MOLECULIN

April 2026
Corporate Presentation

Disclaimer

All statements contained herein other than statements of historical fact, including statements regarding our future results of operations and financial position, our business strategy and plans, and our objectives for future operations, are forward-looking statements. The words “believe,” “may,” “will,” “estimate,” “continue,” “anticipate,” “intend,” “expect,” and similar expressions are intended to identify forward-looking statements. We have based these forward-looking statements largely on our current expectations and projections about future events and trends that we believe may affect our financial condition, results of operations, business strategy, short-term and long-term business operations and objectives, and financial needs. Our potential to sustain our relationship with MD Anderson revolves around the continued collaboration and capitalizing on intellectual property resulting from sponsored research. The feasibility and promptness of our clinical trials are influenced by regulatory stipulations from entities like the US Food & Drug Administration (FDA) and their global counterparts. As such, all of our trials, including the MIRACLE trial, are subject to timely, future filings with and feedback, allowance, approvals, etc. from the FDA and their global counterparts. The implications of global events, such as the conflict in Ukraine, the COVID-19 pandemic, and prevalent supply chain challenges, play a role in our forward-looking statements. We will require significant additional financing, for which we have no commitments, in order to conduct our clinical trials as described in this presentation, and the milestones described in this presentation assume our ability to secure such financing on a timely basis. Additionally, our ongoing need for securing regulatory approvals in essential markets, and sourcing cost-effective drug solutions are core to our forward-looking statements. Furthermore, our commitments concerning intellectual property licenses, the potential efficacy of our drug candidates, market reception, potential product liabilities, and the emerging competitive landscape are also fundamental to our forward-looking statements. Any reference related to cardiotoxicity or the lack thereof concerning Annamycin is based on our expert’s opinion as detailed in our filings, from time to time, with the SEC. Our dependencies on third-party manufacturers, strategies for establishing business collaborations, the defense of our intellectual property rights, our plans for fostering company growth, and the imperative to retain key executive personnel also guide our projections. It is not possible for our management to predict all risks, nor can we assess the impact of all factors on our business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those contained in any forward-looking statements we may make. In light of these risks, uncertainties, and assumptions, the future events and trends discussed in this presentation may not occur, and actual results could differ materially and adversely from those anticipated or implied in the forward-looking statements. More detailed information about Moleculin is set forth in our filings with the Securities and Exchange Commission. Investors and security holders are urged to read these documents free of charge on the SEC’s website at http://www.sec.gov. Data related to currently active trials of Moleculin are preliminary and subject to change until a final Clinical Study Report is published.

