GlycoMimetics

GLYC : NASDAQ : US$7.00

BUY

Target: US$12.00

John Newman, PhD - Canaccord Genuity Inc. (US)
JNewman@canaccordgenuity.com 212.389.8042
Kevin Dai, PharmD, BCOP - Canaccord Genuity Inc. (US)
kdai@canaccordgenuity.com 212-389-8043

COMPANY COMPANY STATISTICS:

Forecast Return:	71%
Shares Out (M):	18.4
Market Cap (M):	US$128.7
52-week Range:	US$6.02 - 18.99

EARNINGS SUMMARY:

FYE Dec		2013A	2014E	2015E
Revenue:		4.0	25.0	35.0
EPS:		(8.85)	(0.19)	(0.09)
Revenue:	Q1	3.8	0.0A	35.0
	Q2	0.1	15.0A	0.0
	Q3	0.1	0.0	0.0
	Q4	0.1	10.0	0.0
Total		4.0	25.0	35.0
EPS:	Q1	0.49	(0.30)A	1.51
	Q2	(3.70)	0.42A	(0.45)
	Q3	(3.68)	(0.41)	(0.48)
	Q4	(1.96)	0.07	(0.49)
Total		(8.85)	(0.19)	(0.09)

SHARE PRICE PERFORMANCE:

Source: Interactive Data Corporation

COMPANY DESCRIPTION:
GlycoMimetics is a clinical-stage biotech company focused on novel glycomimetic (carbohydrate imitating) drugs. The disease-related functions of carbohydrates can include roles in inflammation, cancer cell survival/behavior and infection. GlycoMimetics' GMI-1070 is a very promising therapy for sickle cell disease.

All amounts in US$ unless otherwise noted.

Life Sciences -- Biotechnology

RIVIPANSEL PENETRATES SICKLE CELL DISEASE; RE-ESTABLISHING COVERAGE AT BUY WITH $12 PT

Investment highlights

Rivipansel potential for $854M peak sales in sickle cell disease

We estimate ~$854M in US peak sales by 2024 for Rivipansel, a Pfizer-partnered selectin inhibitor for the treatment of vaso-occlusive crisis (VOC) in sickle cell disease (SCD). Despite orphan designation, we believe the market share for GMI-10 70 may well be >100,000 patients/year by 2019, which is not including the potential to penetrate the outpatient population if the drug shows favorable results in its SQ formulation.

Phase 2 data interesting; await Pfizer initiation of Phase 3 trial

Phase 2 data with Rivipansel showed dramatic decrease in time to VOC resolution, time to discharge, and statistically significant reduction in 24-hour and cumulative opioid use compared to placebo, a positive heading into Phase 3 trials. However, manufacturing development issues from Pfizer, the company responsible for ongoing clinical development of Rivipansel, may push expected launch date to 2018. We await further guidance from Pfizer on commencement of Phase 3 trials.

GMI-1271 may penetrate ~$300M market in AML

GMI-1271, an E-selectin inhibitor to AML cells, showed favorable results when used in combination with first-line AML therapies, with expected data to be presented in mid-2015. Additionally, because the compound is wholly owned by GlycoMimetics, positive data could move the stock substantially higher.

Re-establish coverage with $12 price target, potential upside to $29

We are re-establishing coverage of GLYC with a $12 target based on an NPV analysis. We assume a ~40% probability of approval based on current data, with potential upside to ~$29 if Rivipansel is approved by FDA. We currently do not include GMI-1271 in our valuation.

INVESTMENT THESIS

We are re-establishing coverage of GlycoMimetics (GLYC) with a BUY rating and a $12 price target. We believe the company's main drug, Rivipansel (GMI-1070), shows promise for the treatment of vaso-occlusive crisis (VOC) in patients with sickle cell disease (SCD). To date, no effective therapy is available for patients who suffer from this acute pain attack, and oftentimes hospitalization is required for hydration, oxygen, and pain control. The CDC estimates that >100,000 patients will be hospitalized each year for SCD, with an average duration of ~4 days. Market share for Rivipansel may increase dramatically if Pfizer studies the drug as a subcutaneous formulation, expanding the product to outpatient and home use. Therefore, we think SCD represents a large market opportunity, given its large, yet orphan prevalence, with the potential for Rivipansel to have peak sales of ~$854M by 2024.

We believe the mechanism of action for Rivipansel is well characterized to have a strong impact on decreasing the inflammatory component of SCD crisis. Selectin binding of immune cells, especially white blood cells, to the endothelium contributes to both the onset and prolongation of SCD VOC attacks. This binding and activation of white blood cells activates neutrophils and monocytes, leading to production of microparticles from neutrophils and promotion of thrombus formation. This cascade effect increases systemic inflammation and blood viscosity, preventing blood flow through increased vascular occlusion. Patients with this disease experience acute onset of pain, hypoxia, fever, and organ damage. Rivipansel is a pan-selectin inhibitor that prevents the binding of immune cells, decreasing the multiple pathologies involved in SCD crisis.

Phase 2 data with Rivipansel is interesting, reporting strong clinical benefit in patients with VOC while maintaining a benign safety profile. This n=76 patient Phase 2 clinical trial was able to reduce length of VOC crisis by a mean of 41 hours and median of 63 hours. Additionally, median time to discharge from hospital was also reduced by a mean of 55 hours and median of 84 hours. These measures did not reach statistical significance due to higher-than-expected variability in the data. However, the cumulative amount of opioid analgesics was reduced by a statistically significant 83%. There was also a statistical reduction of 24-hour opioid requirement between Rivipansel and placebo. We believe these results reflect favorably going into pivotal Phase 3 trials, though recent manufacturing development issues from Pfizer may delay initiation of Phase 3 trials and subcutaneous formulation until 2015.

Finally, we believe the company's wholly owned E-selectin inhibitor has the potential to penetrate ~$300M AML market, especially since the drug is studied for front-line use in combination with standard chemotherapy. Additionally, the company also has wholly owned preclinical E-selectin/CXCR antagonist programs in hematologic cancers. While these programs are preclinical and are not included in our valuation model, we think they could drive market share if results are positive.

COMPANY OVERVIEW

GlycoMimetics is a clinical-stage biotechnology company focused on the discovery and development of novel glycomimetic (carbohydrate imitating) drugs to address unmet medical needs resulting from diseases in which carbohydrate biology plays a key role. Since its inception in 2003, GlycoMimetics has the proprietary expertise in carbohydrate chemistry and knowledge of the structure and function of carbohydrate biology to develop a pipeline of proprietary compounds that specifically target the disease-related functions of carbohydrates. These can include roles in inflammation, cancer cell survival/behavior and infection. We believe this represents an innovative approach to drug discovery to treat a wide range of diseases.

CATALYSTS

We await further update from Pfizer, the company responsible for ongoing clinical development of Rivipansel, to begin Phase 3 clinical trials initially slated for YE14. Pfizer recently announced that there will be delays on the initiation of Phase 3 trials due to manufacturing issues impacting formulated drug supply.

Additionally, we expect interim results from the Phase 1 portion of GMI-1271 in AML by mid-2015. Given the interesting preclinical data reported with this compound, we believe positive clinical and safety results can be a catalyst for positive market gains, especially since this product is wholly owned by GlycoMimetics.

Figure 1: GlycoMimetics catalyst

Event	Timing	Description	Effect	Importance	Notes
GMI-1070	?	Initiation of Phase 3 trials/SQ formulation	↑	Critical	On hold due to manufacturing issues per Pfizer
GMI-1271	Mid-2015	Interim data from phase 1 portion of phase 1/2 study in AML	↑	Moderate	Expect biomarker study and clinical results as adjunct to standard chemotherapy

Source:

VALUATION

We are establishing a $12 price target based on a probability-adjusted net present value analysis for Rivipansel. We project peak sales of ~$854M for Rivipansel in the US and $949M ex-US by 2024, assuming the drug will launch in the US by 2018 and ex-US by 2019. Importantly, GlycoMimetics will receive a low to mid-teens royalty from Pfizer on worldwide sales, which we model at ~15%. Our valuation is probability adjusted by 40% for the company's main compound.

We project peak sales for Rivipansel based on a detailed model of the US and ex-US sickle cell market, including epidemiology studies and patient registry through the CDC. After assuming a monthly cost of therapy to arrive at our revenue forecast, we assume a 15% royalty for both US and ex-US sales from Pfizer. We also subtract another 10% of gross profit for the royalty payment that GlycoMimetics must pay the University of Basel in their research agreement. After assuming a 37% tax rate and arriving at our net income, we calculate the net present value (NPV) at the launch date using a discount rate of ~10% and then discount back to the present. Our valuation assumes $5 for GMI-1070 in US and $7 ex-US, with total equity value of $12. Our effective discount rate, which takes into account our 40% probability adjustment, is ~32%.

