April 2019

CORPORATE OVERVIEW

NASDAQ: GLYC

Innovation Today, Healing Tomorrow.

GlycoMimetics, Inc.

Forward-Looking Statements

To the extent that statements contained in this presentation are not descriptions of historical facts regarding GlycoMimetics, Inc. ("GlycoMimetics," "we," "us," or "our"), they are forward-looking statements reflecting management's current beliefs and expectations. Forward-looking statements are subject to known and unknown risks, uncertainties, and other factors that may cause our or our industry's actual results, levels of activity, performance, or achievements to be materially different from those anticipated by such statements. You can identify forward-looking statements by terminology such as "may," "will," "should," "expects," "plans," "anticipates," "believes," "estimates," "predicts," "potential," "intends," or "continue," or the negative of these terms or other comparable terminology. Forward-looking statements contained in this presentation include, but are not limited to, statements regarding: (i) the expected timing of completion and data readout of the ongoing Phase 3 clinical trial of Rivipansel by Pfizer Inc. (ii) the timing of receipt of clinical data for our drug candidates; (iii) our expectations regarding the potential safety, efficacy, or clinical utility of our drug candidates; (iv) the size of patient populations targeted by drug candidates we or our collaborators develop and market adoption of our potential drugs by physicians and patients; (v) the likelihood and timing of regulatory filings and approvals; and (vi) our cash needs and expected cash runway, as well as potential royalties and milestone payments under license and collaboration agreements.

Various factors may cause differences between our expectations and actual results, including unexpected safety or efficacy data, unexpected side effects observed during preclinical studies or in clinical trials, lower than expected enrollment rates in clinical trials, changes in expected or existing competition, changes in the regulatory environment for our drug candidates, failure of our collaborators to support or advance our collaborations or drug candidates, our need for future capital, the inability to protect our intellectual property, and the risk that we become a party to unexpected litigation or other disputes. For a further description of the risks associated with forward-looking statements, as well as other risks facing GlycoMimetics, please see the risk factors described in the Company's Annual Report on Form 10-K filed with the U.S. Securities and Exchange Commission on March 6, 2019, as well as other reports we file with the U.S. Securities and Exchange Commission from time to time, including those factors discussed under the caption "Risk Factors" in such filings. Forward-looking statements speak only as of the date of this presentation, and GlycoMimetics undertakes no obligation to update or revise these statements, except as may be required by law.

Maturing Clinical Pipeline with Near-Term Catalysts

- **Rivipansel Phase 3 enrollment nearly complete data expected Mid 2019: Vaso-occlusive crisis**
  - Robust Phase 2 results across all endpoints
  - Collaboration agreement with Pfizer
  - Pfizer projects "potential blockbuster" (possible peak sales > $1B)
  - Significant GLYC milestones; royalties from low double digit to low teens
- **Enrolling uproleselan Phase 3: R/R acute myeloid leukemia**
  - Breakthrough Therapy Designation granted in May 2017
  - Targeting top-line data 4Q 2020
  - IP through 2032 in US, EU and Japan
- **Uproleselan market expansion via two consortia-funded trials: NCI and HOVON**
  - Strong, independent KOL support in newly-diagnosed AML settings (fit and unfit)
- **Strong balance sheet; funded through multiple catalysts / milestones**
  - Dec 31, 2018 cash balance ~$210 million
- **Well positioned to drive value creation**
  - Pipeline of potentially 'game-changing' therapeutic opportunities

Rivipansel (GMI-1070) for Sickle Cell Crisis

Phase 3 Readout Expected Mid 2019

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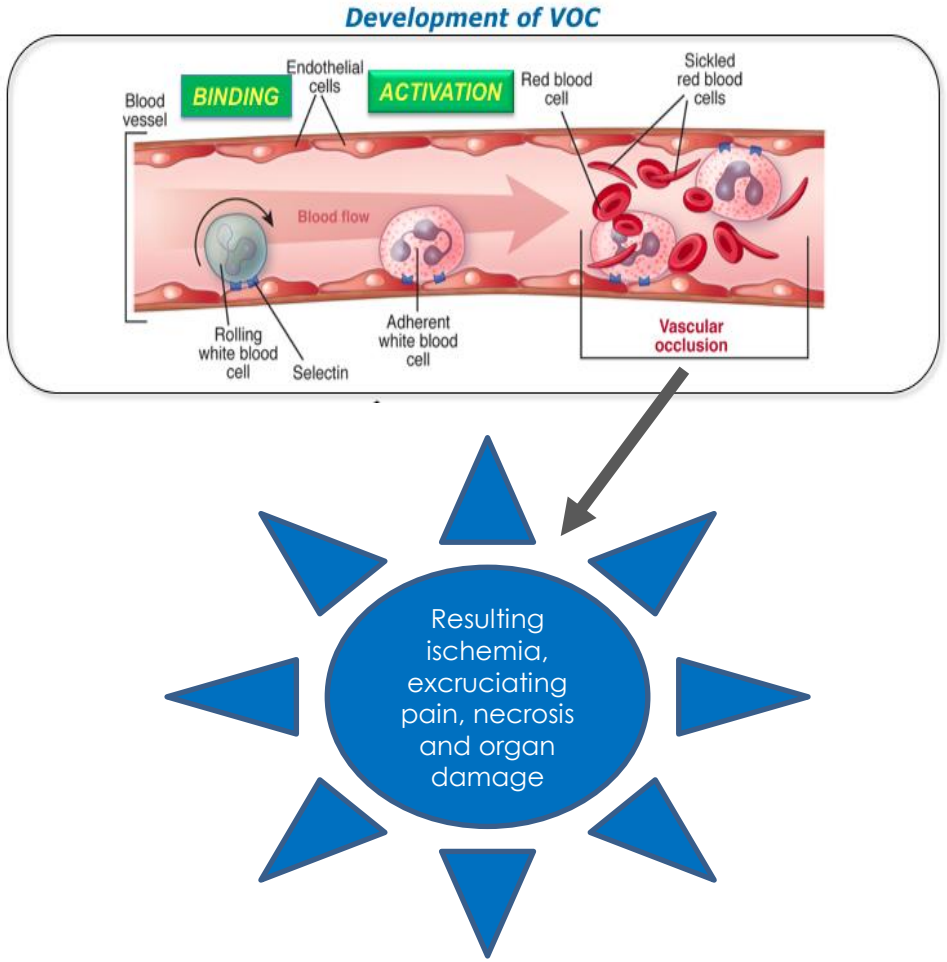
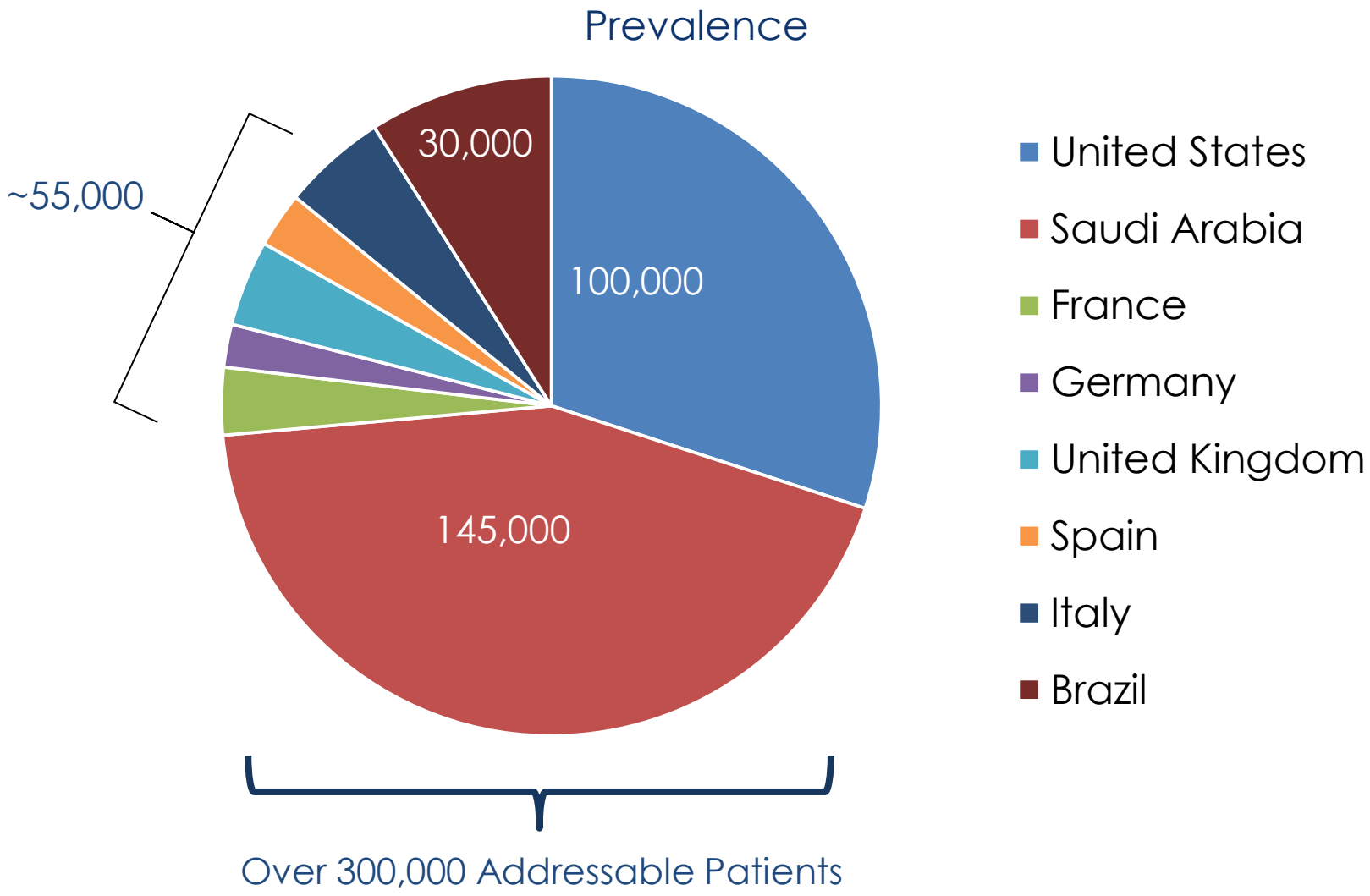
Sickle Cell Vaso-Occlusive Crisis and Rivipansel Mechanism of Action