Our Team

Walter V. Klemp
Founder, President, CEO and Chairman

Donald Picker, PhD
Chief Scientific Officer

Jonathan P. Foster
Executive VP & Chief Financial Officer

Dr. John Paul Waymack
Senior Chief Medical Officer

Robert Shepard, MD, FACP
Medical Advisor

Adriano Treve
Strategic Advisor

7 FDA Approvals

2 Big Pharma Exits

18 Moleculin Clinical Trials

~$1 Million in Management Investment in MBRX

200 Years of Combined Drug Development Experience

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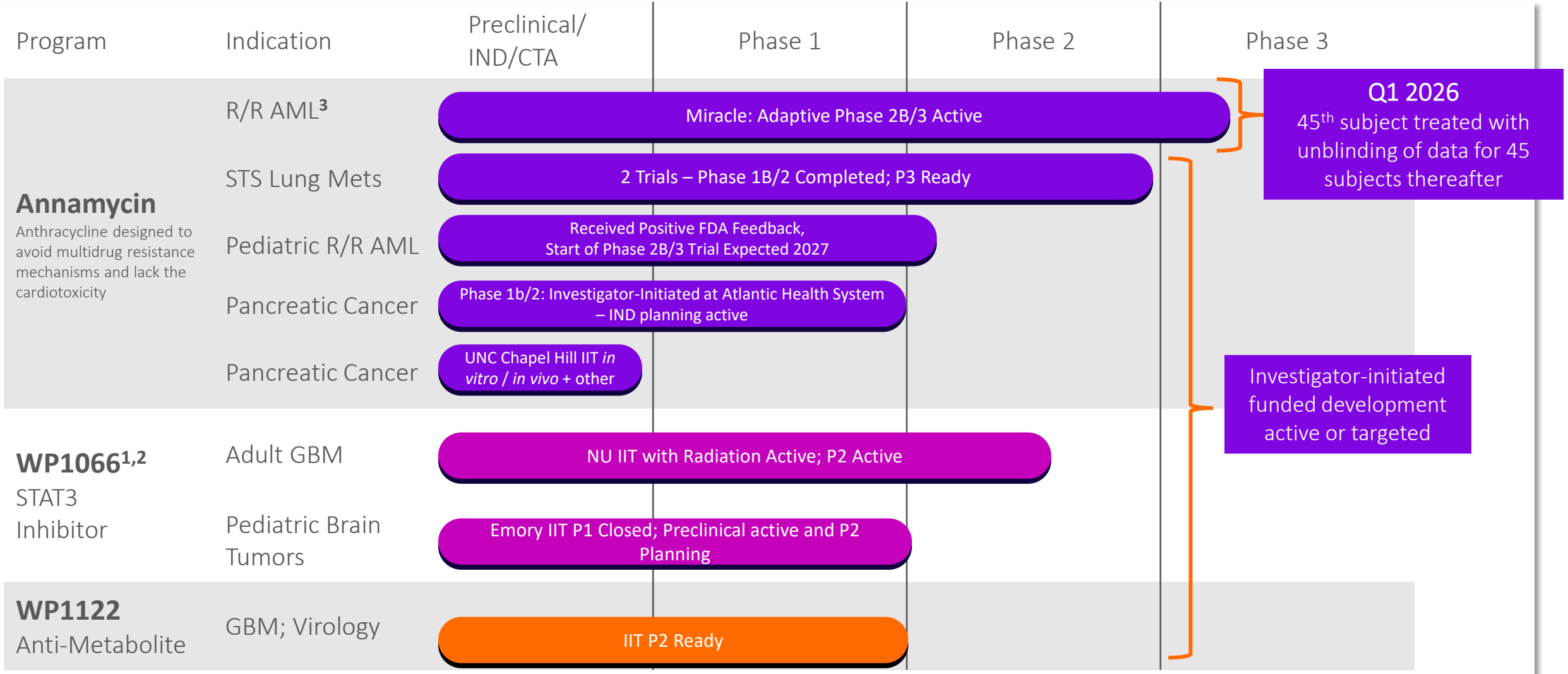
Technology Portfolio



1. This is the oral formulation. WP1066 IV formula has preclinical work being performed at Emory ITT. 2. Re-formulation of WP1066 studies are being performed at Emory. 3. 3L Adult AML clinical trial planned 2027
All technology derived from or jointly developed with MD Anderson Cancer Center (Houston)

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Opportunity for Market Cap Breakout

Annamycin:

- Disruptive Technology – Patented NCE with superior safety & efficacy serving huge unmet need; First ever non-cardiotoxic alternative; avoids resistance mechanisms; superior tissue/organ distribution; ODD & Fast Track status; Rare pediatric potential

- Clinically Advanced – Greater Phase 2 efficacy than any 2L AML therapy ever approved; Phase 3 Pivotal R/R AML trial underway with FDA guidance and low approval bar; two data readouts in 2026; Encouraging efficacy also seen in STS Phase 2 trial; Pancreatic cancer IIT beginning 2026

