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June 22, 2023
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ContraFect Corp. (CFRX-NASDAQ)

CFRX: CF-370 Effective in Rabbit Lung Infection Model Caused by Klebsiella Pneumoniae*…*

Based on our updated probability adjusted DCF model that takes into account potential future revenues from the lysin pipeline, our valuation of CFRX is $7.00/share. This model is highly dependent upon clinical success for exebacase and advancement of additional lysin products and will be adjusted accordingly based upon future clinical results.

Current Price (06/22/23)	$1.60
Valuation	**$7.00**

OUTLOOK

On June 20, 2023, ContraFect Corp. (CFRX) announced the presentation of data at ASM Microbe 2023 that included significant activity of its direct lytic agents against multiple drug-resistant Gram-negative pathogens, including *Pseudomonas aeruginosa*, *Klebsiella pneumoniae*, and *Burkholderia* spp. CF-370 was found to significantly reduce bacterial density in combination with amikacin or meropenem in rabbit lung infection models caused by *K. pneumoniae*; 18 lysins with activity against *Burkholderia* spp and *Yersinia pestis* have been selected for further preclinical development; a PK/PD study of CF-370 helped determine the appropriate PK target to drive clinical efficacy; and CF-296 was shown to be effective in treating osteomyelitis in a rat MRSA model.

SUMMARY DATA

52-Week High	**$280.80**
52-Week Low	**$0.90**
One-Year Return (%)	**-99.38**
Beta	**0.42**
Average Daily Volume (sh)	**1,840,974**
Shares Outstanding (mil)	**4**
Market Capitalization ($mil)	**$6**
Short Interest Ratio (days)	**N/A**
Institutional Ownership (%)	**14**
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	**N/A**
P/E using 2020 Estimate	**N/A**

Risk Level	**High**
Type of Stock	**Small-Value**
Industry	**Med-Drugs**

ZACKS ESTIMATES

Revenue
(in millions of $)

	Q1 (Mar)	Q2 (Jun)	Q3 (Sep)	Q4 (Dec)	Year (Dec)
2022	0 A	0 A	0 A	0 A	0 A
2023	0 A	0 E	0 E	0 E	0 E
2024					0 E
2025					0 E

Earnings per Share

	Q1 (Mar)	Q2 (Jun)	Q3 (Sep)	Q4 (Dec)	Year (Dec)
2022	-$41.00 A	-$36.79 A	-$34.71 A	-$16.12 A	-$124.97 A
2023	-$0.69 A	-$1.81 E	-$1.92 E	-$1.85 E	-$6.75 E
2024					-$3.75 E
2025					-$2.78 E

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Business Update

Multiple Presentations Highlight Lysin Activity Against Gram-Negative Pathogens

On June 20, 2023, ContraFect Corp. (CFRX) announced multiple presentations at ASM Microbe 2023 highlighting significant activity of multiple lysins against different Gram-negative pathogens.

Efficacy of lysin CF-370 in addition to amikacin or meropenem in a neutropenic rabbit lung infection model caused by *Klebsiella pneumoniae* (Pulse et al., 2023).
This study examined the efficacy of CF-370 alone and in combination with amikacin or meropenem in a neutropenic rabbit pneumonia model infected with either drug-sensitive or drug-resistant *Klebsiella pneumoniae*. Following inoculation with *K. pneumoniae*, CF-370 was administered IV as a single dose or every 24 hours, amikacin was delivered intravenously every 8 hours, and meropenem was dosed subcutaneously every 8 hours. Animals were euthanized after 91 hours. The following figures show the mean log reduction in bacterial load following treatment with amikacin (left figure) or meropenem (right figure). CF-370 enhanced the *in vivo* efficacy of both antibiotics against both drug-sensitive and drug-resistant *K. pneumonia* strains.

