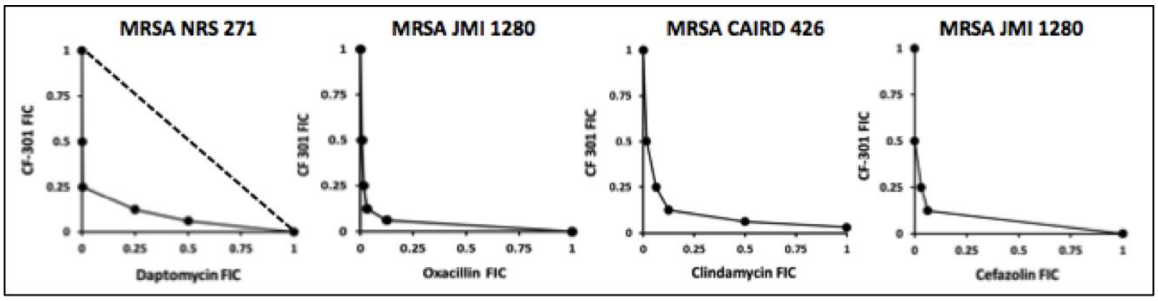
Resistance	Strain #	Antibiotics											
		DAP	VAN	OXA	LZD	TLV	NAF	CFZ	CLN	AZN	LEV	GM	SXT
MRSA	NRS 271	0.254	0.5	0.563	0.531	0.5	1.063	0.5	0.375	0.312	0.625	1.063	1.031
	NRS 100	0.5	0.5	0.5	0.5	0.5	0.313	0.5	0.375	0.312	1.031	0.375	0.75
	ATCC 43300	0.375	0.5	0.313	0.75	0.5	0.375	0.5	n.d.	n.d.	1.031	1.031	0.531
	HPV 107	0.375	0.5	0.375	0.75	1.031	0.375	0.37	0.5	0.375	0.5	1.031	0.75
	CAIRD 426	0.375	0.313	0.313	0.5	0.5	0.375	0.313	0.25	0.5	0.563	0.5	0.75
	JMI 227	0.5	0.281	0.375	0.625	0.5	0.375	0.75	0.375	0.5	1	0.508	1
	JMI 1280	0.5	0.5	0.156	0.5	0.75	0.5	0.188	n.d.	n.d.	1	1	0.75
	JMI 4789	0.375	0.5	0.375	0.5	0.5	0.375	0.5	0.375	0.375	0.75	0.508	0.504
	MW2	0.375	0.5	0.375	0.625	1.031	0.25	0.5	0.5	0.375	1	0.75	1.031
	ATCC 33591	0.5	0.5	0.5	0.375	0.504	0.5	0.25	n.d.	n.d.	1	1	0.508
MSSA	ATCC BAA-1718	0.5	0.75	0.5	0.5	0.5	0.375	0.75	0.5	0.375	1	1.031	0.508
	NRS 107	0.5	0.5	0.375	0.75	0.5	0.5	0.5	0.375	0.312	0.516	0.508	1.031
	NRS 143	0.5	0.5	0.5	0.503	0.5	0.5	0.75	0.5	0.312	1	1.031	1.031
	NRS 112	0.75	0.75	0.312	0.625	0.75	0.5	0.5	0.375	0.5	1.031	1.031	0.625
	NRS 161	0.5	0. 5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.625	0.75	0.75
	NRS 111	0.5	0.625	0.375	0.375	0.5	0.25	0.5	0.5	0.375	1	0.625	0.75
	ATCC 29213	0.375	0.5	0.312	0.625	0.75	0.312	0.5	0.375	0.5	0.75	1.031	0.516
	ATCC 49521	0.5	0.5	0.5	0.5	0.5	0.375	0.5	0.375	0.5	0.75	0.563	1.031
	JMI 2559	0.375	0.5	0.315	0.625	0.5	0.25	0.5	0.5	0.5	0.563	0.5	1.031
	JMI 3126	0.5	0.625	0.375	0.625	0.625	0.25	0.5	0.5	0.375	1.031	0.5	1.031

- DAP, VAN, OXA, LZD, TLV, NAF, CFZ, CLN and AZN were predominantly synergistic (>50% with FICI values ≤0.5); remainder were strongly additive; indifference was rare
- LEV, GM and SXT were predominantly strongly additive or indifferent

= synergy
= strongly additive
= indifferent

Source: Sauve *et al.*, 2017

An additional way of presenting the data was also shown through the following isobolograms for a subset of combinations tested. The curve on the left shows the theoretical curve for an additive effect (dashed line), with each graph showing a robust synergism when tested against the indicated strain.