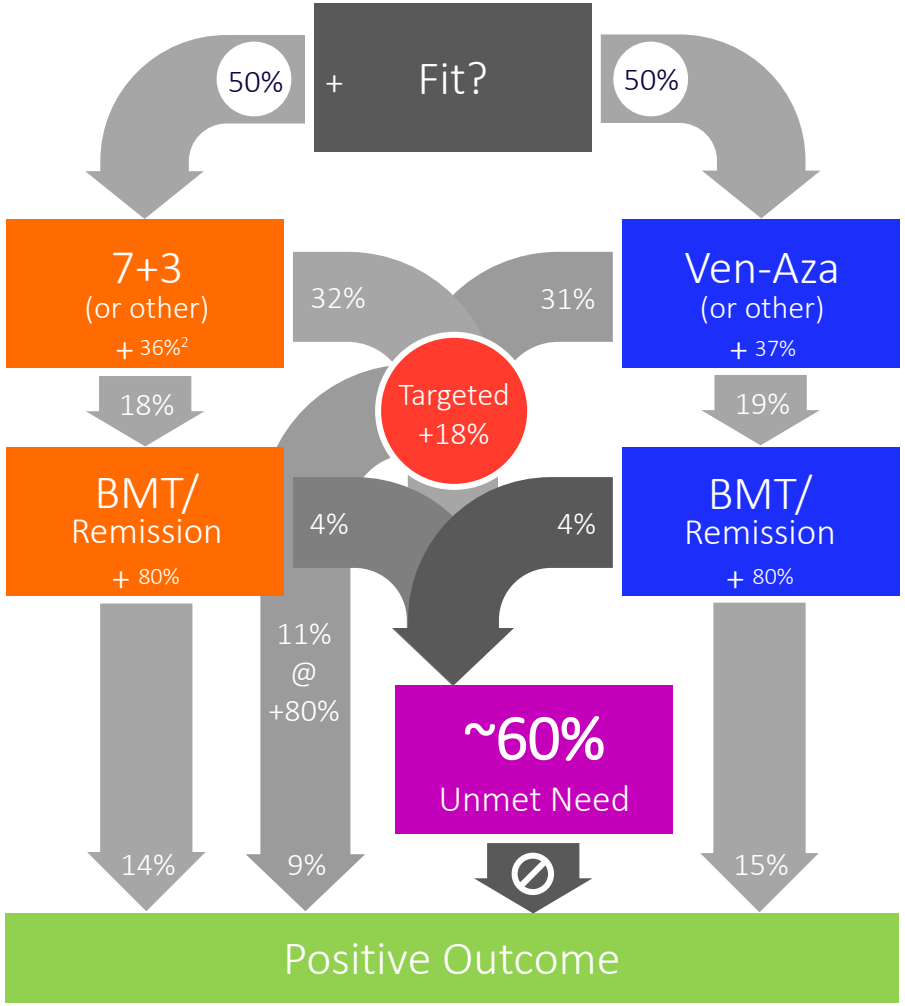
- Huge Market Potential – $1 billion market in AML alone; 10x growth potential in additional indications supported by Phase 1/2 or preclinical data

Diverse Pipeline – Additional oncology/viral drug candidates with successful Phase 1/2 trials being funded by investigator-initiated studies

Deep Management Bench – 200 years of biotech experience; multiple FDA approvals

Annamycin:
A New Disruptive Tool for Second Line AML and Beyond

Approved Therapies Leave an Unmet Need in ~60% of AML Patients[1]



	Daunorubicin (+ Ara-C)	Venetoclax (+ Azacitidine)	Targeted Therapy
Regimen	7+3	Ven-Aza	Gene-Targeted
Sub-population	Fit Patients (50%)	Unfit Elderly (50%)	55%-65% Eligible
Durable CR%	36%[2]	37%	~18%
All AML benefit[3]	14%	15%	9%
Critical characteristics	Cardiotox; de novo/acquired resistance	Still leaves significant unmet need	Limited to certain gene mutations

Notes: 1. Management estimates; 2. Net of relapse, Management estimate, varies depending on study; 3. % of AML population sustaining durable positive outcome via BMT or remission, allowance made for other therapies where appropriate in the percentages shown

