Zacks Small-Cap Research
Sponsored – Impartial - Comprehensive

July 26, 2021
David Bautz, PhD
312-265-9471
dbautz@zacks.com

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

ContraFect Corp. (CFRX-NASDAQ)

CFRX: Presentations at ECCMID Highlight Advances in Lysin Platform…

Based on our updated probability adjusted DCF model that takes into account potential future revenues from CF-301 in bacteremia along with the lysin pipeline, our valuation of CFRX is $23/share. This model is highly dependent upon continued clinical success of CF-301 and additional lysin products and will be adjusted accordingly based upon future clinical results.

Current Price (07/26/21)	$3.95
Valuation	**$23.00**

OUTLOOK

On July 19, 2021, ContraFect Corp. (CFRX) announced multiple presentations, including two oral presentations, of data from its direct lytic agent (DLA) platform at the 31st European Congress of Clinical Microbiology & Infectious Diseases (ECCMID). The presentations included new *in vitro* data of exebacase showing it may have the potential to treat bone and joint infections along with new data showing that CF-370, the company's engineered lysin candidate, has potential against multiple Gram-negative pathogens. The company also announced the publication of two peer reviewed manuscripts highlighting the *in vivo* activity of CF-296, an engineered lysin with the potential to treat osteomyelitis and prosthetic joint infections caused by *Staphylococcus aureus*. ContraFect is continuing to enroll patients in the Phase 3 trial of exebacase and we anticipate the results of an interim futility analysis in 2H21.

SUMMARY DATA

52-Week High	**$6.68**
52-Week Low	**$3.58**
One-Year Return (%)	**-34.17**
Beta	**0.93**
Average Daily Volume (sh)	**202,116**
Shares Outstanding (mil)	**39**
Market Capitalization ($mil)	**$155**
Short Interest Ratio (days)	**N/A**
Institutional Ownership (%)	**66**
Insider Ownership (%)	**2**
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	**-4.4**
P/E using 2020 Estimate	**-3.6**

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)
2020	0 A	0 A	0 A	0 A	0 A
2021	0 A	0 E	0 E	0 E	0 E
2022					0 E
2023					0 E

Earnings per Share

	Q1 (Mar)	Q2 (Jun)	Q3 (Sep)	Q4 (Dec)	Year (Dec)
2020	-$0.49 A	-$0.88 A	$0.12 A	-$0.23 A	-$1.24 A
2021	-$0.18 A	-$0.22 E	-$0.24 E	-$0.26 E	-$0.91 E
2022					-$1.02 E
2023					-$1.00 E

© Copyright 2021, Zacks Investment Research. All Rights Reserved.

Business Update

Presentations at ECCMID Highlight New Data for DLA Agents

On July 19, 2021, ContraFect announced multiple data presentations at the 31st European Congress of Clinical Microbiology & Infectious Diseases (ECCMID). A copy of the presentations can be accessed on the company's website here. An overview of each the presentations is given below:

Synergistic anti-biofilm activity of exebacase and rifampin, vancomycin and daptomycin against *Staphylococcus epidermidis* strains responsible of bone and joint infections

This presentation included new data regarding the use of exebacase in treating bone and joint infections (BJI) with and without standard of care antibiotics. BJI and prosthetic joint infections (PJI) are increasing in prevalence as the population in Western countries continues to age. The economic burden of PJI was approximately $500 million in 2009 and that number is expected to continue to escalate (Kurtz *et al*., 2012). *Staphylococcus aureus* is the cause of anywhere from 30-70% of BJI, while *Staphylococcus epidermidis* is the most common pathogen in PJI.