- Sickled red blood cells (SS-RBCs), hypoxia and other pro-inflammatory factors induce selectins (adhesion molecules)
- Selectins bind inflammatory cells to the endothelium; activate leukocytes, trap circulating SS-RBCs; create VOC
- Rivipansel selectively targets underlying pathophysiology
  - Pan-selectin antagonist
  - Disrupts tethering and activation of adherent cells to the endothelium
  - Restores normal blood flow to alleviate VOC

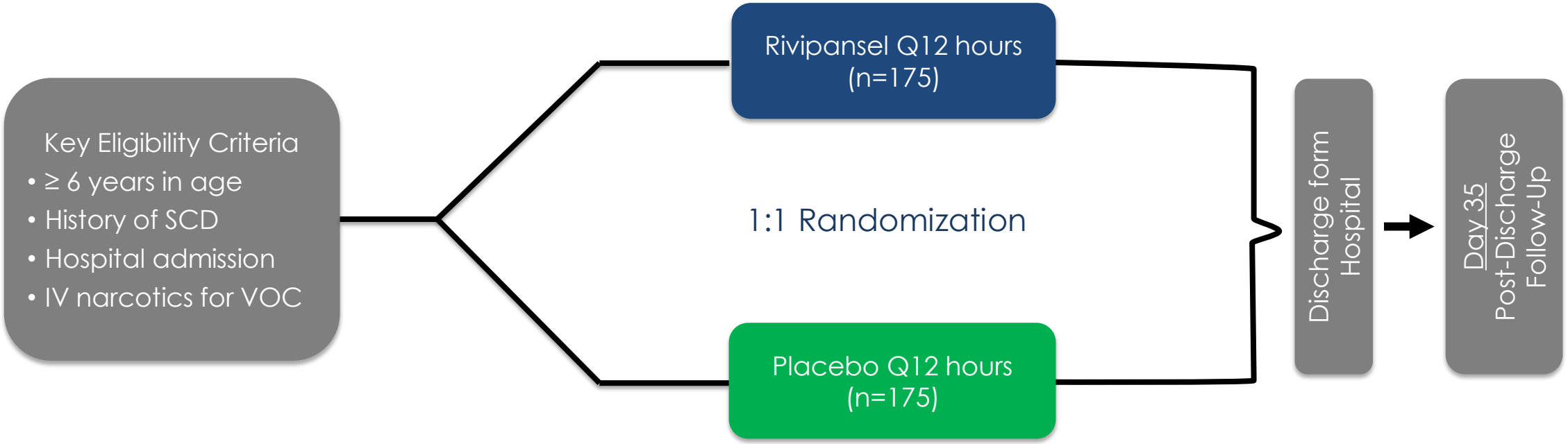
(1) Hassell KL. (2010) Am J Prev Med.;38(4 Suppl):S512-21
(2) Brousseau D et. al. (2010) Am J Hematol. 85(1) 77-8

Prevalence of Sickle Cell Disease in Major Markets



Source: WHO, http://www.who.int/mediacentre/factsheets/fs308/en; CDC, http://www.cdc.gov/ncbddd/sicklecell/data.html, Accessed May 2016. Brousseau et al. *The number of people with sickle cell disease in the United States: national and state estimate*, 2010.; Lucas et al. *NCEPOD report, 2008.* Gluckman et al. *International Sickle Cell Disease Observatory*, 2010; Kunz et al. *Significant prevalence of sickle cell disease in Southwest Germany,* 2016; Grosse et al. *The Prevalence of Sickle Cell Disease and its Implication for Newborn Screening in Germany*, 2016; Lobitz et al. *Incidence of sickle cell disease in Berlin, Germany*, 2014; Bardakdijan et al. *Neonatal Screening for sickle cell disease in France*, 2009; Colombatti er al. *Organizing national responses for rare blood disorders in Italy*, 2013; AlJuburi et al. *Trends in hospital admissions for sickle cell disease*, 2010; Kingdom of Saudi Arabi Ministry of Health Announcement as part of World Sickle Cell Day June 26, 2015; REDS III International Program – Brazil (Version 2018-01-18 Final)