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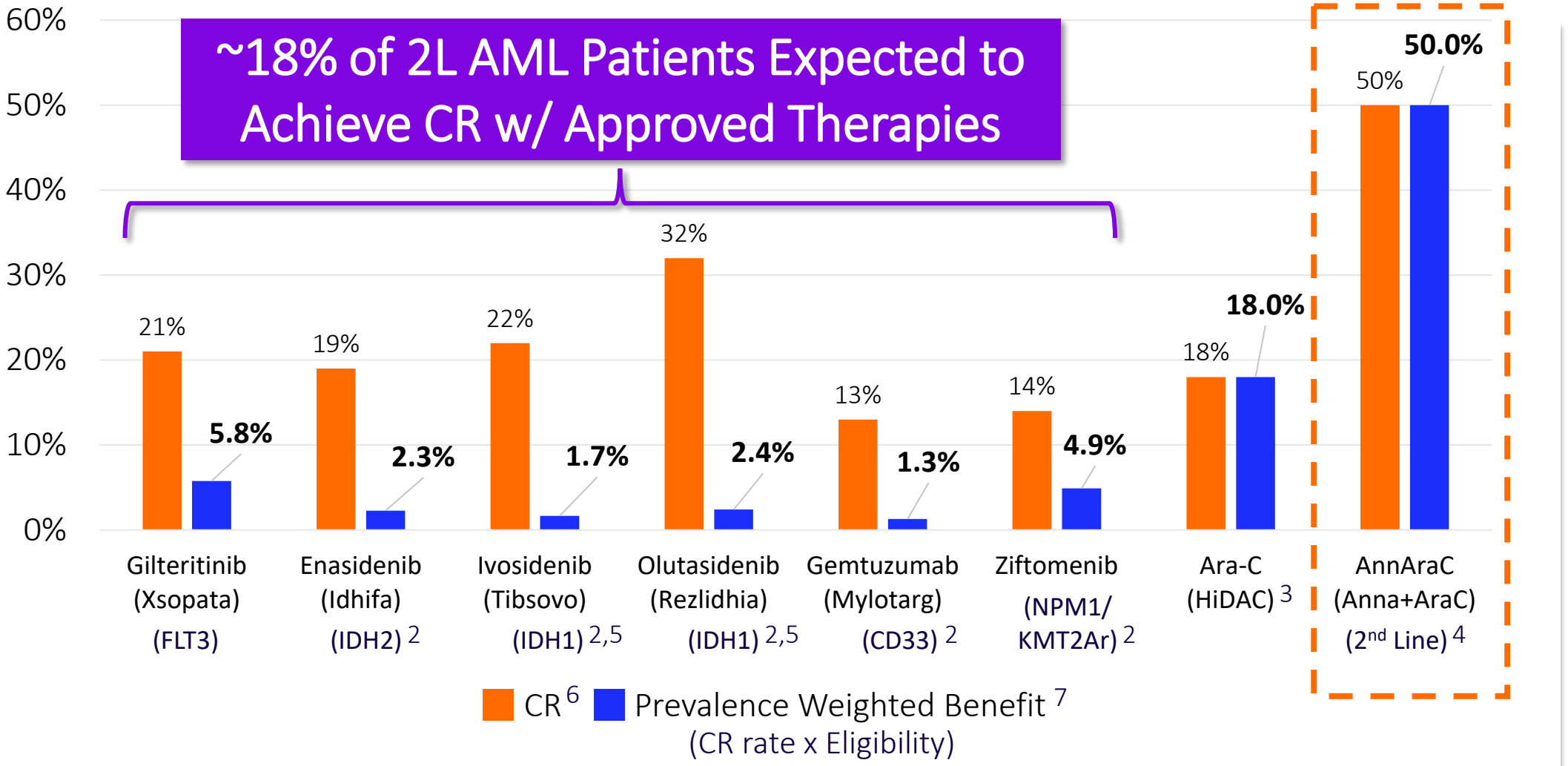
Annamycin Provided 2-Fold or Greater Efficacy Than Targeted Therapies[1]



See Appendix for Notes

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Anthracyclines: Ripe for Disruption

~50% of cancers are treated with an anthracycline

~60% of pediatric cancer treatments

65% of treatments > FDA limit result in heart damage

60% of childhood cancer survivors develop cardiac dysfunction

$1.5 billion paid for the last anthracycline improvement
(3.6 mo.>OS, no change in cardiotoxicity, 2016, AML only)