Figure 2: GLYC valuation

Product	Peak Sales ($MM)	Year	NPV at launch	Estimated launch	Time to launch	Probability Adjustment	Current Value ($MM)	Value / Share
GMI-1070								
US	$854	2024	$344	1/1/2018	3.0	40%	$104	$5
Ex-US	$949	2024	$488	1/1/2019	4.0	40%	$127	$7
Total Product Value							**$232**	**$12**
Total Equity Value							**$232**	**$12**
Shares Outstanding (MM)							19	

Risk-Free Rate	3.0%
Beta	1.8
Risk Premium	4%
Discount Rate	10%

Source: Canaccord Genuity estimates

RIVIPANSEL PEAK AT $854M US

We believe Rivipansel could reach US peak sales of ~$854M by 2024, assuming FDA approval in early 2018. Because there is currently no treatment for VOC, we assume rapid uptake of the drug if approved.

We model $854M for US peak sales based on a detailed revenue build tied to data from CDC, epidemiology studies, and patient registries. CDC estimates ~100,000 patients currently suffering from SCD in the US in 2009, though we believe this number to be conservative given the fact that the incidence of SCD is high in the indigenous and poverty-stricken patient population. With a ~3.5% increase in incidence rate of SCD diagnosis, we assume ~180,000 patients to be diagnosed with SCD by 2024. We next separate the market by age group since VOC attacks occur ~3 times per year for patients under 18 and ~6 times per year for patients between 18 and 30 years old (Ballas et al. 2009). Based on CDC and epidemiology studies, we assume ~23% (~40,000 patients) of SCD patients are <18 years old and ~30% (~58,000 patients) are between 18 and 30. Assuming 50% and 20% of pediatric and adult patients, respectively, will be hospitalized for a VOC attack, we estimate ~60,000 patients <18 years old and ~70,000 patients between 18 and 30 will be admitted for a VOC attack, totaling ~130,000 patients in 2024. We cross referenced and confirmed these estimates with emergency room admissions for SCD, which averaged ~110,000 hospitalizations for SCD in 2005 (Brousseau D et al. 2010).

We assume peak Rivipansel market share of 45% in both pediatric and adult SCD patients, and one course of Rivipansel will be priced ~$12,500 in the US (assume a 3% price increase in US per year). Market research supports a possible 12x premium to hydroxyurea pricing if the drug proves to be able to reduce time to VOC resolution. Additionally, given the orphan indication of this drug, we believe this premium is justifiable. Therefore, total revenue for 2024 is estimated to peak ~$854M. Finally, based on the partnership agreement with Pfizer, we assume a royalty payment of ~15%, totaling ~$130M total to GlycoMimetics. After a 10% royalty paid to the University of Basel and an assumed 37% tax rate, final revenue to GLYC is ~$73M.

For ex-US sales, we assumed the same assumptions as above. However, we increased ex-US population to be 1.75x higher than US population based on epidemiology studies. Additionally, we assume similar patient share in all lines of therapy, but our cost is $9,375 per treatment, representing a 25% discount compared to US prices. Therefore, we assume a peak ex-US sale of ~$949M.

Figure 3: Rivipansel US sales

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Sickle cell disease market model														
US population (M)	1.0%	321.2	324.4	327.6	330.9	334.2	337.6	340.9	344.3	347.8	351.3	354.8	358.3	361.9
Patients with sickle cell disease		115,729	120,978	126,464	132,199	138,194	144,461	151,013	157,861	165,020	172,504	180,327	188,505	197,053
SCD incidence	3.5%	*0.000360*	*0.000373*	*0.000386*	*0.000400*	*0.000413*	*0.000428*	*0.000443*	*0.000458*	*0.000474*	*0.000491*	*0.000508*	*0.000526*	*0.000544*
Patients with SCD under 18		26,618	27,825	29,087	30,406	31,785	33,226	34,733	36,308	37,955	39,676	41,475	43,356	45,322
% of US population under 18		*23%*	*23%*	*23%*	*23%*	*23%*	*23%*	*23%*	*23%*	*23%*	*23%*	*23%*	*23%*	*23%*
Hospitalization due to VOC	50.0%	39,927	41,737	43,630	45,609	47,677	49,839	52,099	54,462	56,932	59,514	62,213	65,034	67,983
VOC attacks per year		*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*
Patients with SCD between 18 and 30		34,719	36,293	37,939	39,660	41,458	43,338	45,304	47,358	49,506	51,751	54,098	56,551	59,116
% of US population (18 and 30)		*30%*	*30%*	*30%*	*30%*	*30%*	*30%*	*30%*	*30%*	*30%*	*30%*	*30%*	*30%*	*30%*
Hospitalization due to VOC	20.0%	41,663	43,552	45,527	47,592	49,750	52,006	54,365	56,830	59,407	62,101	64,918	67,862	70,939
VOC attacks per year		*6.0*	*6.0*	*6.0*	*6.0*	*6.0*	*6.0*	*6.0*	*6.0*	*6.0*	*6.0*	*6.0*	*6.0*	*6.0*
Total hospitalization		81,589	85,289	89,157	93,200	97,427	101,845	106,464	111,292	116,339	121,615	127,130	132,896	138,923
GMI-1070 penetration														
% of pediatric patients	0.0%					*10.0%*	*25.0%*	*40.0%*	*42.5%*	*45.0%*	*45.0%*	*45.0%*	*45.0%*	*45.0%*
Total pediatric Tx courses					-	4,768	12,460	20,840	23,146	25,619	26,781	27,996	29,265	30,593
% of patients between 18 and 30	0.0%					*10.0%*	*25.0%*	*40.0%*	*42.5%*	*45.0%*	*45.0%*	*45.0%*	*45.0%*	*45.0%*
Total young adult Tx courses					-	4,975	13,002	21,746	24,153	26,733	27,946	29,213	30,538	31,923
Number of course of GMI-1070					-	9,743	25,461	42,586	47,299	52,353	54,727	57,209	59,803	62,515
Gross price	3.0%					12,500.00	12,875.00	13,261.25	13,659.09	14,068.86	14,490.93	14,925.65	15,373.42	15,834.63
GMI-1070 Revenue					-	121.78	327.81	564.74	646.06	736.54	793.04	853.88	919.38	989.90
Royalty payment to GLYC	15.0%				-	18.27	49.17	84.71	96.91	110.48	118.96	128.08	137.91	148.49
% Royalty to university of Basel	10%					1.83	4.92	8.47	9.69	11.05	11.90	12.81	13.79	14.85
Tax	37%							28.21	32.27	36.79	39.61	42.65	45.92	49.45
Final Revenue to GLYC						16.44	44.25	48.03	54.95	62.64	67.45	72.62	78.19	84.19