Rivipansel Phase 3 “RESET” Study Design



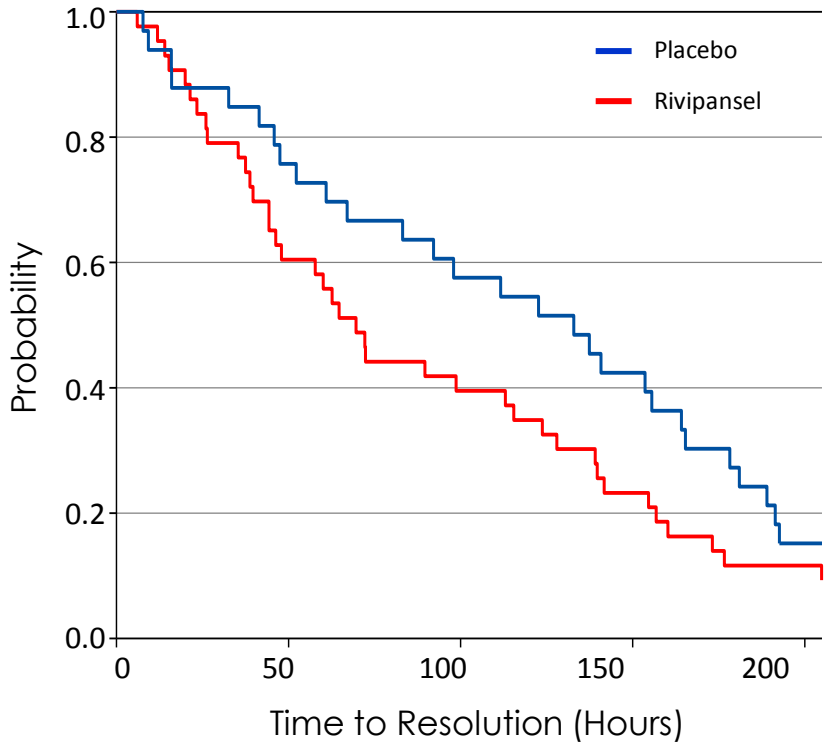
Primary Endpoint: Time to Readiness-for-Discharge
(calculated from first administration of study drug)

High Confidence in Rivipansel "RESET" Phase 3 Opportunity

- Selectins have been clinically-validated as targets for inhibition
  - GlycoMimetics' randomized Phase 2 trial of Rivipansel – Best of ASH
  - Selexys randomized Phase 2 of SelG1 (p-selectin antibody) - ASH Plenary Session
  - GBT license of Inclacumab (p-selectin antibody)
- Phase 3 primary endpoint modelled on Phase 2 data
  - Simple checklist; more rigorous evaluation (q4 waking-hrs)
- Well powered: more than four times size of Phase 2
- Special Protocol Assessment (SPA) in effect with FDA
  - Only Sickle Cell program to have a SPA

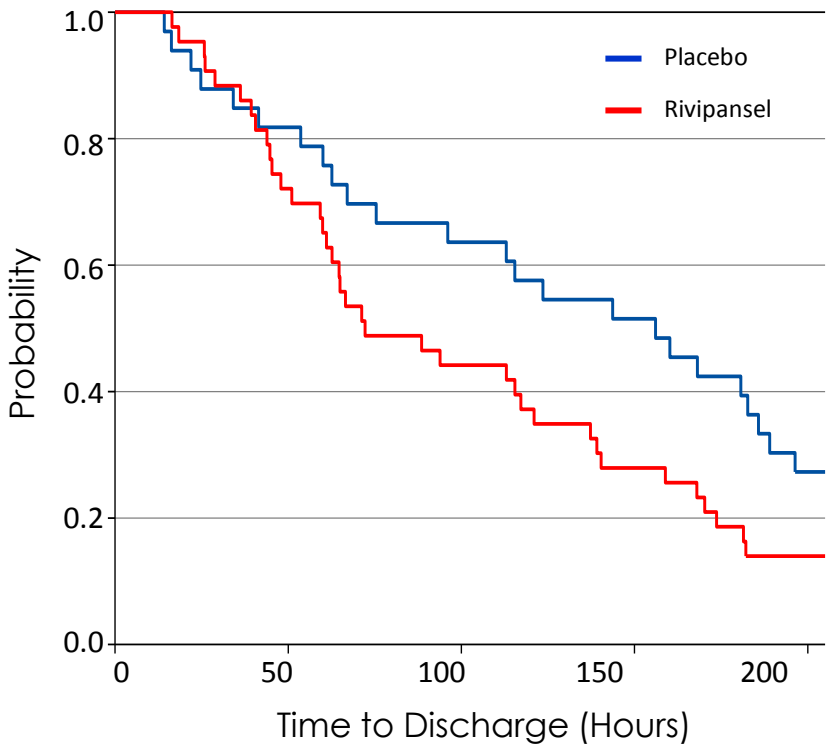
Rivipansel Phase 2 Results – Substantial Improvements Observed Across Clinically Relevant Endpoints

Time to Resolution of VOC



Median time to resolution of VOC **reduced by 63 hours** (p=0.187; Kaplan-Meier)

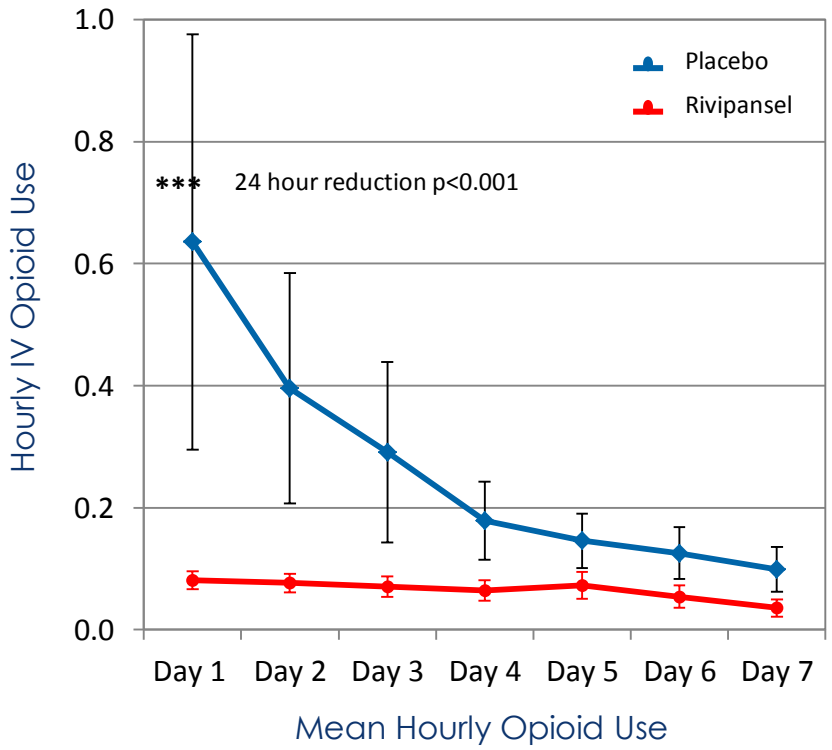
Time to Discharge From Hospital



Median time to discharge **reduced by 84 hours** (p=0.092; Kaplan-Meier)