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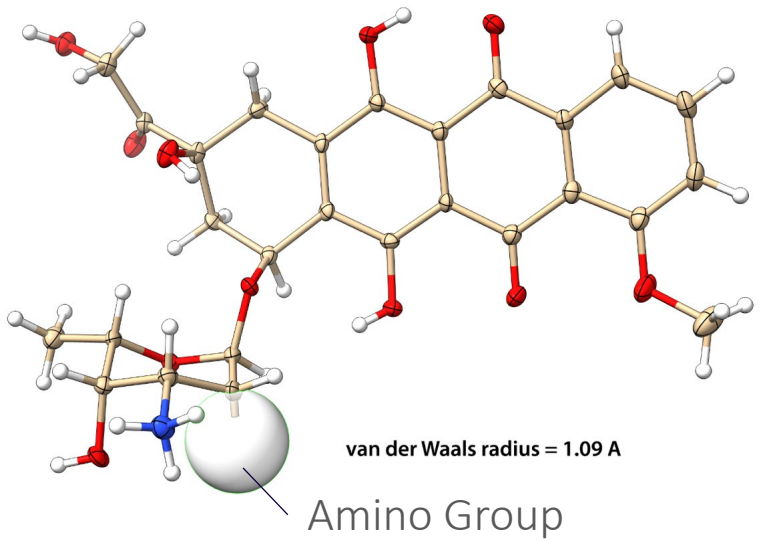
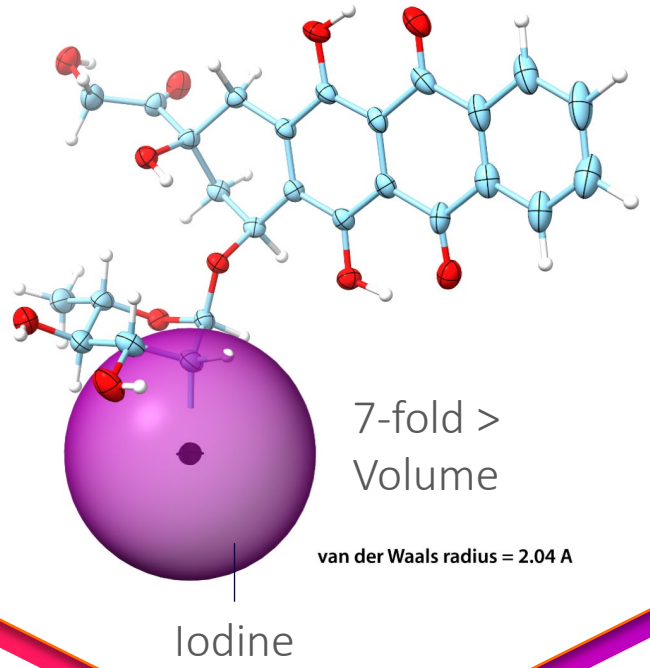
Major Structural Differences; Unique Lipid Delivery System

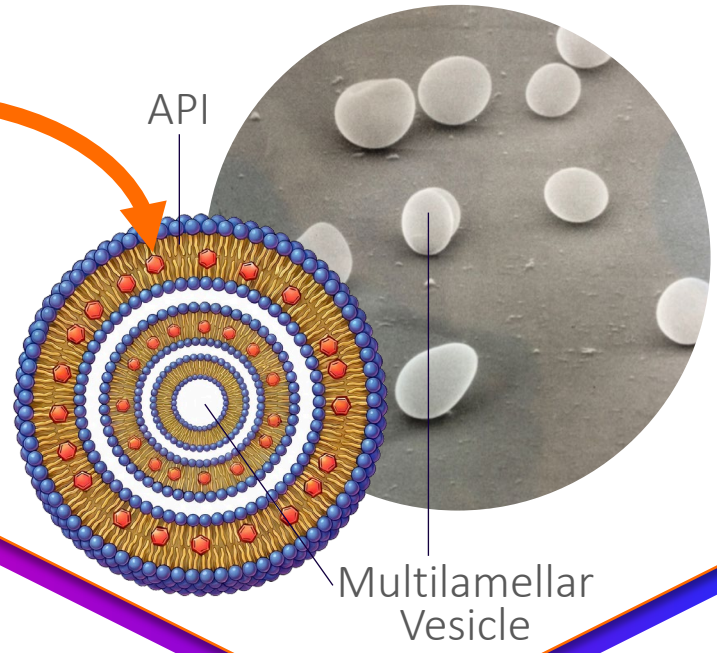
Doxorubicin



Annamycin



Liposomal Annamycin



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Annamycin: Disruptive Technology

Disruptive Technology – Novel anthracycline with major structural changes and novel lipid delivery system; Biggest advancement in history of anthracyclines

First Ever Non-Cardiotoxic Alternative – Zero cardiotoxicity seen in >100 subjects treated, most dosed over the lifetime maximum allowable limit (some up to 5x the limit); Data independently reviewed by Cleveland Clinic and FDA; allows treatment of otherwise unfit patients and expansion to consolidation and maintenance therapy

Greater Efficacy Than Any 2L AML Drug Approval – 60% CRc (50% CR) with DoR @ 13 months and OS @ 15+ months; High response rate in Ven failures; Mutation agnostic