Source: Canaccord Genuity estimates

Figure 4: Rivipansel ex-US sales

		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Sickle cell disease market model														
Ex-US population (M)	1.0%	562.1	567.7	573.3	579.1	584.9	590.7	596.6	602.6	608.6	614.7	620.9	627.1	633.3
Patients with sickle cell disease		202,526	211,711	221,312	231,348	241,840	252,807	264,272	276,257	288,785	301,882	315,572	329,883	344,843
SCD incidence	3.5%	*0.000360*	*0.000373*	*0.000386*	*0.000400*	*0.000413*	*0.000428*	*0.000443*	*0.000458*	*0.000474*	*0.000491*	*0.000508*	*0.000526*	*0.000544*
Patients with SCD under 18		47,594	49,752	52,008	54,367	56,832	59,410	62,104	64,920	67,864	70,942	74,159	77,523	81,038
% of US population under 18		*24%*	*24%*	*24%*	*24%*	*24%*	*24%*	*24%*	*24%*	*24%*	*24%*	*24%*	*24%*	*24%*
Hospitalization due to VOC	50.0%	71,390	74,628	78,012	81,550	85,249	89,115	93,156	97,381	101,797	106,413	111,239	116,284	121,557
VOC attacks per year		*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*
Patients with SCD between 18 and 30		60,758	63,513	66,394	69,404	72,552	75,842	79,282	82,877	86,636	90,564	94,672	98,965	103,453
% of US population (18 and 30)	0.7%	*30%*	*30%*	*30%*	*30%*	*30%*	*30%*	*30%*	*30%*	*30%*	*30%*	*30%*	*30%*	*30%*
Hospitalization due to VOC	20.0%	72,909	76,216	79,672	83,285	87,062	91,011	95,138	99,452	103,963	108,677	113,606	118,758	124,144
VOC attacks per year		*6.0*	*6.0*	*6.0*	*6.0*	*6.0*	*6.0*	*6.0*	*6.0*	*6.0*	*6.0*	*6.0*	*6.0*	*6.0*
Total hospitalization		144,300	150,844	157,685	164,836	172,311	180,125	188,294	196,833	205,759	215,091	224,845	235,042	245,701
GMI-1070 penetration														
% of pediatric patients	0.0%						*10.0%*	*25.0%*	*40.0%*	*42.5%*	*45.0%*	*45.0%*	*45.0%*	*45.0%*
Total pediatric Tx courses					-	-	8,911	23,289	38,952	43,264	47,886	50,058	52,328	54,701
% of patients between 18 and 30	0.0%						*10.0%*	*25.0%*	*40.0%*	*42.5%*	*45.0%*	*45.0%*	*45.0%*	*45.0%*
Total young adult Tx courses					-	-	9,101	23,784	39,781	44,184	48,905	51,123	53,441	55,865
Number of course of GMI-1070					-	-	18,013	47,073	78,733	87,448	96,791	101,180	105,769	110,565
Gross price						9,375.00	9,375.00	9,375.00	9,375.00	9,375.00	9,375.00	9,375.00	9,375.00	9,375.00
GMI-1070 Revenue					-	-	168.87	441.31	738.12	819.82	907.41	948.56	991.58	1,036.55
Royalty payment to GLYC	15.0%				-	-	25.33	66.20	110.72	122.97	136.11	142.28	148.74	155.48
% Royalty to university of Basel	10%					-	2.53	6.62	11.07	12.30	13.61	14.23	14.87	15.55
Tax	37%							22.04	36.87	40.95	45.33	47.38	49.53	51.78
Final Revenue to GLYC						-	22.80	37.53	62.78	69.73	77.18	80.68	84.33	88.16

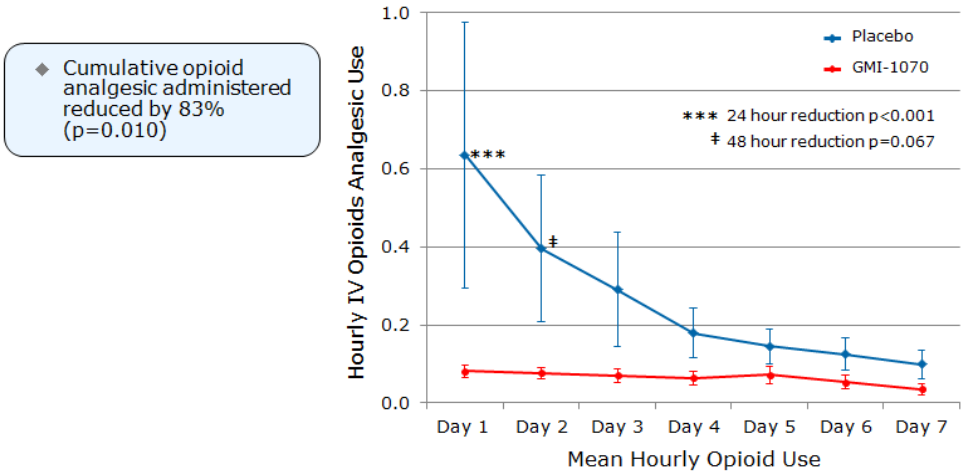
Source: Canaccord Genuity estimates

RIVIPANSEL SHOWS IMPROVEMENT IN MULTIPLE OUTCOMES

GlycoMimetics reported compelling Phase 2 data in its lead program, Rivipansel, for the treatment of VOC in hospitalized SCD patients, where reduction in hospitalization durations and significant reduction in opioid use was described. The trial was a randomized, double-blind, placebo-controlled trial at 22 sites in the US and Canada. The primary endpoint is reduction in time to resolution of VOC and secondary endpoints include safety, PK, and biomarkers for inflammation. Patients between the ages of 12 to 60 who were diagnosed with SCD and hospitalized or in the process of admission for VOC were enrolled. The patient must be able to receive the first dose of study drug within 24 hours of initial medical evaluation in the ED to be included in the study, or the subject can be treated as an outpatient within the prior 48 hours for a VOC episode if dosing is expected within 24 hours of the second presentation. A total of 76 patients were enrolled (43 in Rivipansel group and 33 in placebo). Patients received Rivipansel at two dosages: 1) low-dose group received a loading dose of 20 mg/kg, followed by 10 mg/kg every 12 hours; and 2) high-dose group received a loading dose of 40 mg/kg, followed by a 20 mg/kg dose every 12 hours.

Results demonstrated that use of Rivipansel improved multiple outcomes, including time to resolution of VOC symptoms, length of hospital stay, and requirement for parenteral opioid analgesia. The cumulative amount of opioid analgesic administered during hospitalization was significantly reduced by 83% (p=0.01), demonstrating the decrease in VOC-induced pain. Importantly, 24-hour reduction of IV opioids was also significantly decreased (P<0.01), reflecting the fast relief of pain symptoms with Rivipansel (Figure 5).

Figure 5: Early and significant reduction in hourly opioid analgesic administered

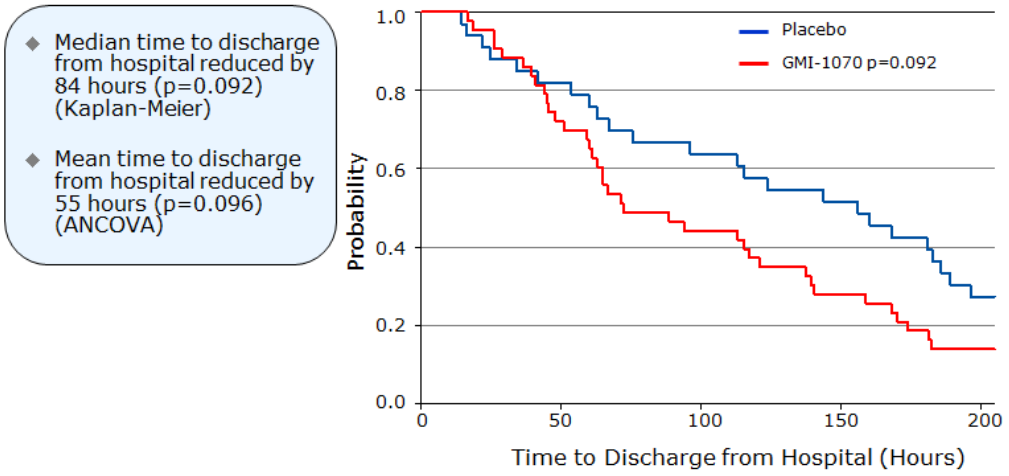


Source: GlycoMimetics Corporate Presentation

The reduction of pain, as represented by decrease in opioid requirements, translated to a trend toward resolution of VOC symptoms and decreased hospital duration. Patients on the Rivipansel group had a median reduction in time to resolution of VOC by 63 hours

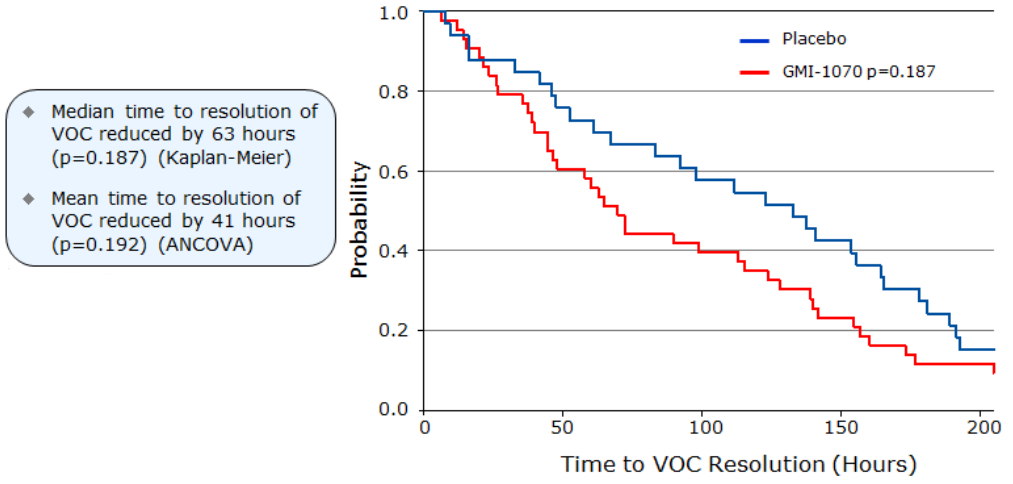
(P=0.187) and mean reduction time by 41 hours (p=0.192). Additionally, median time to discharge from hospital was reduced by a median time of 84 hours (p=0.092) and a mean time of 55 hours (p=0.096). Although these results did not hit statistical endpoint due to the low sample size, we believe the observed clinical benefit and trend toward positive outcomes demonstrate the efficacy of this medication.