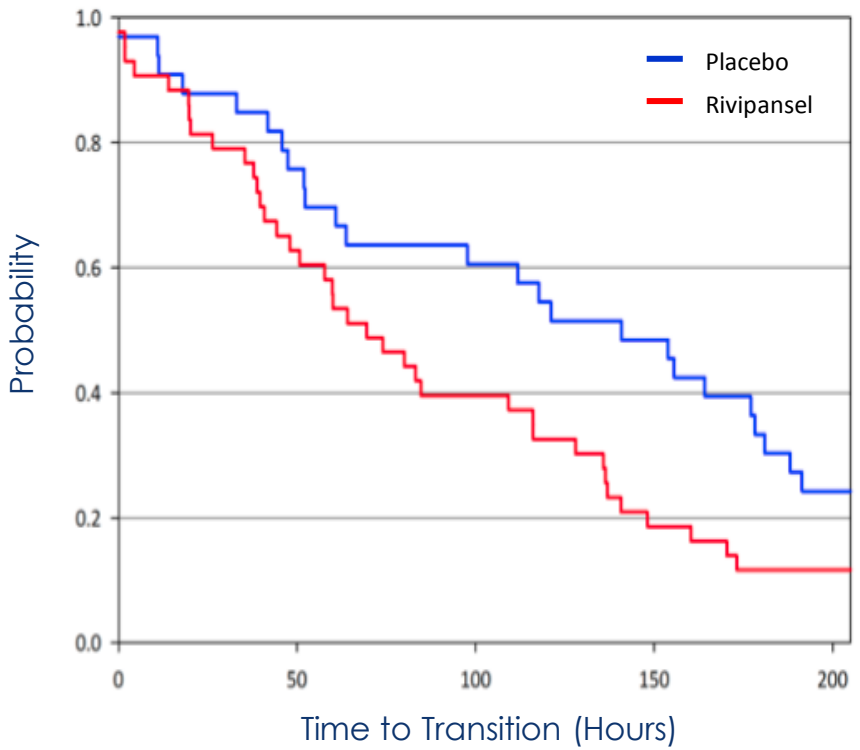
Rivipansel Phase 2 Results – Dramatic Reduction in Opioid Use

Opioid Use Over Time



Cumulative opioid analgesic administered **reduced by 83%** (p=0.010)

Time to Transition to Oral Analgesics



Median time to transition to oral pain meds **reduced by 76 hours** (p=0.089; Kaplan-Meier)

Rivipansel Market Expansion Potential

Progression of a Vaso-Occlusive Crisis (VOC)

	Prodrome	**Moderate-Severe Pain**		**Uncontrollable Pain and Other Complications**
	0-6 hours	*2-24 hours*		*12 hours - 5+ days*
Setting of Care	**Home**	**Outpatient Setting**	**Emergency Department**	**Inpatient Hospital**
Potential Use of Rivipansel	--	Use in patients "destined for admission" to abort VOC episode, prevent organ damage, obviate need for hospitalization		Initial Indication
	--	**~150,000 Events/Year** [3]		**>100,000 Inpatient Stays/Year** [1,2]

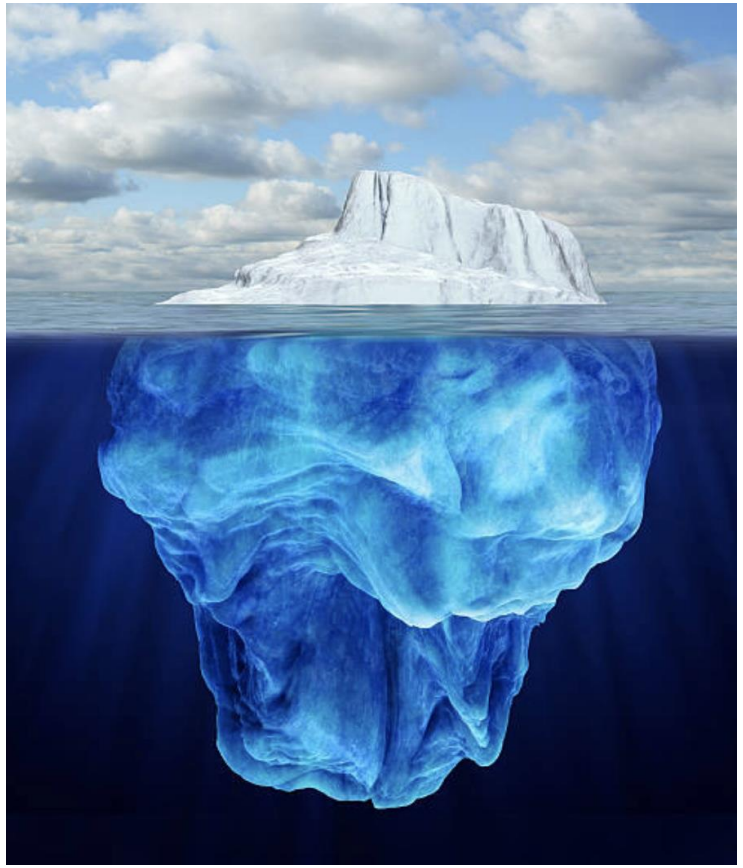
Life cycle opportunity: Outpatient & Emergency Rooms

- Aborting crises: Potentially preserving organ function; reducing hospitalizations
- "On-demand" agent addresses historical noncompliance issues associated with chronic, prophylactic therapies

(1) Hassell KL. (2010) Am J Prev Med.;38(4 Suppl):S512-21, Brousseau D et. al. (2010) Am J Hematol. 85(1) 77-8, Yusuf HR et. al. (2010) Am J Prev Med. 38(4 0)

VOC Treatment Data Most Likely Under-Represents Need

- Lack of available care, other than opioids and other supportive measures
- ER attitudes = barrier to care
  - Patients sometimes thought to be "drug-seeking"
  - SCD patients wait 60% longer for pain meds than other patients
- Only 20% of family physicians report feeling comfortable treating patients with SCD



Frieirmuth et. Al Adv Emerg Nurs J. (2015); Arch et. Al, Anemia 2015; Haywood et. Al 2013

Rivipansel: Attractive Commercial Opportunity

- High unmet need, unlikely to change in future
  - Pan-selectin antagonist designed to halt physiology driving VOC
- Only "on-demand" treatment in development
  - Potential to rapidly become standard of care for VOC
- Similar treatment patterns in US, EU and other markets
  - Global commercial alignment
- Concentrated target audience
  - Commercialization with small, focused sales infrastructure
- Global market opportunity is sizeable
  - Pfizer "blockbuster" projection (>$1B US)