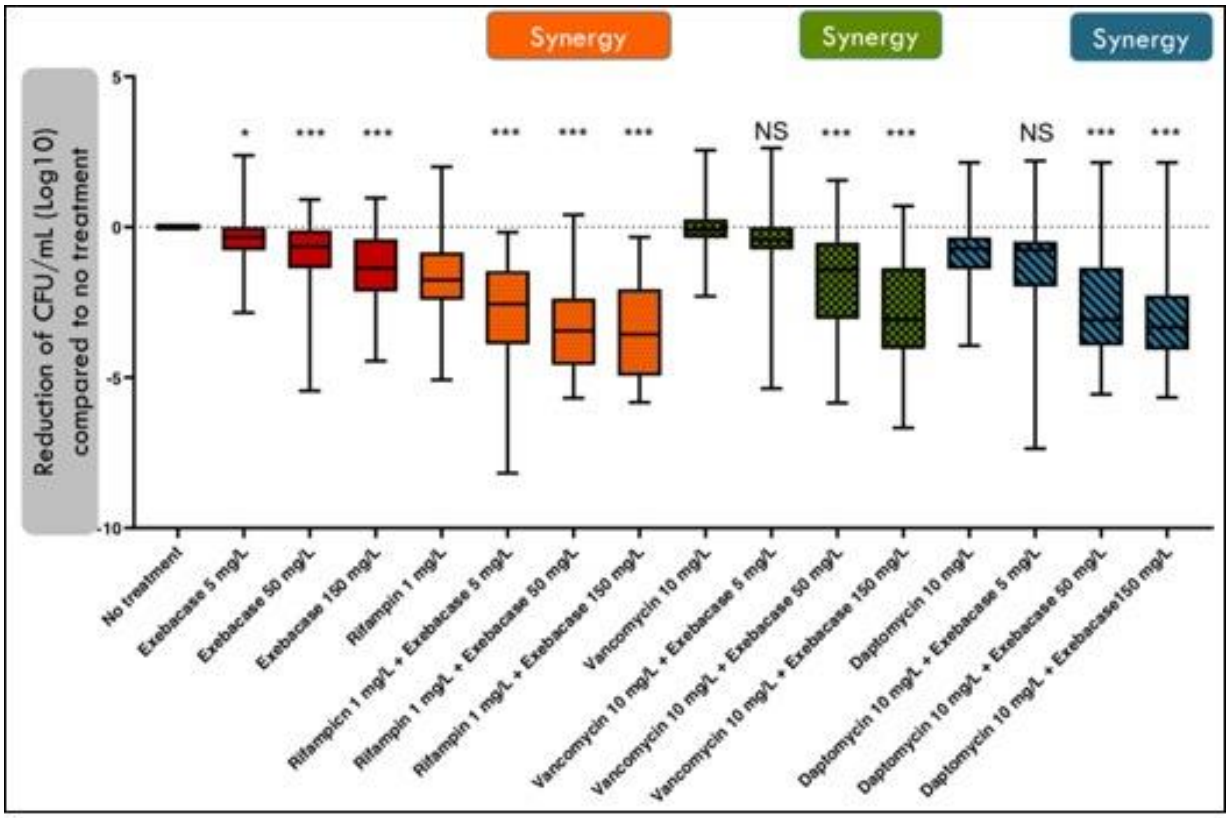
For this study, 19 clinical isolates were tested for their susceptibility to oxacillin, rifampin, vancomycin, daptomycin, and exebacase alone along with combination treatments of exebacase with the various antibiotics. The following chart shows that all clinical isolates were susceptible to exebacase, most were susceptible to vancomycin and daptomycin, and most were resistant to oxacillin. Susceptibility is shown through a low minimum inhibitory concentration (MIC) value, which is the lowest concentration of an antimicrobial that will inhibit visible growth of a microorganism.