Figure 6: Median time to discharge from hospital reduced by 84 hours



Source: GlycoMimetics Corporate Presentation

Figure 7: Median time to resolution of VOC reduced by 63 hours



Source: GlycoMimetics Corporate Presentation

The frequency of adverse events was similar between the two arms, with the most common side effect being rehospitalization for VOC for both groups. Acute chest syndrome occurred in six patients receiving Rivipansel and three in the placebo arm. Therefore, based on the favorable side-effect profile and the positive clinical efficacy reported in this trial, we believe Rivipansel has the potential to become the first-in-class drug to be approved for VOC.

UPCOMING PHASE 3 TRIAL DELAYED, MANAGEABLE

We believe the delay of the upcoming Phase 3 trial by Pfizer, which is currently responsible for further clinical development of Rivipansel, is a manageable setback for on-time FDA filing. Pfizer recently announced the delay due to manufacturing issues impacting formulated drug supply. Currently, the company is not giving any guidance as to when Phase 3 trials of Rivipansel or trials with the subcutaneous formulation will be initiated. Therefore, we expect a potential launch date of 2018.

The Phase 3 trial is well designed, in our view, based on the experiences from the Phase 2 trial. The primary endpoint is time to readiness for discharge, while secondary outcomes are time to discharge, cumulative opioid use, time to discontinuation of opioids, cumulative opioid use within first 24 hours, and re-hospitalization within three days of discharge. The company estimates it will enroll ~350 patients among both adults and pediatric patients suffering from VOD, which we believe is a positive given the trend toward statistical significance for nearly every efficacy endpoints in the Phase 2 data.

GM-1271 POTENTIAL TO PENETRATE FRONTLINE AML LANDSCAPE

E-SELECTIN IN AML

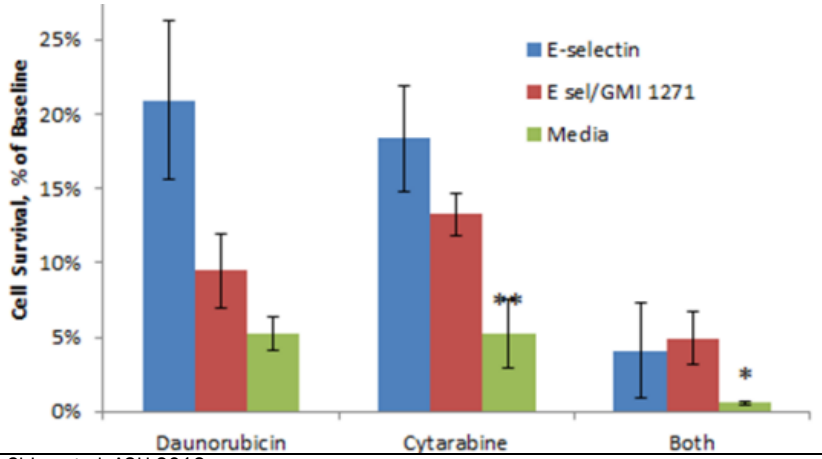
From a pathologic standpoint, the spread of leukemia extends from mobilization of leukemic blast cells from the bone marrow to extramedullary tissue infiltration. Interestingly, data shows that the migration of these leukemic blast cells resembles that of neutrophils and may be regulated by activated endothelial cells via endothelial adhesion molecules, specifically E-selectin. Therefore, we believe E-selectin can potentially play an important role in the progression of acute myeloid leukemia (AML).

In several studies, E-selectin has been shown to mediate tumor dissemination, enable tumor trafficking to bone marrow microdomains, and facilitate tumor cell sequestering in bone marrow niche where tumor stem cells are protected from chemotherapy. In vitro data has shown the protective effects of E-selectin to the blast cells, protecting the malignant neoplasm from the effects of chemotherapy. Moreover, levels of E-selectin have been correlated with tumor infiltration and relapse and survival rates. Taken this together, we see potential to synergistically combine E-selectin antagonists with current cytotoxic regimens to increase the effectiveness of the chemotherapy.

PRECLINICAL DATA INTERESTING

In vitro data that combined GMI-1271 with standard leukemic chemotherapy regimens (daunorubicin, cytarabine, or both) showed significant reduction of tumor burden compared with chemotherapy alone. The data presented at ASH confirmed the pathologic chemotherapy protection afforded by binding to E-selectin. In the figure below, cells plated on E-selectin exhibited improved survival compared with cells plated on media. However, when GMI-1271 was introduced, the compound reversed this E-selectin-mediated drug resistance and decreased tumor cell survival significantly.

Figure 8: E-selectin/GMI-1271 conferring chemotherapy drug resistance in vitro

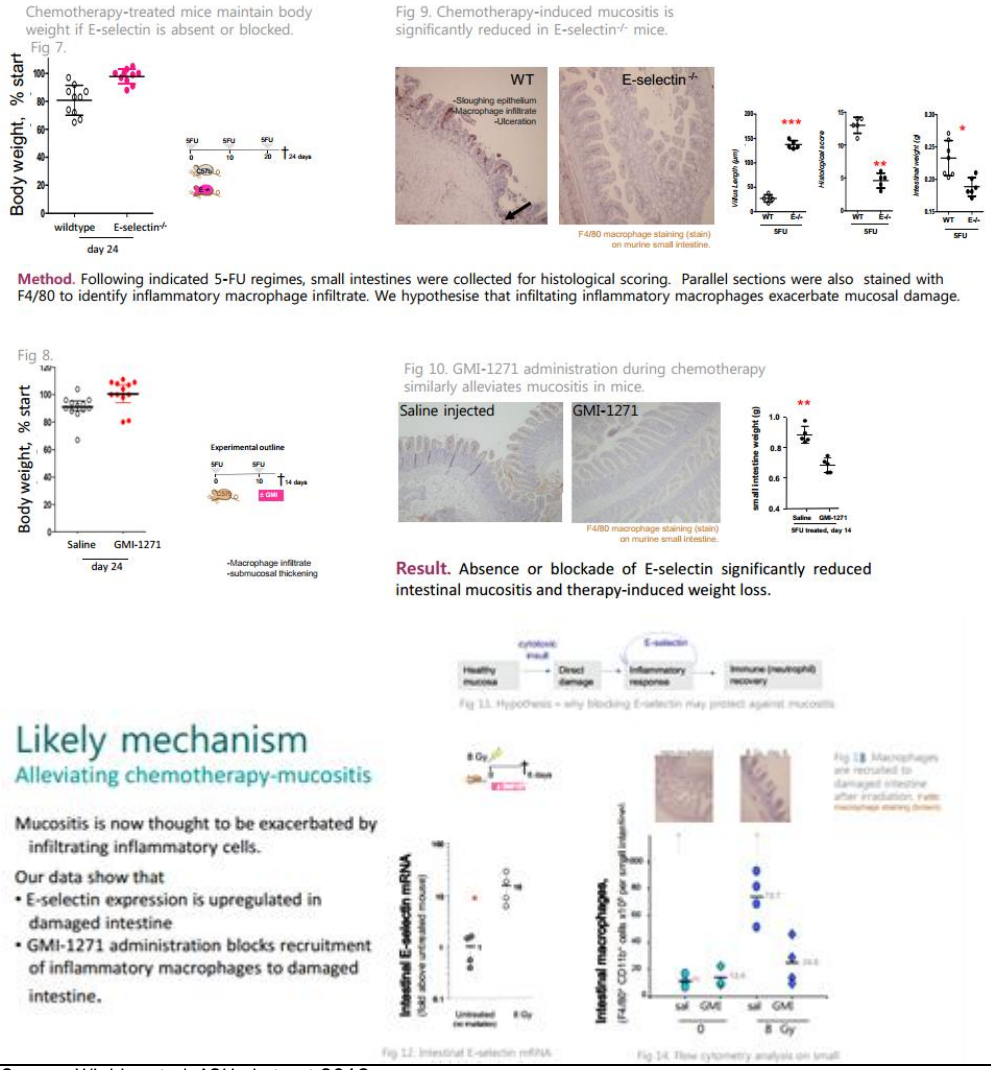


Source: Chien et al. ASH 2012

Additional data in mouse models were discussed in a 2013 presentation that was selected for “Best of ASH”, demonstrating that combination of GMI-1271 with chemotherapy reduced tumor burden and survival compared to chemotherapy alone. Furthermore, there was reduction in chemotherapy-induced mucositis, neutropenia, thrombus formation, and metastasis when standard therapy was combined with GMI-1271 (Figure 9). We believe that treatment with GMI-1271 may result in lower bone marrow toxicity due to its inhibition of E-selectin, thereby making hematopoietic stem cells divide less frequently and protecting them from chemotherapy agents that target rapidly dividing cells. GLYC is currently considering reductions in some of the toxicities of chemotherapy as secondary efficacy endpoints in future clinical studies.

