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Diffusion Pharmaceuticals, Inc. (DFFN-NASDAQ)

DFFN: Preparing for Phase 2 Clinical Trial of TSC in Acute Stroke…

Based on our probability adjusted DCF model that takes into account potential future revenues from TSC in GBM, pancreatic cancer, and brain metastases, DFFN is valued at $3.00/share. This model is highly dependent upon the continued clinical success of TSC and will be adjusted accordingly based upon future clinical results.

Current Price (05/15/18)	$0.48
Valuation	**$3.00**

OUTLOOK

Diffusion Pharmaceuticals, Inc. (DFFN) is currently conducting the INTACT Phase 3 clinical trial of its lead candidate, trans sodium crocetinate (TSC), in 236 patients with newly diagnosed inoperable glioblastoma multiforme (GBM). The first patients were dosed in January 2018 and we anticipate an interim analysis being performed at the earlier of two years follow-up for all subjects or 198 events (deaths).

Diffusion is in the planning stages for a Phase 2 clinical trial of TSC in acute stroke. The Pre-Hospital Ambulance Stroke Trial – TSC (PHAST-T) will test the administration of TSC by Emergency Medical Technicians in ambulance-transported patients within two hours of onset of suspected stroke. If funding is available this trial could commence in late 2018.

SUMMARY DATA

52-Week High	**$3.20**
52-Week Low	**$0.48**
One-Year Return (%)	**-83.78**
Beta	**-0.92**
Average Daily Volume (sh)	**135,757**
Shares Outstanding (mil)	**51**
Market Capitalization ($mil)	**$24**
Short Interest Ratio (days)	**N/A**
Institutional Ownership (%)	**2**
Insider Ownership (%)	**16**
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 2018 Estimate	**N/A**
P/E using 2019 Estimate	**N/A**

Risk Level	**High**
Type of Stock	**Small-Value**
Industry	**Med-Biomed/Gene**

ZACKS ESTIMATES

Revenue
(In millions of $)

	Q1 (Mar)	Q2 (Jun)	Q3 (Sep)	Q4 (Dec)	Year (Dec)
2017	0 A	0 A	0 A	0 A	0 A
2018	0 A	0 E	0 E	0 E	0 E
2019					0 E
2020					0 E

Earnings per Share
(Diluted)

	Q1 (Mar)	Q2 (Jun)	Q3 (Sep)	Q4 (Dec)	Year (Dec)
2017	-$2.78 A	-$1.00 A	$0.20 A	$0.18 A	-$1.94 A
2018	-$0.27 A	-$0.06 E	-$0.07 E	-$0.07 E	-$0.45 E
2019					-$0.26 E
2020					-$0.28 E

WHAT'S NEW

Business Update

Planning Underway for Phase 2 Trial of TSC in Stroke Patients

In early 2018, Diffusion announced the acceptance of an abstract titled "PreHospital Acute Stroke Therapy with Trans Sodium Crocetinate (PHAST-TSC)" to be presented at the International Stroke Conference. The abstract discussed the design and rationale for a planned Phase 2 study of trans sodium crocetinate (TSC), a small molecule that improves diffusion of oxygen through the bloodstream in order to increase tissue oxygenation, in patients with acute ischemic (from a clot) or hemorrhagic (from a bleed) stroke. The Pre-Hospital Ambulance Stroke Trial – TSC (PHAST-T) will be a randomized, double blind, placebo controlled trial with an anticipated enrollment of 160 ambulance-transported patients treated within two hours of the onset of a suspected stroke. We anticipate the trial starting in late 2018, subject to funding, with results likely in 2019.

Preclinical models show that TSC could be an effective treatment for both ischemic and hemorrhagic stroke (Wang *et al*., 2014). In a rat model of ischemia-reperfusion, which involved two hours of ischemia followed by 22 hours of reperfusion, treatment with TSC one and a half hours after onset of ischemia led to a significant reduction in infarct volume of 32%. In a second model of ischemia-reperfusion, which involved two hours of reperfusion followed by an additional four hours of one vessel occlusion, treatment with TSC significantly reduced infarct volume by 34%. Lastly, in an intracerebral hemorrhage model in which TSC was administered three hours after collagenase injection, there was a significant reduction in hemispheric swelling and hemorrhage volume in animals treated with TSC. It is important that TSC be effective, or at least not detrimental, regardless of the type of stroke. Otherwise, its use would be contraindicated prior to the diagnosis of the type of stroke and by that time it may be too late to be effective.