			Antibiotic susceptibility				
Strains	Biofilm production	Location	Oxacillin MICs (mg/L)	Rifampin MICs (mg/L)	Vancomycin MICs (mg/L)	Daptomycin MICs (mg/L)	Exebacase MICs (mg/L)
12	None	Knee	S (<0,25)	S (<0,03)	S (1)	S (0,38)	0,125
22	None	Knee	S (<0,25)	S (<0,03)	S (1)	S (0,38)	1
4	Low	Knee	R (>2)	S (<0,03)	S (1)	S (0,5)	1
10	Low	Hip	R (>2)	S (<0,03)	S (1,5)	S (0,25)	0,25
19	Low	Hip	S (<0,25)	S (<0,03)	S (2)	S (0,5)	1
24	Low	Knee	R (>2)	S (<0,03)	S (1)	S (0,5)	1
33	Low	Shoulder	R (>2)	S (<0,03)	S (1)	S (0,5)	0,125
34	Low	Knee	R (>2)	R (>2)	S (1)	S (0,5)	0,25
3	Moderate	Knee	R (>2)	S (<0,03)	S (1)	S (0,75)	2
7	Moderate	Knee	R (>2)	S (<0,03)	S (2)	S (0,19)	1
11	Moderate	Knee	S (<0,25)	R (>2)	S (2)	S (0,5)	0,125
13	Moderate	Knee	R (>2)	R (>2)	S (1)	S (0,5)	0,125
20	Moderate	Knee	R (>2)	R (>2)	S (1)	S (0,5)	0,25
25	Moderate	Hip	R (>2)	S (<0,03)	S (2)	S (0,5)	1
32	Strong	Knee	S (<0,25)	S (<0,03)	S (1)	S (0,38)	0,5
39	Strong	Shoulder	S (<0,25)	S (<0,03)	S (2)	S (0,38)	4
41	Strong	Knee	S (<0,25)	S (<0,03)	S (2)	S (0,5)	0,125
51	Strong	Hip	S (<0,25)	S (<0,03)	S (2)	S (0,125)	1
52	Strong	Knee	R (>2)	R (>2)	S (1)	S (0,064)	2

S Susceptible, R Resistant. Biofilm production evaluated according to Stepanović *et al.* 2000.