Based on these clinical studies, the company initiated a Phase 1 clinical trial earlier this year for the treatment of AML as adjunct to standard chemotherapy. This dose-escalation trial in healthy volunteers is to be followed by a Phase 1/2 multiple dose-escalation clinical trial in defined populations of patients with AML. Once dose-escalation is complete, GLYC plans to extend the Phase 1/2 clinical trial into specific patient populations in two or three randomized, placebo-controlled clinical trials. Each of these randomized clinical trials will evaluate a different group of patients with AML. We expect interim data from the Phase 1 portion of the Phase 1/2 study by mid-2015.

Figure 9: GMI-1271 reduced intestinal mucositis



Source: Winkler et al. ASH abstract 2013

Figure 10: GLYC income statement

	2011A	2012A	2013A	Q1/14A	Q2/14A	Q3/14E	Q4/14E	2014E	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E
GMI-1070																		
US	-	-	-	-	-	-	-	-	-	-	-	16.4	44.3	48.0	54.9	62.6	67.4	72.6
Ex-US													22.8	37.5	62.8	69.7	77.2	80.7
Product revenues	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**16.4**	**67.1**	**85.6**	**117.7**	**132.4**	**144.6**	**153.3**
Collaboration revenue	3.8	15.3	4.0	-	15.0		10.00	25.0	35.0	35.0	60.0	50.0		50.0		-	-	-
Total revenues	**3.8**	**15.3**	**4.0**	**-**	**15.0**	**-**	**10.0**	**25.0**	**35.0**	**35.0**	**60.0**	**66.4**	**67.1**	**135.6**	**117.7**	**132.4**	**144.6**	**153.3**
Cost of goods sold		-	-	-	-	-	-											
Gross Profit	**3.8**	**15.3**	**4.0**	**-**	**15.0**	**-**	**10.00**	**25.0**	**35.0**	**35.0**	**60.0**	**66.4**	**67.1**	**135.6**	**117.7**	**132.4**	**144.6**	**153.3**
R&D expense	7.8	9.4	11.7	3.9	5.4	6.0	7.0	22.2	29.1	60.0	60.6	61.2	61.8	62.4	63.1	63.7	64.3	65.0
SG&A expense	2.1	2.2	2.9	1.2	1.6	1.7	1.8	6.3	7.5	3.5	3.7	3.9	4.1	4.3	4.5	4.7	4.9	5.2
Other operating expense	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total operating expense	**9.9**	**11.6**	**14.6**	**5.1**	**7.0**	**7.7**	**8.8**	**28.5**	**36.6**	**63.5**	**64.3**	**65.1**	**65.9**	**66.7**	**67.5**	**68.4**	**69.3**	**70.1**
Operating income	**(6.1)**	**3.6**	**(10.6)**	**(5.1)**	**8.1**	**(7.7)**	**1.2**	**(3.5)**	**(1.6)**	**(28.5)**	**(4.3)**	**1.4**	**1.2**	**68.9**	**50.2**	**64.0**	**75.4**	**83.2**
Net Interest/Investment income	0.0	0.0												0.0	0.0	0.0	0.0	0.0
(interest expense)	(0.0)	(0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0					0.1	0.1	0.1	0.1	0.1
Other non-operating income (expense)	-	(0.0)	(0.0)	0.0				-	-	-	-	-	-	-	-	-	-	-
Interest and other, Net	0.0	(0.0)	(0.0)	-	-	-	-	-	-	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.1)	(0.2)	(0.3)
Pre-tax income	**(6.1)**	**3.6**	**(10.6)**	**(5.1)**	**8.1**	**(7.7)**	**1.2**	**(3.5)**	**(1.6)**	**(28.5)**	**(4.3)**	**1.4**	**1.2**	**68.9**	**50.3**	**64.0**	**75.4**	**83.2**
Net income (loss)	**(6.1)**	**3.6**	**(10.6)**	**(5.1)**	**8.0**	**(7.7)**	**1.2**	**(3.5)**	**(1.6)**	**(28.5)**	**(4.3)**	**1.4**	**1.2**	**68.9**	**50.3**	**64.0**	**75.4**	**83.2**
Basic EPS	**(6.58)**	**3.93**	**(8.85)**	**(0.30)**	**0.42**	**(0.41)**	**0.07**	**(0.19)**	**(0.09)**	**(1.53)**	**(0.23)**	**0.07**	**0.06**	**3.64**	**2.64**	**3.35**	**3.92**	**4.30**
Diluted EPS	**(6.58)**	**0.33**	**(8.85)**	**(0.30)**	**0.39**	**(0.41)**	**0.07**	**(0.19)**	**(0.09)**	**(1.53)**	**(0.23)**	**0.07**	**0.06**	**3.64**	**2.64**	**3.35**	**3.92**	**4.30**
Basic shares outstanding	0.9	0.9	1.2	17.2	18.8	18.9	19.0	18.5	18.5	18.6	18.7	18.8	18.9	19.0	19.0	19.1	19.2	19.3
Diluted shares outstanding	0.9	11.0	1.2	17.2	20.2	18.9	19.0	18.5	18.5	18.6	18.7	18.8	18.9	19.0	19.0	19.1	19.2	19.3