There are approximately 800,000 strokes every year in the U.S., and they are responsible for the deaths of approximately 140,000 individuals (CDC). Strokes cost the U.S. healthcare system an estimated $34 billion every year (Benjamin *et al*., 2017). The only FDA approved treatment for acute ischemic stroke is tissue plasminogen activator (t-PA), although its use can aggravate outcomes in hemorrhagic stroke and increase hemorrhagic transformation in some ischemic strokes (Larrue *et al*., 2001). Worldwide sales of alteplase (recombinant t-PA) totaled $1.5 billion in 2017 and is expected to grow to $1.9 billion by 2022 (EvaluatePharma).

Phase 3 GBM Trial Enrolling Patients

In January 2018, Diffusion announced that the first patient has been dosed in the Phase 3 **IN**vestigating **T**sc **A**gainst **C**ancerous **T**umors (INTACT) clinical trial. The trial is anticipated to screen 300 patients with inoperable glioblastoma multiforme (GBM) and enroll 264 such that results from 236 patients will be available for analysis. Patients will be randomized 1:1 to receive TSC along with standard of care radiation and chemotherapy (temozolimide) or standard of care alone. The primary outcome of the study is overall survival at two years between the two groups. An interim analysis will take place at the earlier of a) two years follow-up for all subjects or b) 198 events (deaths). At 198 events the study will be 80% powered with an estimated overall survival time of 10 months for patients on standard of care and 14.9 months for patients treated with TSC in addition to standard of care.

The Phase 3 study is a follow up to a Phase 1/2 study of 59 GBM patients with newly diagnosed GBM (Gainer *et al*., 2016). In the Phase I portion of the trial, TSC was initially administered three times per week at half-dose to three patients prior to radiation. Six additional patients received full dose TSC for six weeks in combination with radiation. No dose-limiting toxicities were identified in the nine patients during the Phase I portion of the trial. Fifty additional patients were enrolled in the Phase II trial at full dose TSC in combination with TMZ and RT. Four weeks after completion of RT, all patients resumed TMZ for five days every four weeks, but no further TSC was administered.

The results of the study were presented in relation to a historical control group, which is from a 2005 study that showed the addition of TMZ to standard of care (surgery plus radiation) increased overall survival from 12.1 months to 14.6 months (Stupp *et al*., 2005). Diffusion reported that:

- TSC plus radiation and TMZ increased the patients' chance of survival at two years by 37% compared to the historical control group. The overall survival at two years was 37% in the TSC group compared to 27% in the historical control group.

- In the subgroup of patients considered inoperable (biopsy only), the chance of survival at two years for those who received TSC was increased by 380%.

- 71 percent of people treated with TSC were alive at one year compared to 61 percent of people in the historical control group.

- Of the 37 patients with tumors able to be monitored, 27 experienced tumor regression, with 11 (30%) patients having complete tumor regression.

- No serious negative safety findings attributed to TSC were observed in the TSC study and adverse events were consistent with those seen in previous trials of GBM featuring radiation and TMZ.

Since the study lacked a control arm it is difficult to draw definitive conclusions regarding the activity of TSC, however we have been unable to identify another publication that discusses tumor regression in GBM patients, thus it is difficult to put this data fully into context. Gainer *et al*. cite anecdotal evidence of a maximum regression of 25% typically seen with standard RT through discussions with those who administer RT to GBM patients, thus 30% of patients experiencing complete tumor regression appears to be unprecedented.

Patent Portfolio Expands

Diffusion recently announced the granting of U.S. Patent number 9,905,067 that expands the intellectual property protection of TSC and related compounds for their use in the treatment of various cancers (including brain and pancreatic cancer) in conjunction with radiation and chemotherapy. This is particularly relevant given the ongoing Phase 3 trial of TSC in GBM calls for its use in combination with standard of care radiation and chemotherapy.