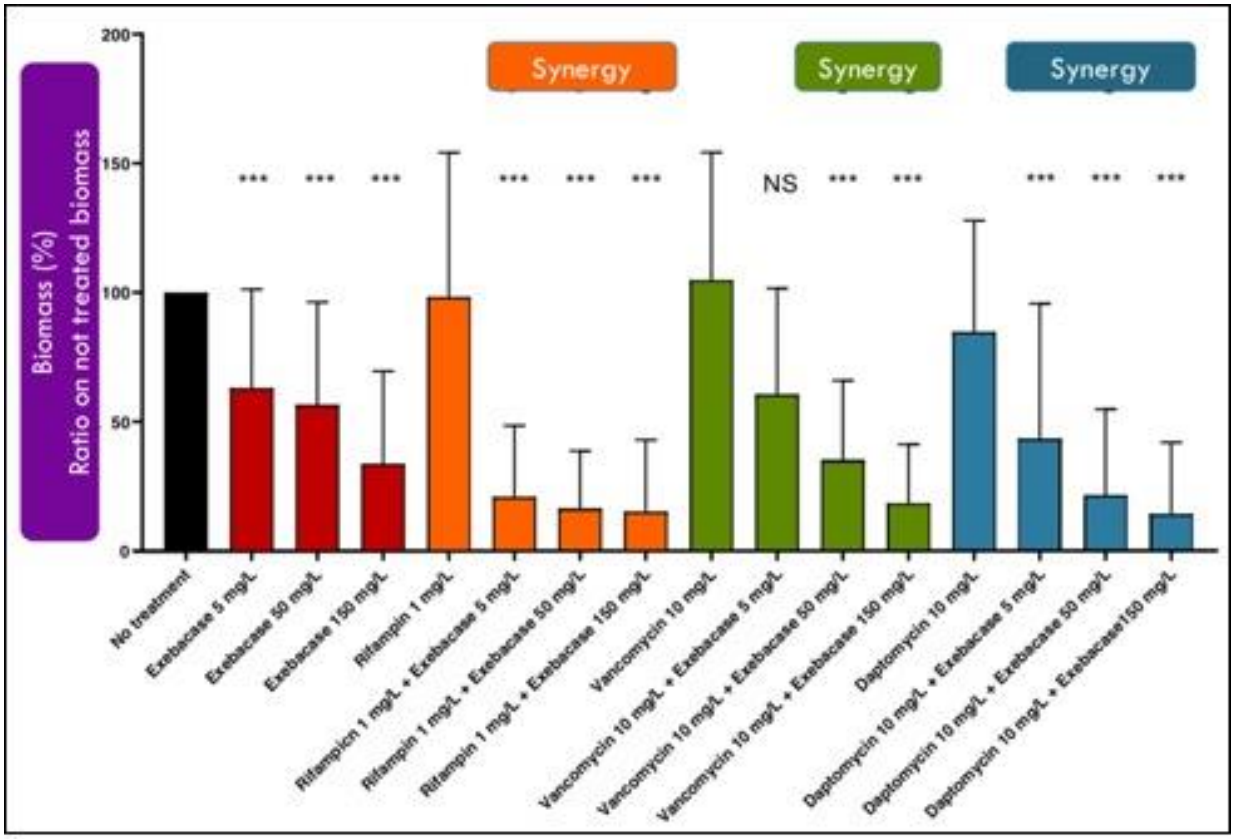
Source: Souche *et al.*, 2021

For these experiments, each isolate was allowed to grow a biofilm before treatment for 24 hours with exebacase alone, an antibiotic alone, or exebacase + an antibiotic with an outcome of the log reduction in bacterial growth and the % decrease in biomass. The following chart shows that compared to exebacase monotherapy there was a synergistic effect on bacterial growth when exebacase was combined with rifampin, vancomycin, or daptomycin with the maximum effect being a 3.5 log, 2.8 log, and 3.1 log decrease in bacterial growth, respectively.



Source: Souche *et al.*, 2021

Lastly, while the antibiotics alone did not appear to have much of an effect on biofilm formation, there was a synergistic effect between exebacase and the antibiotics tested with maximum decreases in biomass of 81-85%.

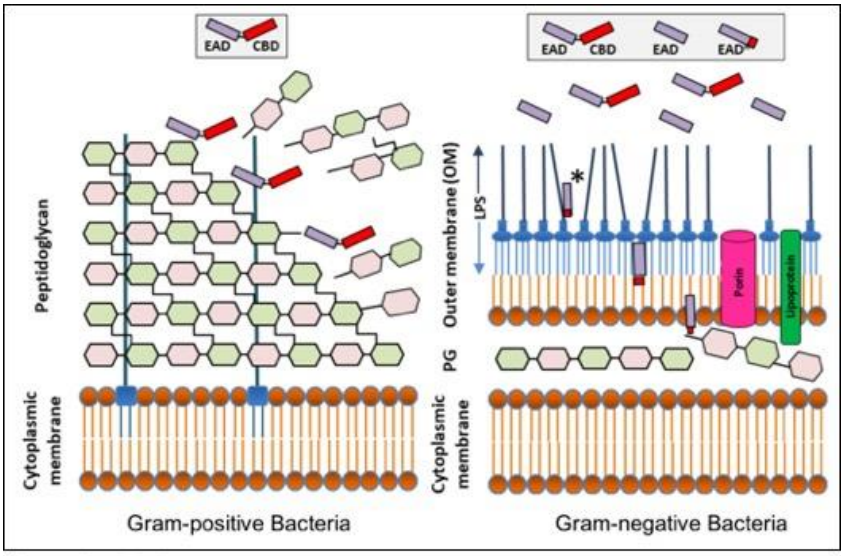


Source: Souche *et al.*, 2021

In summary, exebacase exhibits synergistic anti-microbial and anti-biofilm activity with a number of different antibiotic agents and could be useful as a therapy for BJI and PJI.

Lysin CF-370 exhibits potent bactericidal activity against clinical MDR and XDR *Pseudomonas aeruginosa* isolates including carbapenem- and/or colistin- resistant forms

CF-370 is the company's lead engineered lysin development candidate targeting Gram-negative bacterial species. The following figure shows how lysins are effective against Gram-positive bacteria due to their ability to easily interact with the peptidoglycan layer. However, Gram-negative bacteria have an outer membrane that acts as a barrier against most lysins, thus preventing them from reaching the peptidoglycan layer. While the majority of purified Gram-negative lysins have no antimicrobial activity, there are a select few that have some activity in low ionic strength buffers (indicated by the asterisk in the following figure on the right). It is these lysins that ContraFect used as lead compounds to modify in order to increase their anti-microbial activity, with CF-370 emerging as the lead candidate from this research.