Source: Canaccord Genuity estimates and company reports

Figure 11: GLYC balance sheet

Balance Sheet	2011A	2012A	2013A	Q1/14A	Q2/14A	Q3/14E	4Q14E	2014E	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E
Assets																		
Cash & ST Investments	28.2	17.4	2.3	57.0	66.2	58.5	59.8	59.8	108.2	104.7	100.4	101.8	101.8	170.7	221.0	285.0	360.4	185.0
Receivables (Net)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Inventories				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Prepaid Expenses		-		-	-	2.0	2.1	2.1	2.2	3.7	4.0	3.9	3.9	3.9	6.0	8.0	10.3	13.1
Other Current Assets	0.2	0.6	2.6	0.7	0.9	7.4	7.7	7.7	7.9	13.5	14.3	14.0	14.0	14.1	21.6	28.7	37.1	47.1
Total Current Assets	**28.4**	**18.0**	**4.9**	**57.7**	**67.1**	**68.0**	**69.6**	**69.6**	**118.2**	**121.9**	**118.6**	**119.6**	**119.7**	**188.7**	**248.5**	**321.6**	**407.8**	**245.2**
Investment In Unconsolidated Subsidiaries				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Property Plant & Equipment - Gross	0.9	1.2	1.2	1.2	1.2	**5.6**	**5.8**	**5.8**	**5.9**	**10.1**	**10.7**	**10.5**	**10.6**	**10.6**	**16.2**	**21.6**	**27.9**	**35.5**
Less: Accumulated Depreciation	(0.7)	(0.8)	(0.8)	(0.8)	(0.8)	**(0.8)**	**(0.9)**	**(0.9)**	**(0.9)**	**(1.5)**	**(1.6)**	**(1.6)**	**(1.6)**	**(1.6)**	**(2.4)**	**(3.2)**	**(4.2)**	**(5.3)**
Other Assets	0.3			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Intangible Assets				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total noncurrent asset	**0.5**	**0.5**	**0.4**	**0.4**	**0.4**	**2.3**	**2.4**	**4.9**	**5.0**	**8.6**	**9.1**	**8.9**	**9.0**	**9.0**	**13.8**	**18.4**	**23.8**	**30.2**
Total Assets	**28.9**	**18.4**	**5.3**	**58.1**	**67.5**	**70.2**	**71.9**	**71.9**	**123.2**	**130.5**	**127.7**	**128.5**	**128.7**	**197.7**	**262.4**	**340.0**	**431.6**	**275.4**
Accounts Payable	0.5	0.8	1.1	1.8	0.5	6.5	6.8	**7.0**	7.0	11.9	12.6	12.4	12.4	12.4	19.1	25.4	32.9	41.7
ST Debt & Current Portion of LT Debt	15.0	4.0		0.2	0.4	0.6	0.7	-	0.7	1.2	1.2	1.2	1.2	1.2	1.9	2.5	3.2	4.1
Other Accrued Expense	0.8	0.8	1.0	0.6	2.6	5.7	6.0	-	6.1	10.5	11.1	10.8	10.9	10.9	16.8	22.3	28.8	36.6
Income Tax	0.1	0.1	0.1	0.1	0.1	0.3	0.3	-	0.3	0.6	0.6	0.6	0.6	0.6	0.9	1.2	1.5	1.9
Total Current Liabilities	**16.4**	**5.7**	**2.3**	**2.6**	**3.6**	**13.2**	**13.7**	**13.7**	**14.1**	**24.1**	**25.5**	**25.0**	**25.1**	**25.1**	**38.6**	**51.3**	**66.4**	**84.3**
Long Term Debt			-	-	-	**0.4**	**0.4**	**0.4**	**0.4**	**0.6**	**0.7**	**0.7**	**0.7**	**0.7**	**1.0**	**1.4**	**1.8**	**2.2**
LT Debt Excl Capitalized Leases				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Capitalized Lease Obligations				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Deferred Taxes				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Deferred Taxes - Credit				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Deferred Taxes - Debit				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Other Liabilities	**4.0**	**0.2**	**0.1**	**0.1**	**0.0**	**0.3**	**0.3**	**0.3**	**0.3**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.8**	**1.1**	**1.4**	**1.8**
Total Liabilities	**20.5**	**5.9**	**2.4**	**2.7**	**3.6**	**13.5**	**14.0**	**14.0**	**0.7**	**1.1**	**1.2**	**1.2**	**1.2**	**1.2**	**1.8**	**2.4**	**3.2**	**4.0**
Non-Equity Reserves			-	-	-													
Minority Interest				-	-													
Preferred Stock				-	-													
Preferred Stock Non-Redeemable				-	-													
Preferred Stock Redeemable				-	-													
Common Equity																		
Common Stock	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**													
Capital Surplus	**64.8**	**65.2**	**66.2**	**123.7**	**124.3**				**50.0**	**25.0**								
Other Appropriated Reserves				-	-			-										
Retained Earnings	**(56.3)**	**(52.7)**	**(63.3)**	**(68.4)**	**(60.4)**			-				-						
Less: Treasury Stock				-	-			-				-						
Total Shareholders Equity	**8.5**	**12.5**	**2.9**	**55.4**	**63.9**	**56.8**	**57.9**	**57.9**	**122.6**	**129.4**	**126.5**	**127.4**	**127.5**	**196.5**	**260.5**	**337.5**	**428.5**	**271.4**
Total Liabilities & Shareholders' Equity	**28.9**	**18.4**	**5.3**	**58.1**	**67.5**	**70.2**	**71.9**	**71.9**	**123.2**	**130.5**	**127.7**	**128.5**	**128.7**	**197.7**	**262.4**	**340.0**	**431.6**	**275.4**
Total Common Shares Outstanding	1.4	1.4	1.4	18.9	18.8	18.8	18.8	18.8	18.8	18.8	18.8	18.8	18.8	18.8	18.8	18.8	18.8	18.8

Source: Canaccord Genuity estimates and company reports

Figure 12: GLYC cash flow statement

($000's) [FY-DEC]	2011A	2012A	2013A	Q1/14A	Q2/14A	Q3/14E	Q4/14E	2014E	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E
Cash Flow Statement																		
Net Income / Starting Line	(6.11)	3.66	(10.61)	(5.10)	7.99	(7.68)	1.24	(3.55)	(1.61)	(28.50)	(4.28)	1.38	1.18	68.93	50.25	64.04	75.42	83.21
Depreciation, Depletion & Amortization	0.08	0.10	0.13	0.03	0.04			0.07										
Depreciation & Depletion	0.00	-	-					-					-	-	-	-	-	-
Amortization of Intangible Assets	-	-	-		-			-	-	-	-		-	-	-	-	-	-
Deferred Income Taxes	0.38	0.42	0.43		-			-					-					-
Other Cash Flow				0.29	0.42			0.71					-					-
Extraordinary Items	0.00	-	-	-	-			-					-					
Funds From/For Other Operating Activities			(0.24)	2.19	0.76			2.95					-					-
Dec(Inc) In Receivables	-	-	-					-					-					-
Dec(Inc) In Inventories	-	-	-					-					-					-
Inc(Dec) In Accounts Payable	0.08	0.23	0.38					-					-					-
Inc(Dec) In Income Taxes Payable	-	-	-					-										
Inc(Dec) In Other Accruals	0.31	0.02	0.19					-										
Dec(Inc) In Other Assets/Liabilities	19.11	(14.89)	(6.06)					-										
Cash from Operating Activities	**13.85**	**(10.47)**	**(15.78)**	**(2.59)**	**9.21**	**(8)**	**1**	**0**	**(2)**	**(29)**	**(4)**	**1**	**1**	**69**	**50**	**64**	**75**	**83**
Capital Expenditures	(0.24)	(0.33)	(0.08)	(0.01)	(0.08)	-		(0)										
Cash from Investing Activities	**(0.24)**	**(0.33)**	**(0.08)**	**(0.01)**	**(0.08)**	**-**	**-**	**(0)**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Proceeds From Stock Options				-	0.13			0.13										
Other Proceeds From Sale/Issuance of Stock	(0.02)	-	0.56	57.26	(0.01)			57.25	50.00	25.00								
Com/Pfd Purchased				-	-			-					-			-	-	-
Long Term Borrowings				-	-			-		-	-		-	-	-	-	-	-
Reduction In Long Term Debt				-	-			-		-	-		-	-	-	-	-	-
Inc(Dec) In Short Term Borrowings				-	-			-		-	-		-	-	-	-	-	-
Cash Dividends Paid - Total				-	-			-		-	-		-	-	-	-	-	-
Other Sources - Financing				-	-			-					-					-
Other Uses - Financing				-	-			-					-					-
Cash from Financing Activities	**(0.02)**	**-**	**0.56**	**57.26**	**0.12**	**-**	**-**	**57.38**	**50.00**	**25.00**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Net Change in Cash	**13.59**	**(10.80)**	**(15.30)**	**54.66**	**9.25**	**(8)**	**1**	**57**	**48**	**(4)**	**(4)**	**1**	**42**	**69**	**50**	**64**	**75**	**83**
Beginning balance	14.58	28.17	17.37	2.31	56.97	66	59	2	60	108	105	100	60	102	171	221	285	102
Net cash - ending balance	**28.17**	**17.37**	**2.07**	**56.97**	**66.22**	**59**	**60**	**60**	**108**	**105**	**100**	**102**	**102**	**171**	**221**	**285**	**360**	**185**

Source: Canaccord Genuity estimates and company reports

Investment risks

Clinical risk – GlycoMimetics' current Phase 3 trial may not be successful. We note that there has been relatively little drug development in SCD and no successful clinical trials that have led to the approval of drugs for the disease based on the endpoint GlycoMimetics is pursuing. Further, the Phase 2 trial of Rivipansel did not meet its primary endpoint (the same endpoint in the Phase 3 trial design) due to data variability. However, we feel the expansion of the patient numbers in the upcoming Phase 3 trial will compensate for the data variability inherent to SCD trials. Additionally, the current manufacturing issues from Pfizer may significantly delay the start of Phase 3 trials and push back our expected launch date of 2018 even further.

Clinical risk – Additional clinical investigation may show Rivipansel to have an unacceptable safety and tolerability signal. GMI-1070's selectin-based mechanism could potentially interfere with immune responses to infection, thereby increasing risk of infections, opportunistic and otherwise. The only serious adverse event in the Phase 2 trial was one case that was controlled and resolved without discontinuation of treatment.

Regulatory risk – Rivipansel may not be approved by the FDA and/or EMA despite Phase 3 success. We note the only approved drug for treatment of SCD is indicated for the prevention of the number of crises, rather than reduction of the duration of crisis (the trial design). There is no precedent for the approval of SCD drugs based on reduction of length of hospitalization.