Avoids Resistance Mechanisms – Circumvents MDR1 (P-glycoprotein pumps); avoids cross-resistance with existing anthracyclines, venetoclax and cytarabine

Superior Tissue/Organ Distribution – Multilamellar lipid-based delivery system supports rapid cellular uptake; “organotropism” enables targeting never before possible

Annamycin Delivered Superior Efficacy in R/R AML

CR[1]	**50%**
CRc[1]	**60%**
OS for CR[3]	**15.2 months+**
OS for 2L[1]	**12.4 months**
OS for (1-7L)[4]	**12.4 months**
CR Durability[2]	**13.1 months**
MRD Negative[3]	**75%**
BMT[3]	**50%**

Note: MB-106 Trial; Annamycin in combination with Ara-C (AnnAraC)

The Phase 2 data shown here represent more than 2x the complete remission rate of the leading 2L AML treatments.

Durability and OS are also substantially higher.

1 – Median; 2L subjects (n=10) 2 – Median; 1-3L CR's (n=8). Durability for CRc is ~6 mos (n=9). 3 – CR or better responders (n=8). 4 continue with OS. 4 – For all subjects measurable OS (n=22). 5 -Bruno C. Medeiros, Is there a standard of care for relapsed AML?, Best Practice & Research Clinical, Haematology, Volume 31, Issue 4, 2018, Pages 384-386, ISSN 1521-6926; Roboz GJ, Sanz G, et al. Guadecitabine vs TC in relapsed/refractory AML after intensive chemotherapy: a randomized phase 3 ASTRAL-2 trial. Blood Adv. 2024 Apr 23;8(8):2020-2029. doi: 10.1182/bloodadvances.2023012062. PMID: 38231126; PMCID: PMC11103175.; Faderl S, Wetzler M, et al. Clofarabine plus cytarabine compared with cytarabine alone in older patients with relapsed or refractory acute myelogenous leukemia: results from the CLASSIC I Trial. J Clin Oncol. 2012 Jul 10;30(20):2492-9. doi: 10.1200/JCO.2011.37.9743. Epub 2012 May 14. PMID: 22585697; PMCID: PMC4874149. All – As of June 30, 2025. Data is preliminary subject change and subject to final Clinical Study Report.

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MB-106: AnnAraC 2L Efficacy in Venetoclax R/R Patients

Venetoclax regimen failure leaves patients with dismal options

Age	Relapsed or Refractory	Ven-Aza/ Ven-Dec Best Efficacy	Ven-Aza/ Ven-Dec Cycles (months)	AnnAraC Cycles	AnnAraC Efficacy	Overall Survival (months)
78	Relapsed	PD	17	3	CR	24.9+
64	Refractory	SD	2	1	CR	14.1
64	Relapsed	CR	2	2	CRi[1]	3.2
75	Refractory	PR	6	1	PD	2.0
75	Relapsed	CR	Unknown	0	Allergic[2], PD	NA[2]

AnnAraC 40% CR rate and 60% CRc rate in Venetoclax R/R AML

Recent study[3] of Ven-HMA failures in 1L patients:

- *Dismal outcomes upon failure - OS median for R/R AML post Ven regimens is 2.4 months*
- *R/R that received salvage therapy (n=24) attained CRc 12.5% and CR 4%*

AnnAraC > 4x better by comparison

Kura (Ziftomenib) just announced 36% CRc rate in Ven failures (non-ITT, combined with Ven, n=14) and did not disclose CR rate[4]

1 – Subject succumbed to an infection that, upon review, could have been avoided with proper standard of care infection prophylaxis
2 – Subject had allergic reaction to Annamycin and therefore did not receive a full treatment cycle; 1st such reaction in approximately 100 patients treated
3 – A. Maiti, C. Rausch, J. Cortes, Et al, "Outcomes of relapsed or refractory acute myeloid leukemia after frontline hypomethylating agent and venetoclax regimens, *Haematologica* online, vol. 106 No.3 (2021)
4 – Kura Oncology; data presented at the 2024 American Society of Hematology (ASH) Annual Meeting

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AML Key Opinion Leaders' Support for Annamycin

"The preliminary clinical activity of Annamycin in heavily pretreated, relapsed/refractory AML patients who had progressive disease following Ara-C and VEN is very exciting and would provide a much-needed treatment option for other patients who otherwise have very poor outcomes. Having a drug that can overcome these resistance pathways and provide a benefit in these high-risk patients, while not doubling-up on toxicities could truly be a game-changer."[1]