Source: ContraFect Corp.

The following tables show that CF-370 has potent activity against *Pseudomonas aeruginosa* isolates, with the lower table showing that the compound is active against various clinical isolates that are resistant to a number of different antibiotics.

Organisms	n	0.25	0.5	1	2	MIC_{50}	MIC_{90}	Range
P. aeruginosa (all isolates)	124	3	20	67	34	1	2	0.25 - 2
P. aeruginosa (AR Panels)	67	2	12	33	20	1	2	0.25 - 2
P. aeruginosa (Weill-Cornell)	57	1	8	34	14	1	2	0.25 - 2

AR Bank	Resistance Mechanisms	CF-370	Amikacin	Azithro.	Cefepime	Ceftaz.	Cipro.	Colistin	Gent.	Imipenem	Mero.	Tobra.
230	aac(3)-Id, aadA2, cmlA1, dfrB5, OXA-4, OXA-50, PAO, tet(G), VIM-2	1	>64	4	>32	32	>8	1	>16	>64	128	>16
231	aac(6')-Ilc, KPC-5, OXA-2, OXA-50, PAO	2	8	>64	>32	>64	>8	1	>16	>64	256	>16
234	aadA6, OXA-50, PAO, strA, strB, tet(C)	1	4	<=2	4	<=2	4	1	>16	8	2	>16
230	aac(3)-Id, aadA2, cmlA1, dfrB5, OXA-4, OXA-50, PAO, tet(G), VIM-2	1	>64	4	>32	32	>8	1	>8	>16	128	>16
231	aac(6')-IIa, aadB, aph(3')-Ic, cmlA1, dfrB5, GES-1, OXA-10, OXA-50, strA, strB, tet(G), VIM-11	2	>64	32	>32	>64	>8	8	>16	>64	128	>16
246	aadB, NDM-1, OXA-10, OXA-50, PAO, rmtD2, tet(G), VEB-1	1	>64	>64	>32	>64	>8	1	>8	>16	32	>16
250	aadB, NDM-1, OXA-10, OXA-50, PAO, rmtD2, tet(G),VEB-1	1	>64	>64	>32	>64	>8	1	>8	>16	>256	>16

Source: Schuch, 2021

CF-370 exhibits synergism with a number of different antibiotic compounds. The following example shows that for *P. aeruginosa* isolate WC-452, which is resistant to both imipenem and meropenem, combination therapy of either

of those compounds and CF-370 results in a MIC value of 0.125, showing that CF-370 can resensitize that isolate to treatment with compounds to which it had developed resistance.

Resensitization observed with WC-452:

Antibiotic	FICI	Antibiotic MICs		CF-370 MICs	
		Alone	Combo	Alone	Combo
Imipenem	0.094	16 (R)	0.5 (S)	2	0.125
Meropenem	0.094	16 (R)	0.5 (S)	2	0.125

Source: Schuch, 2021

The company also recently presented data showing that CF-370 not only has activity against *P. aeruginosa*, but also against a number of other Gram-negative pathogens, including *Acinetobacter baumannii*, *Escherichia coli*, *Klebsiella pneumoniae*, and *Enterobacteriaceae cloacae*. The following table shows low MIC values for exebacase against most of the clinical isolates tested for each of the aforementioned species.

		MIC (µg/mL)												
Organism	n	0.016	0.032	0.064	0.125	0.25	0.5	1	2	4	8	MIC_{50}	MIC_{90}	Range
P. aeruginosa	124					3	20	67	34			1	2	0.25 - 2
A. baumannii	80					6	27	44	3			1	1	0.25 - 2
E. coli	44		1	2	4	16	16	5				0.25	1	0.032 - 1
K. pneumoniae	73				3	7	10	16	27	10		2	4	0.125 - 4
E. cloacae	37	1				4	7	8	12	4	1	1	4	0.016 - 8

Source: Schuch, 2021

These results are very exciting as they allude to the fact that CF-370 could potentially be used to battle a wide range of Gram-negative infections, not just those caused by *P. aeruginosa*.