Pfizer Partnership - Near Term Economics

Rights	Pfizer responsible for all further clinical development, regulatory approval and commercialization for all indications worldwide
Upcoming Milestones	Regulatory: Up to $70.0 million possible: • Next milestones – Acceptance of NDA – Acceptance of filing by EMA Development: Up to $80 million possible remaining: • Next milestones – First commercial sale in US – First commercial sale in Europe Commercial: Up to $135.0 million possible
Royalties	Tiered, ranging from low double digits to low teens

Uproleselan (GMI-1271)

Breakthrough Therapy Designation
Significant Market Opportunity

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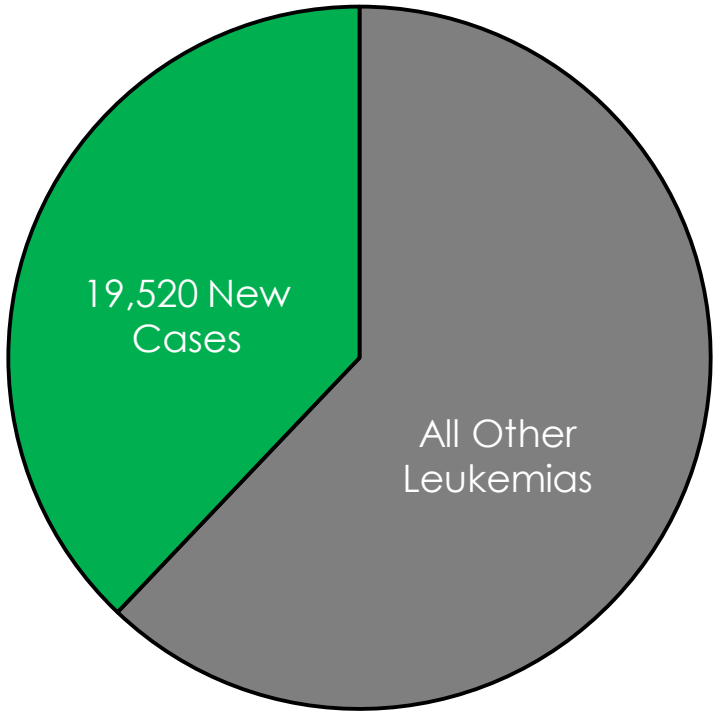
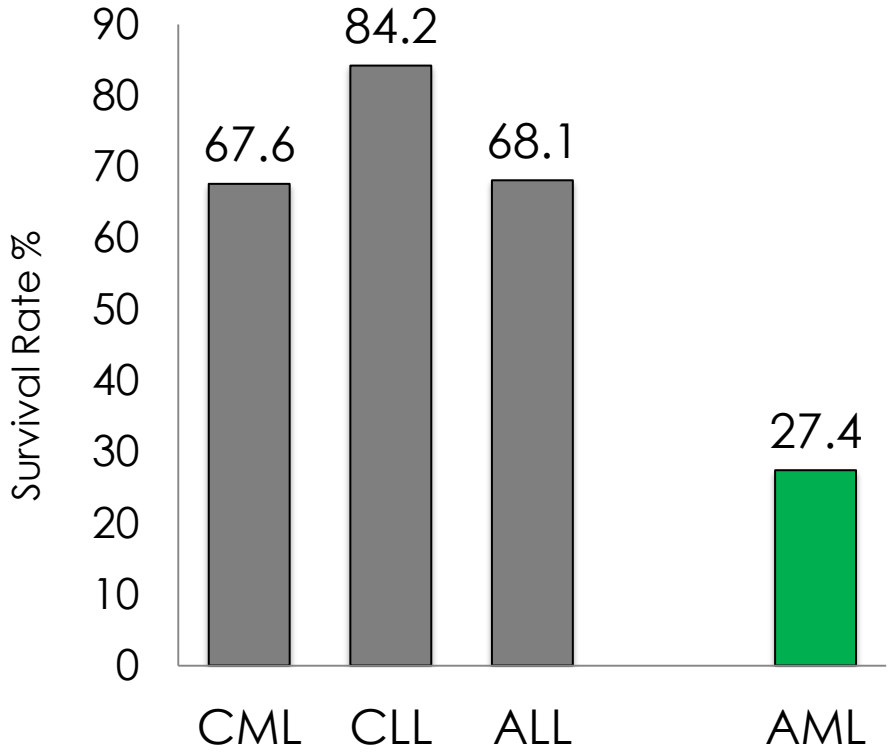
Significant Unmet Need in AML
Highest Incidence, Lowest 5-yr Survival of all Leukemias

Estimated New Cases
(2018)