Competitive risk – GlycoMimetics faces potential competition from other agents seeking to decrease the time to resolution of SCD crises, as well as indirect competition from agents being developed to prevent the onset of crises.

Commercialization risk – There is little to no precedent for the successful promotion to the sickle cell disease market. Hydroxyurea, the only currently-approved drug for the treatment of SCD, has been available in multiple generic forms for SCD for a number of years, and is no longer promoted by Bristol-Myers, its original SCD sponsor. Commercial uptake has historically been extremely limited. As such, we see no precedent for the successful launch and promotion of a drug for SCD.

Reimbursement risk – There is no guarantee that GlycoMimetics, or its partners, will garner reimbursement for GMI-1070. There has historically been significant skepticism regarding the market opportunity in SCD due to concerns about insurance coverage rates of the affected population. We also note GMI-1070's initially pursued indication would dictate its use in the hospital setting, which will require prior approval from hospital P&T committees.

Financing risk – GlycoMimetics will likely require additional funding, which may be sought in the equity markets. An equity raise could impact the price of GLYC’s stock price, especially if investors believe they will experience meaningful dilution.

APPENDIX: IMPORTANT DISCLOSURES

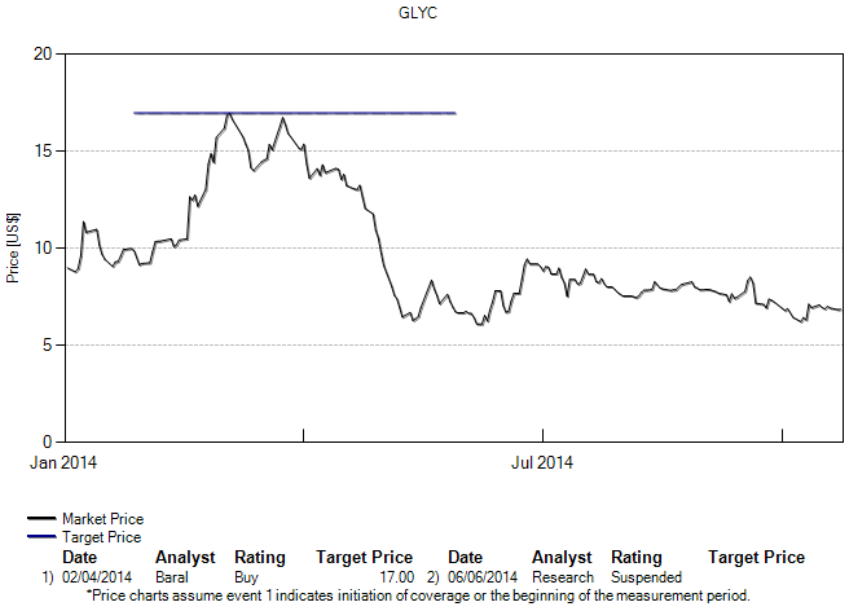
Analyst Certification: Each authoring analyst of Canaccord Genuity whose name appears on the front page of this research hereby certifies that (i) the recommendations and opinions expressed in this research accurately reflect the authoring analyst's personal, independent and objective views about any and all of the designated investments or relevant issuers discussed herein that are within such authoring analyst's coverage universe and (ii) no part of the authoring analyst's compensation was, is, or will be, directly or indirectly, related to the specific recommendations or views expressed by the authoring analyst in the research.

Analysts employed outside the US are not registered as research analysts with FINRA. These analysts may not be associated persons of Canaccord Genuity Inc. and therefore may not be subject to the NASD Rule 2711 and NYSE Rule 472 restrictions on communications with a subject company, public appearances and trading securities held by a research analyst account.

Compendium Report: If this report covers six or more subject companies, it is a compendium report and Canaccord Genuity and its affiliated companies hereby direct the reader to the specific disclosures related to the subject companies discussed in this report, which may be obtained at the following website (provided as a hyperlink if this report is being read electronically) http://disclosures.canaccordgenuity.com/EN/Pages/default.aspx; or by sending a request to Canaccord Genuity Corp. Research, Attn: Disclosures, P.O. Box 10337 Pacific Centre, 2200-609 Granville Street, Vancouver, BC, Canada V7Y 1H2; or by sending a request by email to disclosures@canaccordgenuity.com. The reader may also obtain a copy of Canaccord Genuity's policies and procedures regarding the dissemination of research by following the steps outlined above.

Site Visit: An analyst has not visited GlycoMimetics' material operations.

Price Chart:*



	Date	Analyst	Rating	Target Price		Date	Analyst	Rating	Target Price
1)	02/04/2014	Baral	Buy	17.00	2)	06/06/2014	Research	Suspended	

*Price charts assume event 1 indicates initiation of coverage or the beginning of the measurement period.

Distribution of Ratings:
Global Stock Ratings
(as of 1 October 2014)

	Coverage Universe		IB Clients
Rating	**#**	**%**	**%**
Buy	627	60.2%	36.7%
Speculative Buy	53	5.1%	54.7%
Hold	317	30.5%	13.9%
Sell	43	4.1%	2.3%
	1041	100.0%	

*Total includes stocks that are Under Review

Canaccord Genuity Ratings System:

BUY: The stock is expected to generate risk-adjusted returns of over 10% during the next 12 months.
HOLD: The stock is expected to generate risk-adjusted returns of 0-10% during the next 12 months.
SELL: The stock is expected to generate negative risk-adjusted returns during the next 12 months.
NOT RATED: Canaccord Genuity does not provide research coverage of the relevant issuer.

"Risk-adjusted return" refers to the expected return in relation to the amount of risk associated with the designated investment or the relevant issuer.

Risk Qualifier:

SPECULATIVE: Stocks bear significantly higher risk that typically cannot be valued by normal fundamental criteria. Investments in the stock may result in material loss.

Canaccord Genuity Research Disclosures as of 31 October 2014

Company	Disclosure
GlycoMimetics	1A, 2, 3, 5, 7

1	The relevant issuer currently is, or in the past 12 months was, a client of Canaccord Genuity or its affiliated companies. During this period, Canaccord Genuity or its affiliated companies provided the following services to the relevant issuer: A. investment banking services. B. non-investment banking securities-related services. C. non-securities related services.
2	In the past 12 months, Canaccord Genuity or its affiliated companies have received compensation for Corporate Finance/Investment Banking services from the relevant issuer.
3	In the past 12 months, Canaccord Genuity or any of its affiliated companies have been lead manager, co-lead manager or co-manager of a public offering of securities of the relevant issuer or any publicly disclosed offer of securities of the relevant issuer or in any related derivatives.
4	Canaccord Genuity acts as corporate broker for the relevant issuer and/or Canaccord Genuity or any of its affiliated companies may have an agreement with the relevant issuer relating to the provision of Corporate Finance/Investment Banking services.
5	Canaccord Genuity or one or more of its affiliated companies is a market maker or liquidity provider in the securities of the relevant issuer or in any related derivatives.
6	In the past 12 months, Canaccord Genuity, its partners, affiliated companies, officers or directors, or any authoring analyst involved in the preparation of this research has provided services to the relevant issuer for remuneration, other than normal course investment advisory or trade execution services.
7	Canaccord Genuity or one or more of its affiliated companies intend to seek or expect to receive compensation for Corporate Finance/Investment Banking services from the relevant issuer in the next six months.
8	The authoring analyst, a member of the authoring analyst's household, or any individual directly involved in the preparation of this research, has a long position in the shares or derivatives, or has any other financial interest in the relevant issuer, the value of which increases as the value of the underlying equity increases.
9	The authoring analyst, a member of the authoring analyst's household, or any individual directly involved in the preparation of this research, has a short position in the shares or derivatives, or has any other financial interest in the relevant issuer, the value of which increases as the value of the underlying equity decreases.
10	Those persons identified as the author(s) of this research, or any individual involved in the preparation of this research, have purchased/received shares in the relevant issuer prior to a public offering of those shares, and such person's name and details are disclosed above.
11	A partner, director, officer, employee or agent of Canaccord Genuity or its affiliated companies, or a member of his/her household, is an officer, or director, or serves as an advisor or board member of the relevant issuer and/or one of its subsidiaries, and such person's name is disclosed above.
12	As of the month end immediately preceding the date of publication of this research, or the prior month end if publication is within 10 days following a month end, Canaccord Genuity or its affiliated companies, in the aggregate, beneficially owned 1% or more of any class of the total issued share capital or other common equity securities of the relevant issuer or held any other financial interests in the relevant issuer which are significant in relation to the research (as disclosed above).
13	As of the month end immediately preceding the date of publication of this research, or the prior month end if publication is within 10 days following a month end, the relevant issuer owned 1% or more of any class of the total issued share capital in Canaccord Genuity or any of its affiliated companies.
14	Other specific disclosures as described above.