CF-296 Publications Highlight its Anti-Staphylococcus Activity

On July 19, 2021, ContraFect announced two recent peer-reviewed publications regarding the *in vivo* activity of CF-296, an engineered lysin with potent bactericidal and anti-biofilm activity against *S. aureus*.

Activity of Lysin CF-296 Alone and in Addition to Daptomycin in a Rat Model of Experimental Methicillin-Resistant Staphylococcus aureus Osteomyelitis

This manuscript described *in vivo* data from a study of CF-296 in a rat model of acute methicillin-resistant *S. aureus* (MRSA) osteomyelitis (Karau *et al*., 2021). The results of the study showed that CF-296 has potent anti-staphylococcal activity both as a monotherapy and in combination with daptomycin along with being well tolerated.

Efficacy assessment of lysin CF-296 in addition to daptomycin or vancomycin against *Staphylococcus aureus* in the murine thigh infection model

This manuscript described results from a study of CF-296 in a murine *S. aureus* infection model (Asempa *et al*., 2021). The results showed that CF-296 exhibited efficacy both as a monotherapy and when used in combination with both daptomycin and vancomycin. In addition, treatment with both CF-296 and either daptomycin or vancomycin resulted in significantly enhanced antibacterial activity relative to either of the antibiotics alone.

Conclusion

ContraFect continues to accumulate a wealth of data regarding its direct lytic agent (DLA) platform. We are very intrigued by the data showing CF-370 has activity against a wide range of Gram-negative species and we will be very interested to see what direction the company takes that compound following additional analysis and preclinical testing. In the meantime, we are expecting the results of an interim futility analysis from the Phase 3 trial of exebacase sometime in the second half of 2021. With no changes to our model our valuation remains at $23 per share.