Source: Sauve *et al*., 2017

In conclusion, CF-301 acts synergistically with the majority of antibiotics of different classes that are used to treat *S. aureus* bacteremia, and importantly there was no antagonism observed with any combination.

Poster #2: Activity of Antistaphylococcal Lysin CF-301 against Contemporary Staphylococcus aureus Clinical Isolates from the USA and Europe

In this study, 556 MSSA and MRSA isolates were collected from patient samples at different hospitals in the U.S., Greece, Hungary, Italy, Chile, and Columbia. Data was also presented for 149 clinical MSSA and MRSA isolates from U.S. hospital sources in 2011. Minimum inhibitory concentration (MIC) values were determined for CF-301 as well as antibiotics. The following table shows the distribution of isolates at the various MICs for CF-301 (which ranged from 0.125 µg/ml to 2 µg/ml). The data show a fairly even distribution of susceptibilities across the various geographies.

Organism (no. of isolates)[1]	Year[2]	No. of isolates inhibited by CF-301 MIC (µg/mL) of: 0.125	0.25	0.5	1	2	MIC_{50} (µg/mL)	MIC_{90} (µg/mL)
S. aureus								
NA (301)	2016-2017		7	199	95		0.5	1
EU (150)	2015		16	94	40		0.5	1
SA (105)	2017		3	51	46	5	0.5	1
NA (149)	*2011*	1	5	125	16	2	0.5	1
MSSA								
NA (145)	2016-2017		5	102	38		0.5	1
EU (76)	2015		1	46	29		0.5	1
SA (53)	2017		3	30	19	1	0.5	1
NA (74)	*2011*	1	4	63	6		0.5	1
MRSA								
NA (156)	2016-2017		2	97	57		0.5	1
EU (74)	2015		15	48	11		0.5	1
SA (52)	2017			21	27	4	1	1
NA (75)	*2011*		1	62	10	2	0.5	1

[1]Abbreviations: NA, North America; EU, Europe; and SA, South America.
[2]Surveillance study results from the analysis of clinical isolates from *2011* are included for comparison.

Source: Oh *et al*., 2017

The following table shows susceptibility profiles for CF-301 in comparison to different antibiotics when tested against various clinical MRSA isolates. As a single agent, CF-301 compares favorably to all tested antibiotics with similar, if not better, MIC values.

Table 6		Trimethoprim-Sulfamethoxazole		CF-301 MIC		Vancomycin MIC		Daptomycin MIC		Oxacillin MIC		Linezolid MIC		Cefazolin MIC		Clindamycin MIC	
Species	MIC (µg/ml)	MIC Frequency	Cumulative % Inhibited	MIC Frequency	Cumulative % Inhibited	MIC Frequency	Cumulative % Inhibited	MIC Frequency	Cumulative % Inhibited	MIC Frequency	Cumulative % Inhibited	MIC Frequency	Cumulative % Inhibited	MIC Frequency	Cumulative % Inhibited	MIC Frequency	Cumulative % Inhibited
MRSA (n=324)	0.015																
	0.03																
	0.06	228	71.5%														
	0.12	59	90.0%													38	11.9%
	0.25	9	92.8%	23	7.2%			6	1.9%					1	0.3%	176	67.1%
	0.5	2	93.4%	192	67.4%	89	27.9%	282	90.3%	2	0.6%			2	0.9%	4	68.3%
	1	2	94.0%	104	100.0%	220	96.9%	29	99.4%	2	1.3%	11	3.4%	11	4.4%	5	69.9%
	2	3	95.0%			3	97.8%	2	100.0%	1	1.6%	249	81.5%	46	18.8%		
	4									5	3.1%	49	96.9%	88	46.4%		
	8	2	95.6%							26	11.3%	1	97.2%	52	62.7%		
	16	4	96.9%							72	33.9%			14	67.1%		
	32	10	100.0%							80	58.9%	3	98.1%	18	72.7%	96	100.0%
	64									47	73.7%	6	100.0%	30	82.1%		
	128					7	100.0%			84	100.0%			57	100.0%		
	256																
	512																
	Totals	319	100.0%	319	100.0%	319	100.0%	319	100.0%	319	100.0%	319	100.0%	319	100.0%	319	100.0%