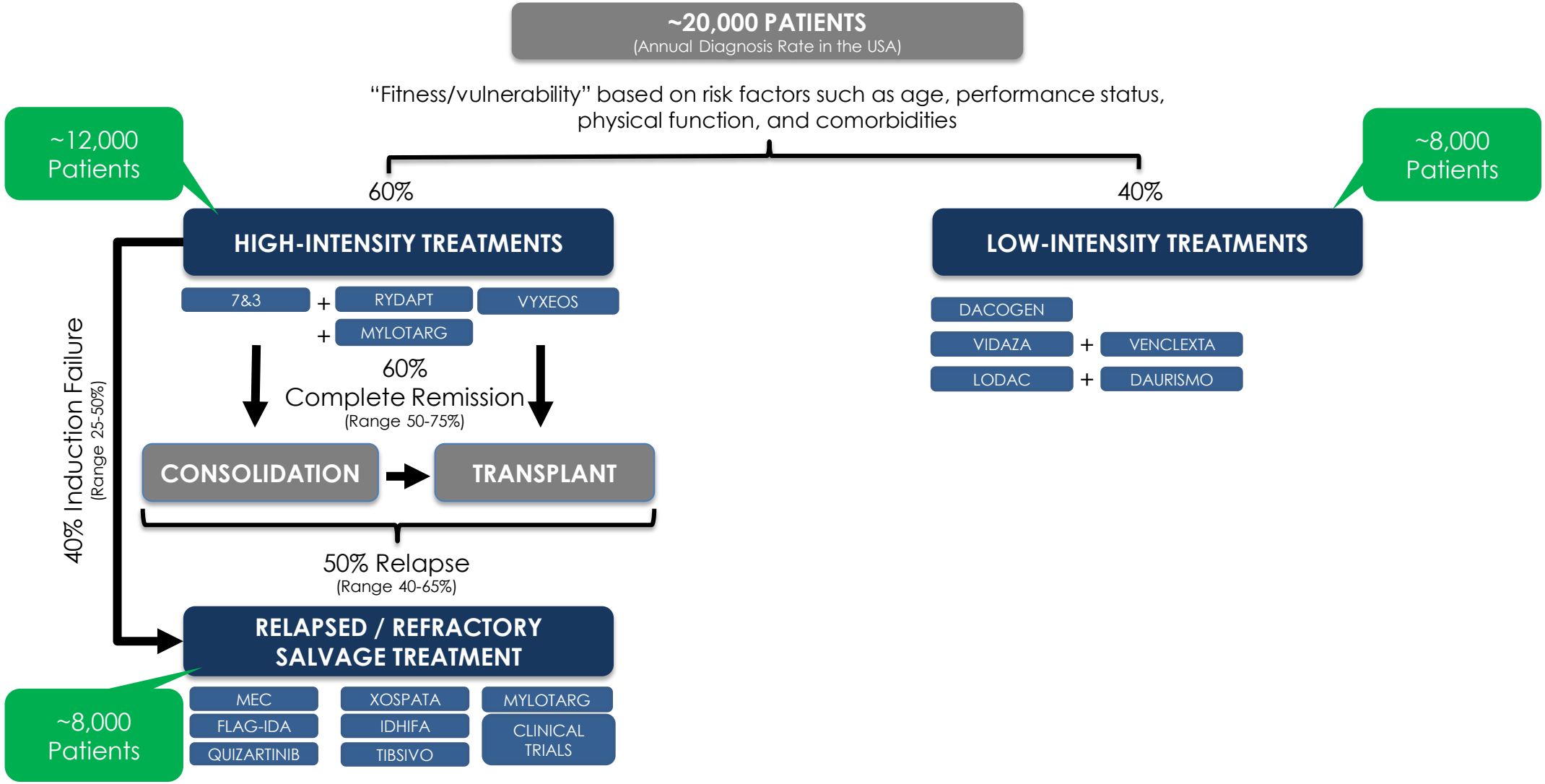


5-Year Survival
(2008 – 2014)



SEER 2018 Statistics

AML Treatment Landscape



SEER 2018
NCCN Guidelines AML 2018
GMI Internal Assessment

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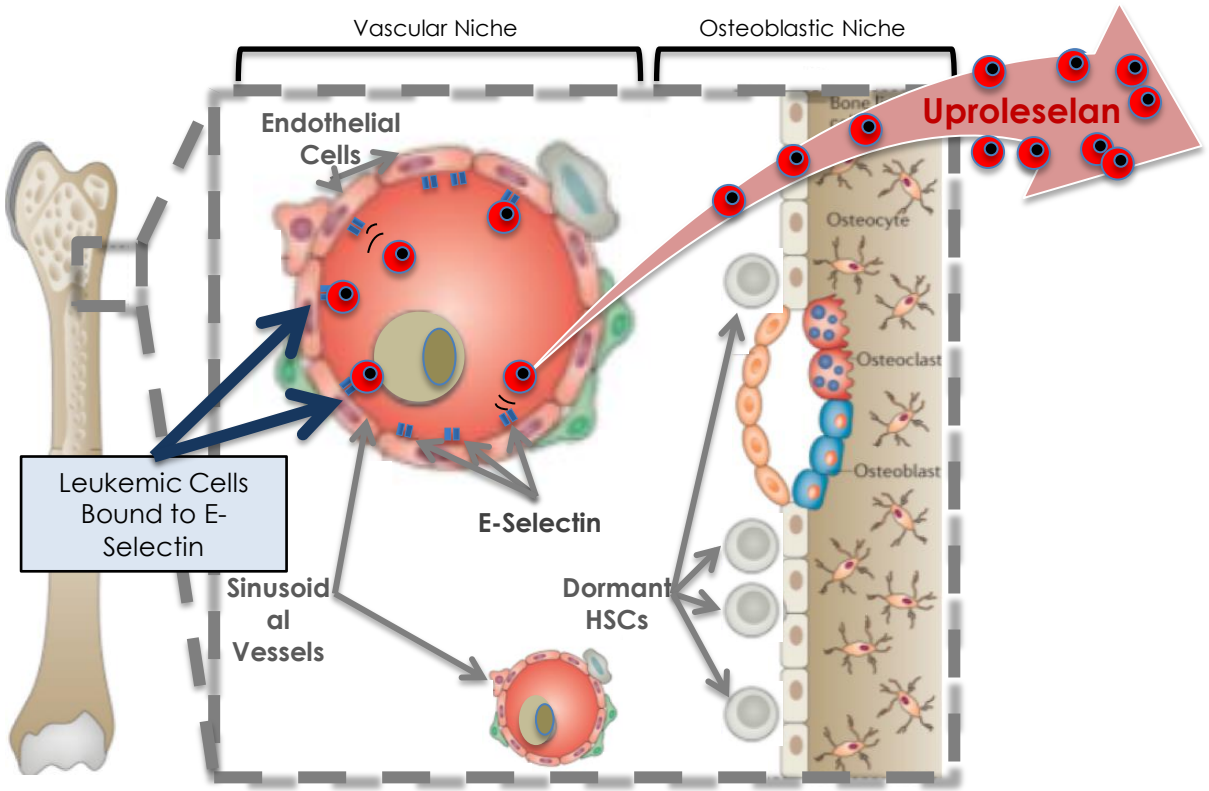
Uproleselan Mechanism of Action

E-selectin:

- Is constitutively expressed in the bone marrow microvasculature,levels up-regulated in AML
- Binds to the E-selectin ligand expressed on AML cells to activate pathways for chemoresistance



In preclinical models:

- Prevents trafficking of tumor cells to the bone marrow
- Disrupts cell adhesion-mediated drug resistance (CAMDR) within bone marrow microenvironment
- Inhibits activation of cancer survival pathways (e.g. NF-kB)
- Protects normal HSCs by enhancing quiescence and ability for self-renewal
- Reduces chemotherapy-associated toxicity (e.g. severe mucositis)

Uproleselan disrupts the interaction between AML cells and the bone marrow microenvironment

E-Selectin Ligand Expression On Leukemic Blasts Is Associated with Poor Prognosis in Patients with AML