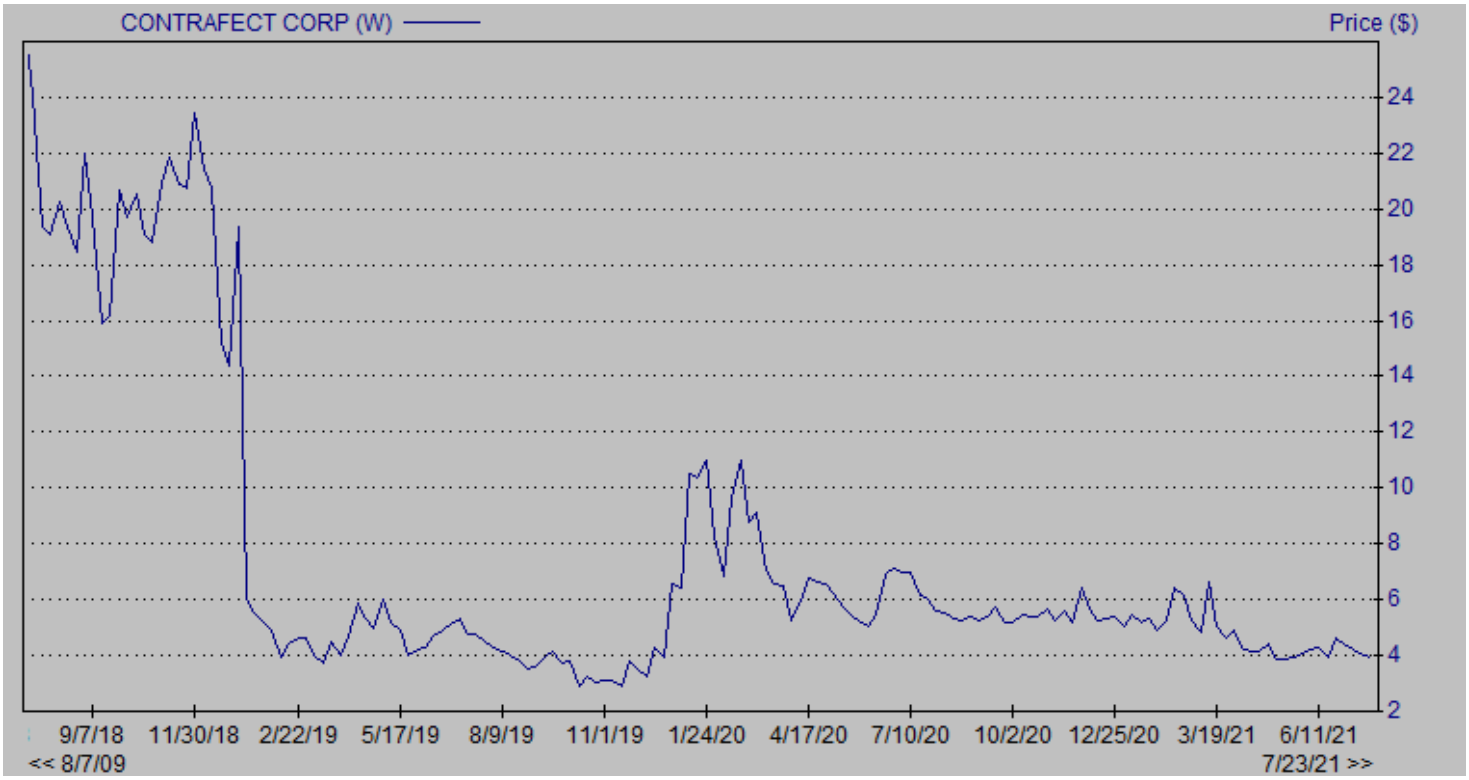
PROJECTED FINANCIALS

ContraFect Corp.	2020 A	Q1 A	Q2 E	Q3 E	Q4 E	2021 E	2022 E	2023 E
CF-301 (Bacteremia)	$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	$22.6	$8.0	$6.0	$6.5	$7.0	$27.5	$30.0	$35.0
General & Administrative	$11.6	$2.8	$3.3	$3.6	$3.9	$13.6	$15.0	$17.0
Other Expenses	$0	$0	$0	$0	$0	$0	$0	$0
Operating Income	($34.2)	($10.8)	($9.3)	($10.1)	($10.9)	($41.1)	($45.0)	($52.0)
Operating Margin		-	-	-	-			
Non-Operating Expenses (Net)	$6.1	$5.6	$0.5	$0.5	$0.5	$7.1	$2.0	$2.0
Pre-Tax Income	($28.2)	($5.2)	($8.8)	($9.6)	($10.4)	($34.0)	($43.0)	($50.0)
Income Taxes Paid	$0	$0	$0	$0	$0	$0	$0	$0
Tax Rate	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*
Net Income	**($28.2)**	**($5.2)**	**($8.8)**	**($9.6)**	**($10.4)**	**($34.0)**	**($43.0)**	**($50.0)**
Net Margin		-	-	-	-			
Reported EPS	**($1.24)**	**($0.18)**	**($0.22)**	**($0.24)**	**($0.26)**	**($0.91)**	**($1.02)**	**($1.00)**
YOY Growth		-	-	-	-			
Basic Shares Outstanding	22.8	29.0	39.5	40.0	40.5	37.2	42.0	50.0

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

© Copyright 2021, Zacks Investment Research. All Rights Reserved.

HISTORICAL STOCK PRICE



Source: Zacks Investment Research

© Copyright 2021, 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, 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.

CANADIAN COVERAGE

This research report is a product of Zacks SCR and prepared by a research analyst who is employed by or is a consultant to Zacks SCR. The research analyst preparing the research report is resident outside of Canada, and is not an associated person of any Canadian registered adviser and/or dealer. Therefore, the analyst is not subject to supervision by a Canadian registered adviser and/or dealer, and is not required to satisfy the regulatory licensing requirements of any Canadian provincial securities regulators, the Investment Industry Regulatory Organization of Canada and is not required to otherwise comply with Canadian rules or regulations.