Figure 2. Mean Log CFU Reduction vs Vehicle Mean - *K. pneumoniae* ATCC43816

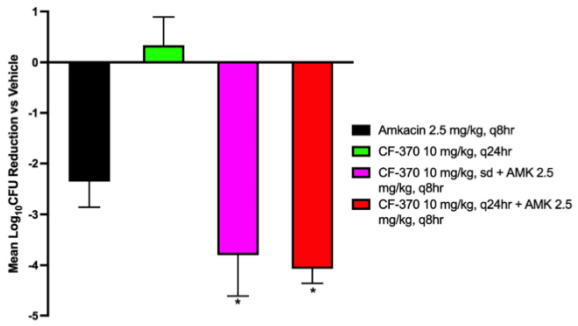
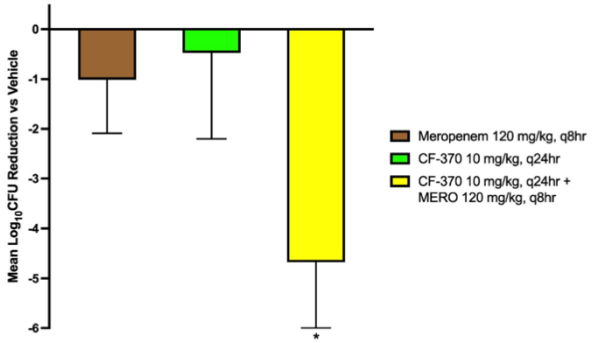


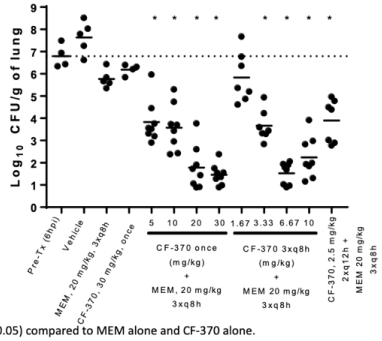
Figure 4. Mean Log CFU Reduction vs Vehicle Mean – *K. pneumoniae* AR-117



Source: Pulse *et al.*, 2023

PK-PD relationships and PK drivers of efficacy of the novel antibacterial lysin CF-370 in a rabbit pneumonia model caused by a carbapenem-resistant *Pseudomonas aeruginosa* (Lehoux et al., 2023).
This study examined the relationship between CF-370 and efficacy in a rabbit pneumonia model caused by carbapenem-resistant *Pseudomonas aeruginosa* PA20. Treatment began six hours after rabbits were inoculated with *P. aeruginosa* and continued for 24 hours. CF-370 was administered separately as a single dose, two doses spaced over 12 hours, or 3 doses spaced by 8 hours. Tissue samples were collected 24 hours after the last dose of meropenem. The following image shows the efficacy of CF-370 at different dosing fractions with and without meropenem. CF-370 in combination with meropenem results in a statistically significant reduction in lung infection when compared to meropenem alone or CF-370 alone, which agrees with previous results.

Table 3. Efficacy of CF-370+/-MEM in the rabbit lung infection model caused by PA20



*, statistically significant ($p<0.05$) compared to MEM alone and CF-370 alone.
Dotted line, bacterial density at the start of treatment (Pre-Tx)

Source: Lehoux *et al.*, 2023

In addition to efficacy, this study also examined the target systemic CF-370 exposure that would result in bacterial clearance in the lung. The following table shows that an AUC/MIC of 12 or greater results in a >3-log drop in bacterial load and could be predictive of efficacy in the clinic.

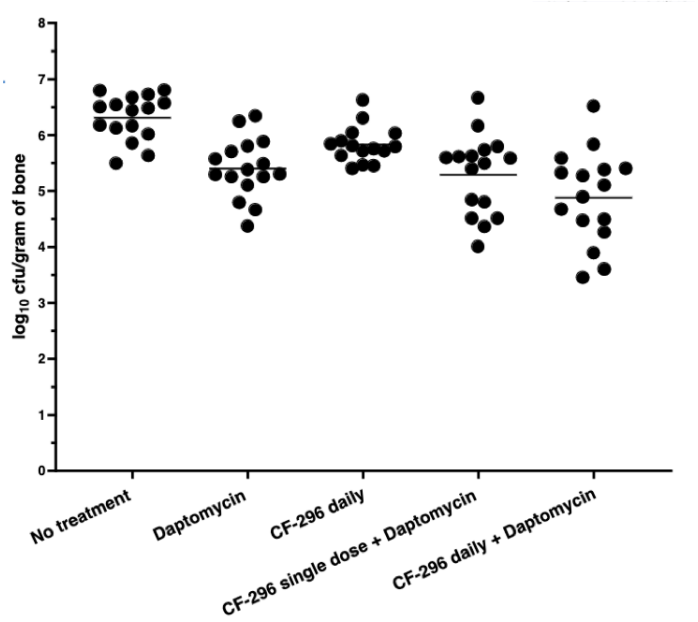
Table 4. Target systemic CF-370 exposure to achieve bacterial clearance in the lung