Financial Update

On May 10, 2018, Diffusion announced financial results for the first quarter of 2018. Net loss for the first quarter of 2018 was $3.3 million compared to a net loss of $28.6 million in the first quarter of 2017. The large decrease in net loss was due to the classification of warrants issued with the private placement of Series A preferred stock in March 2017, which resulted in the recognition of $10.2 million in excess fair value of the warrants over the gross proceeds, a $2.9 million charge for placement agent commissions, and a $12.9 million non-cash expense for the change in fair value of the warrants. None of those charges occurred in 2018 as the warrants were reclassified into equity in November 2017.

R&D expenses for the first quarter of 2018 were $1.8 million, compared to $1.0 million during the first quarter of 2017. The increase was primarily due to increased costs associated with the Phase 3 GBM trial. G&A expenses in the first quarter of 2018 were $1.5 million, compared to $1.6 million for the first quarter of 2017. The decrease was due to decreased professional fees partially offset by increased salaries and wages.

As of March 31, 2018, the company had approximately $16.2 million in cash and cash equivalents. In January 2018, the company announced the pricing of a $12 million underwritten public offering of a total of 15 million shares of common stock together with 15 million warrants. The public offering price was $0.80 per share with the warrants having an exercise price of $0.80 and a five-year expiration date. In addition, since the company raised >$10 million, all outstanding Series A convertible shares were automatically converted to approximately 21 million shares of common stock, which included shares issued for accrued dividends and for the "make-whole" adjustment feature. As of May 5, 2018, the company had approximately 50.5 million common shares outstanding and when factoring in warrants and options a fully diluted share count of approximately 85.3 million.

Valuation

Diffusion's valuation is derived from a risk-adjusted discounted cash flow model that takes into account potential future revenues from the sale of TSC in GBM, pancreatic cancer, and brain metastases. For all indications we assume that the company will partner and receive 15% royalties on net sales.

For GBM, we model for a new drug application (NDA) to be filed in 2021, and approval in 2022. For pancreatic cancer, we model for the Phase 2 trial to initiate in 2019, an NDA filing in 2022, and approval in 2023. For brain metastases, we model for a Phase 2/3 trial to initiate in 2020, an NDA filing in 2023 and approval in 2024.

Combing the net present value for each of the company's development programs along with the company's current cash position and estimated additional capital necessary leads to a valuation of $3.00 per share. The stock is currently trading at a significant discount to this valuation and we believe that investors could use the current downturn to add to or establish a position.

PROJECTED FINANCIALS

Diffusion Pharmaceuticals, Inc.	2017 A	Q1 A	Q2 E	Q3 E	Q4 E	2018 E	2019 E	2020 E
TSC (GBM)	$0	$0	$0	$0	$0	$0	$0	$0
YOY Growth	-	-	-	-	-	-	-	-
TSC (Pancreatic Cancer)	$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	$5.1	$1.8	$1.8	$2.0	$2.2	$7.8	$9.0	$11.0
General & Administrative	$6.2	$1.5	$1.5	$1.5	$1.6	$6.1	$6.5	$7.0
Depreciation	$0.1	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0	$0.0
Operating Income	($11.3)	($3.4)	($3.3)	($3.5)	($3.8)	($14.0)	($15.5)	($18.0)
Operating Margin	-	-	-	-	-	-	-	-
Non-Operating Expenses (Net)	$8.9	($0.0)	$0.0	$0.0	$0.0	($0.0)	($0.2)	($0.2)
Pre-Tax Income	($2.4)	($3.4)	($3.3)	($3.5)	($3.8)	($14.0)	($15.7)	($18.2)
Income Taxes Paid	($1)	$0	$0	$0	$0	$0	$0	$0
Accretion of Series A preferred dividends	($1)	$8	$0	$0	$0	$8	$0	$0
Tax Rate	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*	*0%*
Net Income	**($2.6)**	**($11.6)**	**($3.3)**	**($3.5)**	**($3.8)**	**($22.2)**	**($15.7)**	**($18.2)**
Net Margin	-	-	-	-	-	-	-	-
Reported EPS	**($0.21)**	**($0.27)**	**($0.06)**	**($0.07)**	**($0.07)**	**($0.45)**	**($0.26)**	**($0.28)**
YOY Growth	-	-	-	-	-	-	-	-
Basic Shares Outstanding	12.4	42.1	51.0	52.0	53.0	49.5	60.0	65.0

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

HISTORICAL STOCK PRICE

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