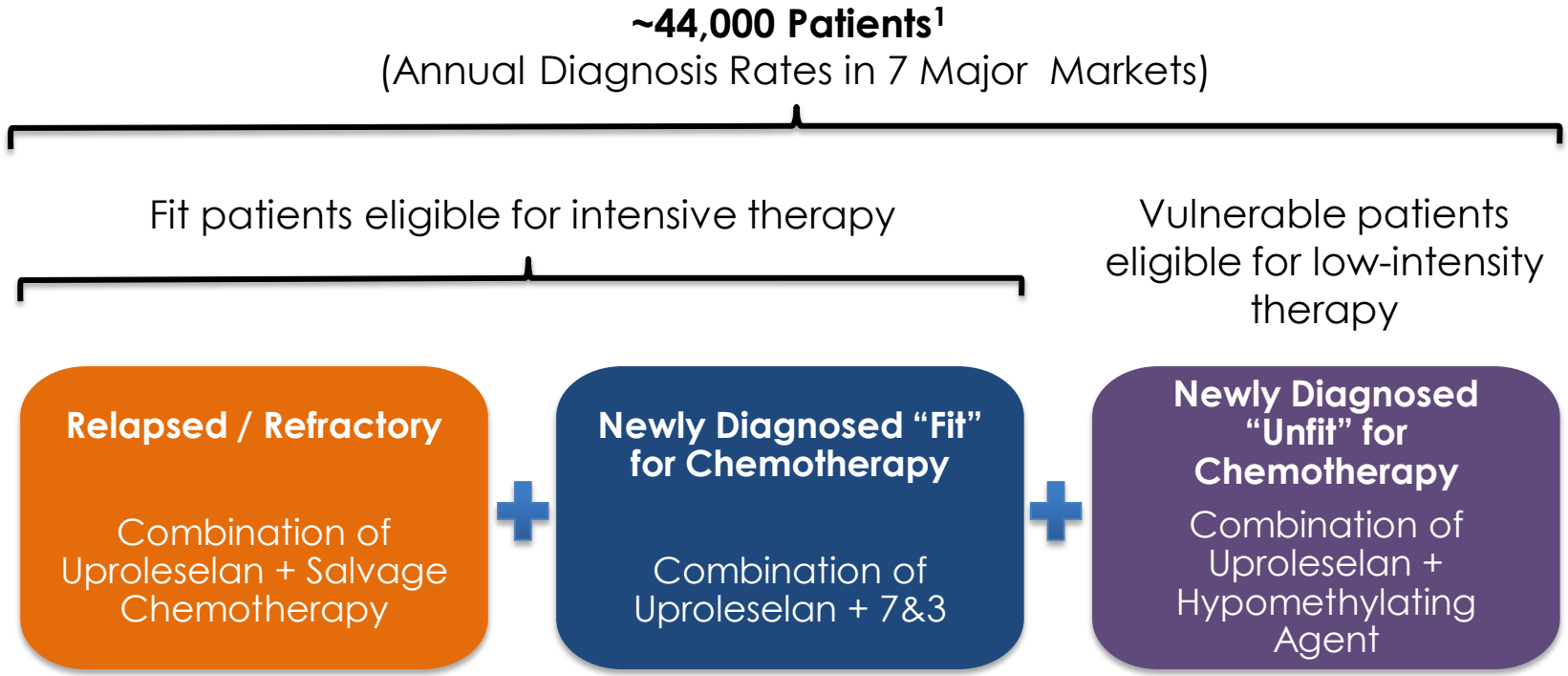
Independent Data from 89 Serially Acquired AML Patient Samples

- Mean fluorescence intensity of E-selectin-Fc binding is 4-fold higher for relapsed/refractory patients than for newly diagnosed patients (p=0.0026)
- Percent E-selectin-Fc binding is higher in patients with unfavorable than favorable/intermediate risk (p=0.019)
- Expression of E-selectin ligands by leukemic stem cells is tightly correlated with expression in leukemic blasts in the same patient

Higher E-selectin ligand expression is associated with chemotherapy resistance and AML persistence

Uproleselan: Positioning Across AML Spectrum of Care

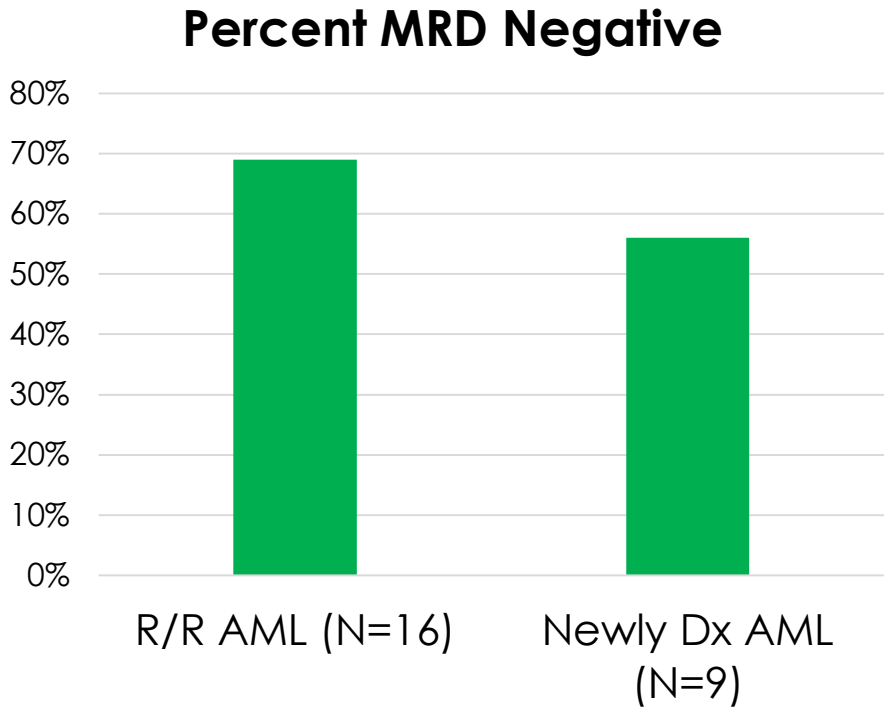
- Potential foundational backbone treatment to extend survival
- Goal to enhance achievement/durability of complete remission; reduce treatment-related morbidity and mortality
- Potential synergy with ablative, non-ablative and targeted therapeutics



[1] GlobalData AML Opportunity Analysis and Forecast Report published in 2016

Final Efficacy/Correlative Results: Upro Phase 1/2 Oral Presentation at ASH

- R/R AML Cohort: 41% CR/CRi; 8.8 mos. Median Overall Survival
- Newly Diagnosed AML Cohort: 72% CR/CRi; 9.2 mos. Event Free Survival
- >50% of evaluable patients archived a stringent MRD-negativity
  - Appears to enhance depth of response
- E-selectin ligand expression
  - Detectable in every patient tested; target biologically relevant
  - Higher in those R/R patients achieving CR/CRi, MRD- and prolonged median OS

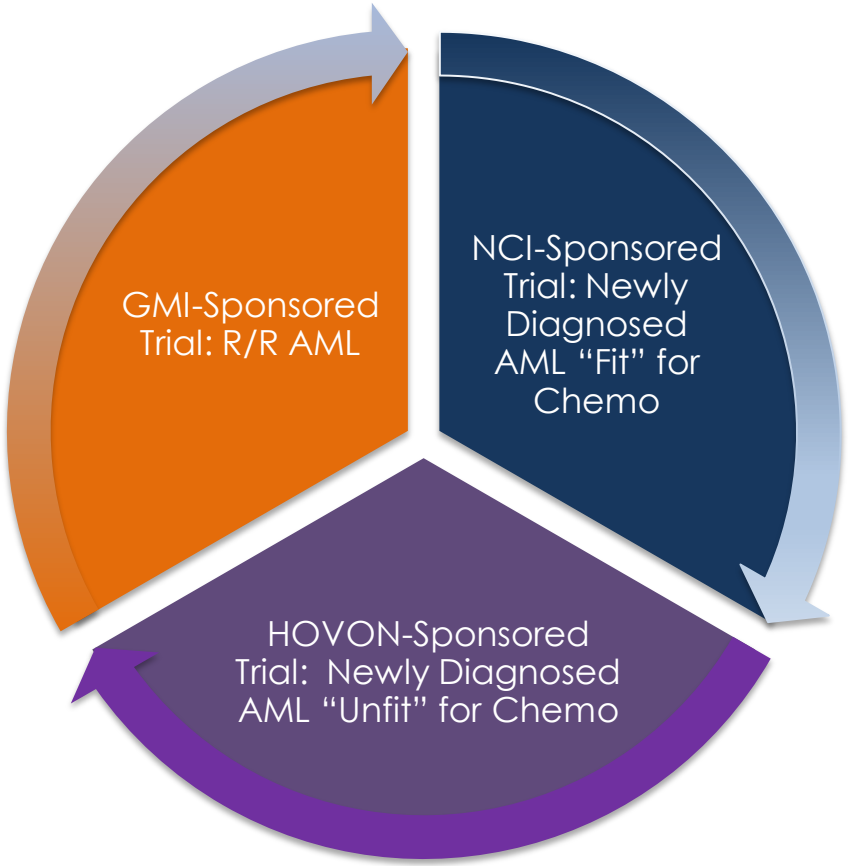


Data supports biological/clinical framework underpinning the late-stage registration program with uproleselan