Target (Log_{10} kill)		
vs Start of treatment	vs MEM alone as SOCA	AUC/MIC
2-Log_{10}	1-Log_{10}	6.75
3-Log_{10}	2-Log_{10}	12.2
4-Log_{10}	3-Log_{10}	19.7

Source: Lehoux *et al*., 2023

Engineered lysins with potent in vitro activity against *Burkholderia* spp. and *Yersinia pestis* (Vila-Farres et al., 2023).
This study was undertaken to design lysins that have antimicrobial activity against *Yersinia pestis* (CDC Category A bioterrorism agent) and *Burkholderia species* (spp) (CDC Category B bioterrorism agent). Over 200 compounds were tested against *Y. pestis* and eight lead lysins were selected based on low minimum inhibitory concentration (MIC) values compared to non-engineered controls. Over 300 compounds were tested against five *Burkholderia* spp and 10 lead lysins were likewise selected. Three of the lead compounds were active against both *Y. pestis* and *Burkholderia* spp. Time-kill assays showed significant bactericidal activity (reductions >3-log_{10} CFU/mL) and there was no hemolysis of red blood cells observed with any of the lead compounds (highest concentration tested was 128 μg/mL). Additional analyses will be used to select three lead compounds for animal efficacy studies.

Efficacy of single and daily dose of lysin CF-296 in addition to daptomycin in a rat methicillin-resistant *Staphylococcus aureus* (MRSA) osteomyelitis model (Karau et al., 2023).
This study was designed to test the efficacy of a single vs daily doses of CF-296 (an engineered antistaphylococcal lysin) with and without daptomycin (DAP) in a rat MRSA osteomyelitis model. Osteomyelitis was established by injecting arachidonic acid and MRSA into the knee joint. After one week, rats were assigned to one of five groups: no treatment, DAP twice daily, CF-296 once daily, CF-296 once daily with DAP, CF-296 single dose on day 1 of treatment, CF-296 single dose on day 1 in addition to DAP. The following graph shows that all treatment groups had less MRSA recovered than untreated animals (P<0.0022). The greatest reduction in MRSA was seen with daily doses of CF-296 in addition to DAP, thus this treatment regimen may be a potential therapy for treating osteomyelitis.



Source: Karau *et al*., 2023

Conclusion

The results presented at ASM Microbe show how ContraFect's lysin platform continues to show promise against a wide-ranging group of pathogens, including the ability to generate lead development compounds with potent activity against two difficult to treat species, *Burkholderia* and *Yersinia*. We continue to anticipate an IND filing for CF-370 later this year and the continued enrollment of patients into the Phase 1b/2 trial of exebacase for the treatment of prosthetic joint infections. With no changes to our model our valuation remains at $7.00 per share.

PROJECTED FINANCIALS

ContraFect Corp.	2022 A	Q1 A	Q2 E	Q3 E	Q4 E	2023 E	2024 E	2025 E
Exebacase	$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	$44.7	$5.3	$4.4	$4.7	$5.0	$19.4	$20.0	$23.0
General & Administrative	$12.2	$3.6	$2.3	$2.4	$2.4	$10.7	$10.0	$10.4
Other Expenses	$8	$0	$0	$0	$0	$0	$0	$0
Operating Income	($64.6)	($8.9)	($6.7)	($7.1)	($7.4)	($30.1)	($30.0)	($33.4)
Operating Margin		-	-	-	-			
Non-Operating Expenses (Net)	($0.5)	$7.5	$0.0	$0.0	$0.0	$7.5	$0.0	$0.0
Pre-Tax Income	($65.2)	($1.4)	($6.7)	($7.1)	($7.4)	($22.6)	($30.0)	($33.4)
Income Taxes Paid	$0	$0	$0	$0	$0	$0	$0	$0
Tax Rate	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*
Net Income	**($65.2)**	**($1.4)**	**($6.7)**	**($7.1)**	**($7.4)**	**($22.6)**	**($30.0)**	**($33.4)**
Net Margin		-	-	-	-			
Reported EPS	**($124.97)**	**($0.69)**	**($1.81)**	**($1.92)**	**($1.85)**	**($6.75)**	**($3.75)**	**($2.78)**
YOY Growth		-	-	-	-			
Basic Shares Outstanding	0.5	2.0	3.7	3.7	4.0	3.3	8.0	12.0