Source: Oh *et al*., 2017

The two posters presented by ContraFect at ID Week 2017 show that CF-301 has comparable efficacy to and works synergistically with standard of care antibiotics against clinical *S. aureus* isolates. These data lend additional support to the use of CF-301 as a treatment for *S. aureus* infections.

New Chief Operating Officer

On October 5, 2017, ContraFect announced that Ms. Lisa Ricciardi was appointed as Chief Operating Officer. She has served on ContraFect's Board of Directors since February 2017, and she will continue on in that role as well. Ms. Ricciardi has a wealth of experience from her time in various leadership positions at pharmaceutical, payer, and molecular diagnostic companies. She was previously Senior Vice President, Global Corporate & Business Development at Foundation Medicine and Senior Vice President, US and International Business Development at Medco Health Solutions, Inc. Prior to that, Ms. Ricciardi served in various senior management positions at Pfizer, where she was responsible for launching three drugs and growing franchises in cardiovascular disease, arthritis/rheumatology, and anti-infectives, including the launch of both Zithromax and Trovan.

Conclusion and Valuation

The data recently presented by ContraFect helps to further establish the *in vitro* efficacy of CF-301 and its ability to increase susceptibility of *S. aureus* strains (including MRSA strains) to antibiotic treatment. The company has initiated the Phase 2 study of CF-301 and we look forward to evaluating the results next year, which we anticipate in 4Q18. We have constructed a probability adjusted discounted cash flow model that takes into account potential future revenues from CF-301 and the company's influenza treatment CF-404. Our valuation currently stands at $7 per share, and we believe that all investors interested in the anti-infective space should consider taking a closer look at ContraFect.