Historical Benchmarks - What Are We Trying to Beat?

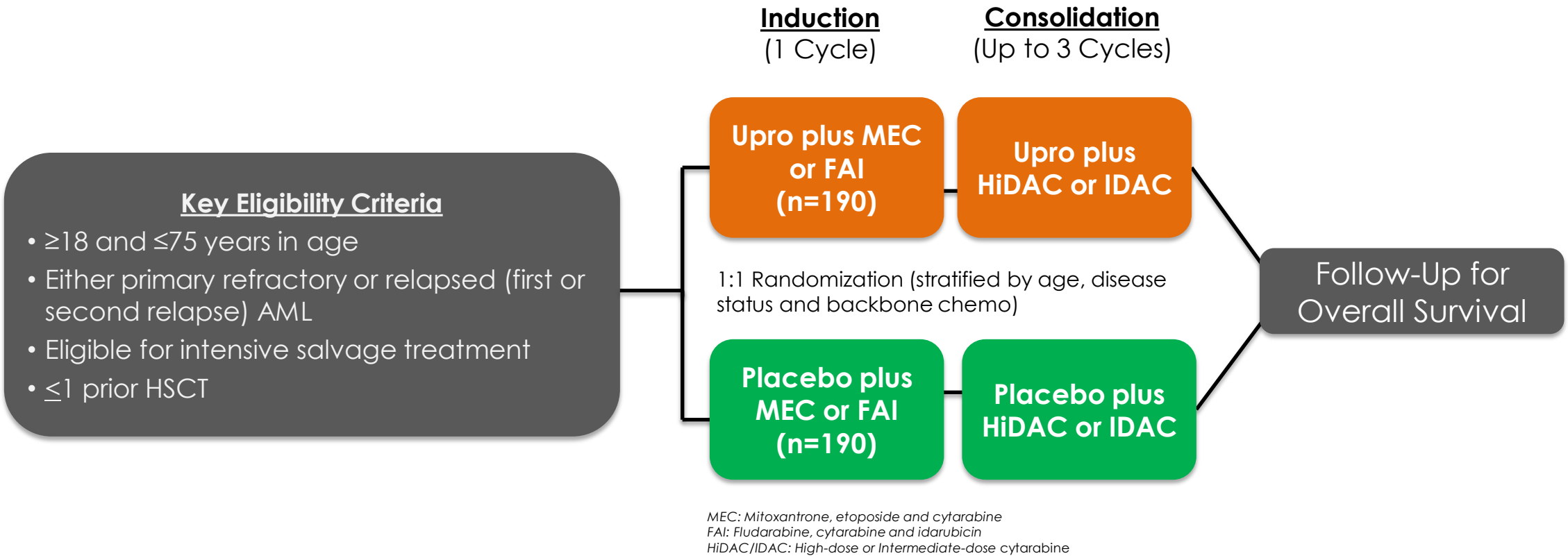
Population	Phase 2/3 Primary Outcome Measure	Uproleselan Phase 1/2 Results	Historical Comparitors		
			Publication	Design	Result
Relapsed / Refractory AML	Overall Survival (months)	8.8 months	Greenberg et al (2004)	Valspodar + MEC vs. MEC	5.4 months (MEC)
			Feldman et al (2005)	Lintuzumab + MEC vs. MEC	5.2 months (MEC)
			Roboz et al (2014)	Elcytarabine vs. Inv. choice	3.4 months (Inv. choice)
Newly Dx "Fit" for Intensive Chemo AML	Event-Free Survival (months)	9.2 months	Lowenberg et al (2009)	7+3	~6.5 months
			Lancet et al (2014)	Vyxeos vs. 7+3	2.0 months (7+3)

Uproleselan Comprehensive Development Approach in AML



Differentiated Clinical Strategy;
Partnered with Leading US/EU Heme-Onc Consortia to Expand Utility

Uproleselan Relapsed / Refractory AML Phase 3 Study Design



Phase III Primary Endpoint: Overall Survival, defined as the time of randomization until death from any cause – analysis of OS will not be censored for transplant

Positioned for Success

Pipeline, Progress, Catalysts

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A Portfolio of Exciting Product Candidates

Drug Candidate	Indication	Discovery	Pre-Clinical	Phase 1	Phase 2	Phase 3	Registration	Partner
Selectins								
Rivipansel. (Pan-selectin inhibitor)	*SCD Vaso-occlusive Crisis*							**Pfizer**
Uproleselan (GMI-1271) & Follow-on E-selectin inhibitor	*Relapsed / Refractory AML*							-----
	Newly Dx "Fit" AML							-----
	Newly Dx "Unfit" AML							-----
	Hem-Onc & Inflammatory							-----
GMI-1359 (E-selectin/CXCR4 Inhibitor)	*Various Tumor Types*							-----
Galectins								
GMI-1757 (Galectin-3/E-selectin inhibitor)	*Hem-Onc & Inflammatory*							-----
Galectin-3 inhibitor	*Fibrosis & Oncology*							-----

Q2’19 Anticipated Announcements

- First patient enrolled, Uproleselan NCI-sponsored pivotal trial
  - Study has been activated by NCI
- First patient enrolled, Uproleselan HOVON-sponsored trial
- Rivipansel enrollment completion
  - Topline data Mid-2019

Investment Opportunity – Nasdaq: GLYC

Advancing Pipeline	• Rivipansel: Only "on-demand" treatment in Phase 3 trial for acute VOC, top line data read-out mid 2019 • GMI-1271: BTD from FDA, registration program initiated 2018 • GMI-1359: Simultaneous blockade of CXCR4 & E-Selectin targets enhancing anti tumor immune response
Significant Revenue Opportunities	• Rivipansel: ~100,000 patients in USA, Pfizer projects "Potential Blockbuster" • GMI-1271: > 44,000 AML patients in 7 major markets
Strong Investment Base	• Top-tier biotech investors • Cash balance of ~$210 million as of December 31, 2018
Experienced Team	• Pioneers in the field of glycobiology and small-molecule, therapeutic "mimetics" • Relationships with leading KOLs and oncology networks

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