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

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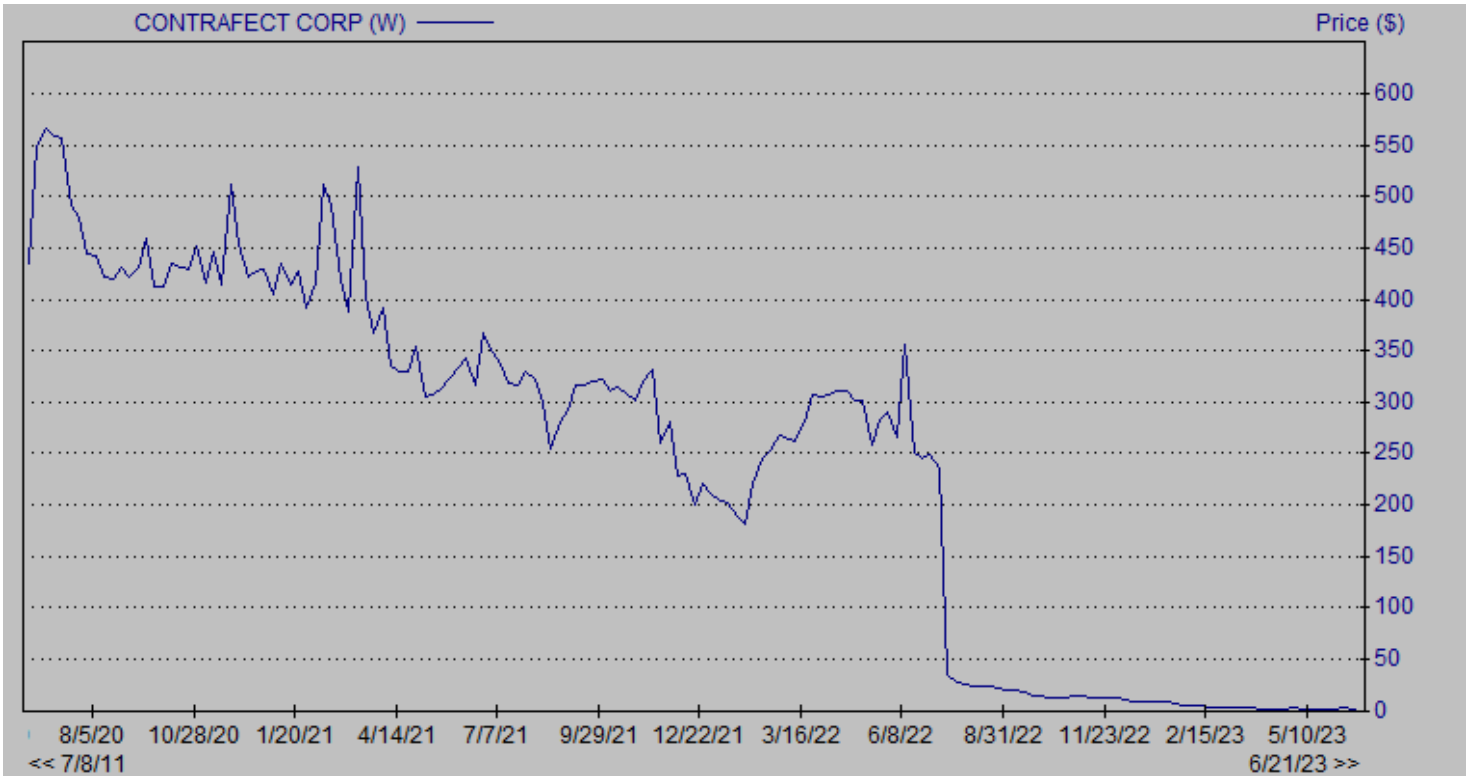

Source: Zacks Investment Research

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