"Canaccord Genuity" is the business name used by certain wholly owned subsidiaries of Canaccord Genuity Group Inc., including Canaccord Genuity Inc., Canaccord Genuity Limited, Canaccord Genuity Corp., and Canaccord Genuity (Australia) Limited, an affiliated company that is 50%-owned by Canaccord Genuity Group Inc.

The authoring analysts who are responsible for the preparation of this research are employed by Canaccord Genuity Corp. a Canadian broker-dealer with principal offices located in Vancouver, Calgary, Toronto, Montreal, or Canaccord Genuity Inc., a US broker-dealer with principal offices located in New York, Boston, San Francisco and Houston, or Canaccord Genuity Limited., a UK broker-dealer with principal offices located in London (UK) and Dublin (Ireland), or Canaccord Genuity (Australia) Limited, an Australian broker-dealer with principal offices located in Sydney and Melbourne.

The authoring analysts who are responsible for the preparation of this research have received (or will receive) compensation based upon (among other factors) the Corporate Finance/Investment Banking revenues and general profits of Canaccord Genuity. However, such authoring analysts have not received, and will not receive, compensation that is directly based upon or linked to one or more specific Corporate Finance/Investment Banking activities, or to recommendations contained in the research.

Canaccord Genuity and its affiliated companies may have a Corporate Finance/Investment Banking or other relationship with the issuer that is the subject of this research and may trade in any of the designated investments mentioned herein either for their own account or the accounts of their customers, in good faith or in the normal course of market making. Accordingly, Canaccord Genuity or their affiliated companies, principals or employees (other than the authoring analyst(s) who prepared this research) may at any time have a long or short position in any such designated investments, related designated investments or in options, futures or other derivative instruments based thereon.

Some regulators require that a firm must establish, implement and make available a policy for managing conflicts of interest arising as a result of publication or distribution of research. This research has been prepared in accordance with Canaccord Genuity's policy on managing conflicts of interest, and information barriers or firewalls have been used where appropriate. Canaccord Genuity's policy is available upon request.

The information contained in this research has been compiled by Canaccord Genuity from sources believed to be reliable, but (with the exception of the information about Canaccord Genuity) no representation or warranty, express or implied, is made by Canaccord Genuity, its affiliated companies or any other person as to its fairness, accuracy, completeness or correctness. Canaccord Genuity has not independently verified the facts, assumptions, and estimates contained herein. All estimates, opinions and other information contained in this research constitute Canaccord Genuity's judgement as of the date of this research, are subject to change without notice and are provided in good faith but without legal responsibility or liability.

Canaccord Genuity's salespeople, traders, and other professionals may provide oral or written market commentary or trading strategies to our clients and our proprietary trading desk that reflect opinions that are contrary to the opinions expressed in this research. Canaccord Genuity's affiliates, principal trading desk, and investing businesses may make investment decisions that are inconsistent with the recommendations or views expressed in this research.

This research is provided for information purposes only and does not constitute an offer or solicitation to buy or sell any designated investments discussed herein in any jurisdiction where such offer or solicitation would be prohibited. As a result, the designated investments discussed in this research may not be eligible for sale in some jurisdictions. This research is not, and under no circumstances should be construed as, a solicitation to act as a securities broker or dealer in any jurisdiction by any person or company that is not legally permitted to carry on the business of a securities broker or dealer in that jurisdiction. This material is prepared for general circulation to clients and does not have regard to the investment objectives, financial situation or particular needs of any particular person. Investors should obtain advice based on their own individual circumstances before making an investment decision. To the fullest extent permitted by law, none of Canaccord Genuity, its affiliated companies or any other person accepts any liability whatsoever for any direct or consequential loss arising from or relating to any use of the information contained in this research.

For Canadian Residents: This research has been approved by Canaccord Genuity Corp., which accepts sole responsibility for this research and its dissemination in Canada. Canadian clients wishing to effect transactions in any designated investment discussed should do so through a qualified salesperson of Canaccord Genuity Corp. in their particular province or territory.

For United States Residents: Canaccord Genuity Inc., a US registered broker-dealer, accepts responsibility for this research and its dissemination in the United States. This research is intended for distribution in the United States only to certain US institutional investors. US clients wishing to effect transactions in any designated investment discussed should do so through a qualified salesperson of Canaccord Genuity Inc. Analysts employed outside the US, as specifically indicated elsewhere in this report, are not registered as research analysts with FINRA. These analysts may not be associated persons of Canaccord Genuity Inc. and therefore may not be subject to the NASD Rule 2711 and NYSE Rule 472 restrictions on communications with a subject company, public appearances and trading securities held by a research analyst account.

For United Kingdom and European Residents:

This research is distributed in the United Kingdom and elsewhere Europe, as third party research by Canaccord Genuity Limited, which is authorized and regulated by the Financial Conduct Authority. This research is for distribution only to persons who are Eligible Counterparties or Professional Clients only and is exempt from the general restrictions in section 21 of the Financial Services and Markets Act 2000 on the communication of invitations or inducements to engage in investment activity on the grounds that it is being distributed in the United Kingdom only to persons of a kind described in Article 19(5) (Investment Professionals) and 49(2) (High Net Worth companies, unincorporated associations etc) of the Financial Services and Markets Act 2000 (Financial Promotion) Order 2005 (as amended). It is not intended to be distributed or passed on, directly or indirectly, to any other class of persons. This material is not for distribution in the United Kingdom or elsewhere in Europe to retail clients, as defined under the rules of the Financial Conduct Authority.

For Jersey, Guernsey and Isle of Man Residents:

This research is sent to you by Canaccord Genuity Wealth (International) Limited (CGWI) for information purposes and is not to be construed as a solicitation or an offer to purchase or sell investments or related financial instruments. This research has been produced by an affiliate of CGWI for circulation to its institutional clients and also CGWI. Its contents have been approved by CGWI and we are providing it to you on the basis that we believe it to be of interest to you. This statement should be read in conjunction with your client agreement, CGWI's current terms of business and the other disclosures and disclaimers contained within this research. If you are in any doubt, you should consult your financial adviser.
CGWI is licensed and regulated by the Guernsey Financial Services Commission, the Jersey Financial Services Commission and the Isle of Man Financial Supervision Commission. CGWI is registered in Guernsey and is a wholly owned subsidiary of Canaccord Genuity Group Inc.

For Australian Residents:

This research is distributed in Australia by Canaccord Genuity (Australia) Limited ABN 19 075 071 466 holder of AFS Licence No 234666. To the extent that this research contains any advice, this is limited to general advice only. Recipients should take into account their own personal circumstances before making an investment decision. Clients wishing to effect any transactions in any financial products discussed in the research should do so through a qualified representative of Canaccord Genuity (Australia) Limited. Canaccord Genuity Wealth Management is a division of Canaccord Genuity (Australia) Limited.

For Singapore Residents:

This research is distributed pursuant to 32C of the Financial Advisers under an arrangement between each of the Canaccord Genuity entities that publish research and Canaccord Genuity Singapore Pte. Ltd who are an exempt financial adviser under section 23(1)(d) of the Financial Advisers Act. This research is only intended for persons who fall within the definition of accredited investor, expert investor or institutional investor as defined under section 4A of the Securities and Futures Act It is not intended to be distributed or passed on, directly or indirectly, to any other class of persons. Recipients of this report can contact Canaccord Genuity Singapore Pte. Ltd. (Contact Person: Tom Gunnersen's tel # is +852 3919 2561) in respect of any matters arising from, or in connection with, the [analyses or report].

For Hong Kong Residents:

This research is distributed in Hong Kong by Canaccord Genuity (Hong Kong) Limited who is licensed by the Securities and Futures Commission. This research is only intended for persons who fall within the definition of professional investor as defined in the Securities and Futures Ordinance. It is not intended to be distributed or passed on, directly or indirectly, to any other class of persons. Recipients of this report can contact Canaccord Genuity (Hong Kong). Ltd. (Contact Person: Tom Gunnersen's tel # is +852 3919 2561) in respect of any matters arising from, or in connection with, the research.

Additional information is available on request.