PROJECTED INCOME STATEMENT

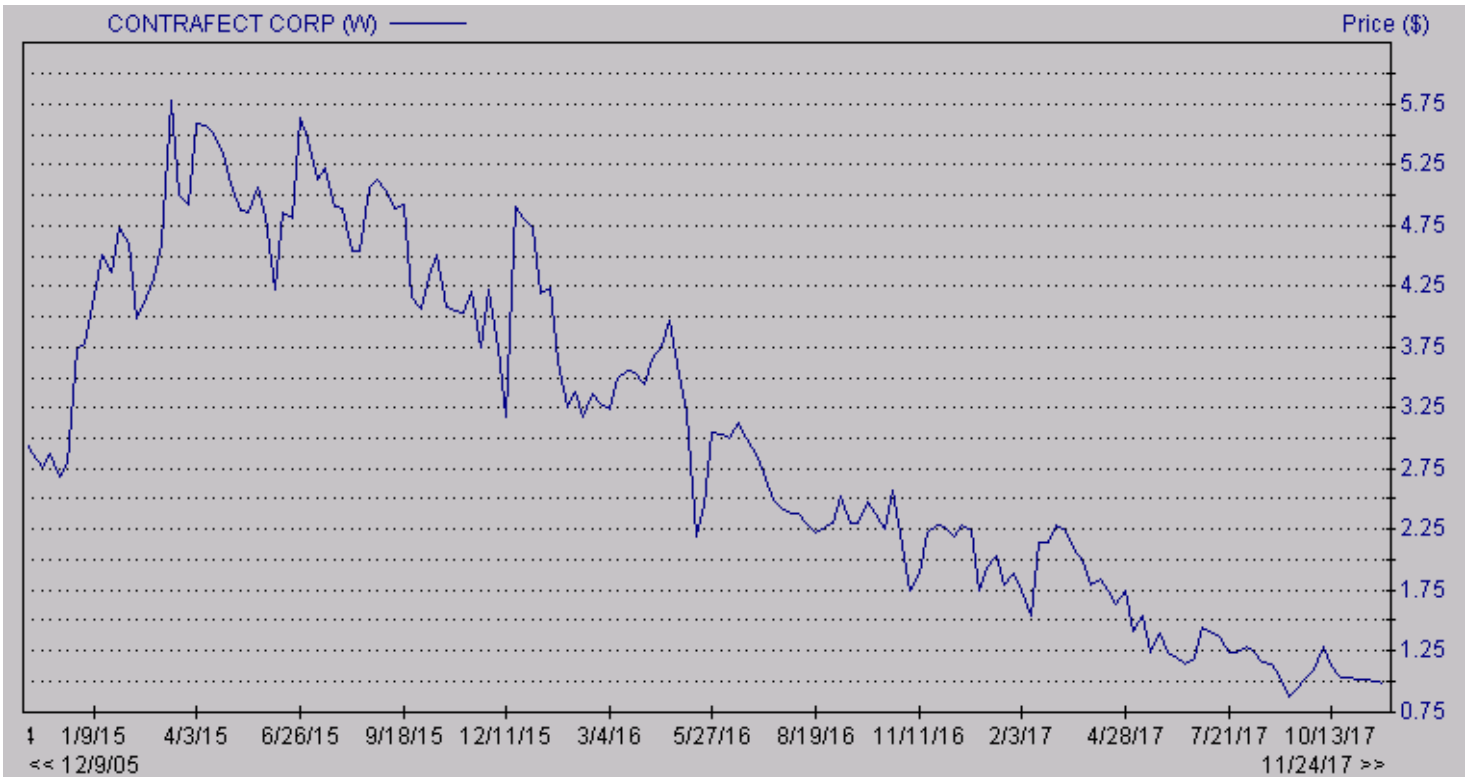
ContraFect Corp.
Income Statement

ContraFect Corp.	2016 A	Q1 A	Q2 A	Q3 A	Q4 E	2017 E	2018 E	2019 E
CF-301 (Bacteremia)	$0	$0	$0	$0	$0	$0	$0	$0
YOY Growth	-	-	-	-	-			
CF-404 (Flu)	$0	$0	$0	$0	$0	$0	$0	$0
YOY Growth	-	-	-	-	-			
Grants & Collaborative Revenue	$0	$0	$0	$0	$0	$0	$0	$0
YOY Growth	-	-	-	-	-			
Total Revenues	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
YOY Growth	-	-	-	-	-			
Cost of Sales	$0	$0	$0	$0	$0	$0	$0	$0
Product Gross Margin	-	-	-	-	-			
Research & Development	$22.1	$4.2	$3.8	$4.9	$5.1	$18.0	$20.0	$25.0
General & Administrative	$11.4	$2.1	$2.3	$1.8	$2.4	$8.7	$11.0	$13.0
Other Expenses	$0	$0	$0	$0	$0	$0	$0	$0
Operating Income	($33.5)	($6.3)	($6.1)	($6.7)	($7.5)	($26.7)	($31.0)	($38.0)
Operating Margin	-	-	-	-	-			
Non-Operating Expenses (Net)	$5.0	($0.0)	$3.2	$5.2	($0.1)	$8.3	($0.4)	($0.4)
Pre-Tax Income	($28.5)	($6.3)	($2.8)	($1.6)	($7.6)	($18.4)	($31.4)	($38.4)
Income Taxes Paid	$0	$0	$0	$0	$0	$0	$0	$0
Tax Rate	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*
Net Income	**($28.5)**	**($6.3)**	**($2.8)**	**($1.6)**	**($7.6)**	**($18.4)**	**($31.4)**	**($38.4)**
Net Margin	-	-	-	-	-			
Reported EPS	**($0.85)**	**($0.15)**	**($0.07)**	**($0.02)**	**($0.10)**	**($0.33)**	**($0.41)**	**($0.48)**
YOY Growth	-	-	-	-	-			
Basic Shares Outstanding	33.5	41.6	41.7	65.0	74.0	55.6	76.0	80.0

Source: Zacks Investment Research, Inc. *David Bautz, PhD*

© Copyright 2017, Zacks Investment Research. All Rights Reserved.

HISTORICAL STOCK PRICE



© Copyright 2017, Zacks Investment Research. All Rights Reserved.

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, David Bautz, PhD, 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 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.