Giovanni Martinelli, MD, University of Bologna, Lead of the EU financed program IMPACT-AML and member of the Moleculin Scientific Advisory Board

"Annamycin combined with Ara-C could significantly advance the standard of care and provide better outcomes for these high-risk patients. I am excited to be a part of the next step in the development of this important asset[2].... This is very striking data, and what is interesting it holds up for patients who had Venetoclax based treatments but also patients who have chemotherapy. We are involved in a large number of new agents and the data that is shown here is always inferior to these really incredibly high response rates to Annamycin."[3]

Michael Andreeff, MD, PhD, Professor of Medicine, Department of Leukemia, Division of Cancer Medicine, The University of Texas MD Anderson Cancer Center and a member of the Company's Scientific Advisory Board

"The latest preliminary AML data suggest that Annamycin could result in a promising new treatment for AML. I am excited to work alongside the Moleculin team to continue advancing its development and further explore its potential to address these areas of significant unmet need."[4]

Martin Tallman, MD, Internationally Renowned Clinical Investigator whose Discoveries have Fueled the Progress of Leukemia-Targeting Therapies

"Definitely there is unmet need, and we have to remember that more than 50% of patients are still dying from AML despite all the recent advances. And the situation is more grim in the relapsed/refractory setting, where if you don't have a targetable mutation, then your only chance for cure is bone marrow transplant. So, the exciting idea about a new anthracycline without cardiotoxicity is extremely important, and especially where Venetoclax might fail."[5]

Mohamad Cherry, MD, Medical Director of Hematology at Atlantic Health System

1. Moleculin. (2024, December 11). *Moleculin Announces Online Publication of Preclinical Data Demonstrating Significant Activity of Annamycin in Venetoclax Resistant AML Model* [Press Release]
2. Moleculin. (2024, November 18). New Findings Show Moleculin's Annamycin Overcomes Resistance to Venetoclax in AML [Press Release]
3. Andreeff, M. (2024, May 7). Acute Myeloid Leukemia (AML) Clinical Day. [Video]. Moleculin Biotech, Inc.
4. Moleculin. (2024, May 1). Moleculin Announces Formation of Scientific Advisory Board to Support Development of Annamycin [Press Release]
5. Cherry, M. (2024, October). Moleculin Biotech KOL Event. [Video]. Moleculin Biotech, Inc.

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2L Treatment Alternatives

	Ven-Aza[1]	Targeted[2]	**AnnAraC[3]**
Approval study size (n)	67 (Accelerated approval for 1L AML)	92-247	**10** (P3 unblindings at 30 and 60 subjects pending in 2026, approval expected on 152)
CRc	38% (in 2L)	29% (average)	**60%**
CR	N/A (in 2L)	21% (average)	**50%**
Median number of cycles	13	4-5	**2**
Durability of response	6-10 months	4-11 months	**13 months**
Days in clinic[4]	~33	~10-12	**~12-14**
Suitable Patient Population	Must exclude 1L Ven-Aza (~half of AML patients)	Only in specific mutations (40-50% of AML patients left unserved)	**Most 2L patients[5]**

1. Cai Q, Xiao J, Weng C, Chen H. Efficacy and safety of venetoclax plus azacitidine based regimens in the treatment of relapsed or refractory acute myeloid leukemia: a systematic review and meta-analysis. Ann Hematol. 2025 Oct;104(10):4931-4948. doi: 10.1007/s00277-025-06643-0. Epub 2025 Oct 28. PMID: 41145917; PMCID: PMC12619768. 2. Prescribing information for Gilteritinib, Idhifa, Tibsovo and Ziftomenib. 3. Moleculin MB-106 Phase 1B/2 clinical trial. 4. Clinician interviews (Ven-Aza: Azacitidine is delivered in 7 daily injections per cycle (month) plus 2 follow up visits in cycle 1 and at least 1 thereafter; Targeted: 4 visits during first cycle (month) and 2 per cycle for duration of treatment; AnnAraC: infusion over 5 days plus 1-2 follow up visits). 5. AnnAraC is considered mutation agnostic, 3L and beyond, ECOG ≥3 and LVEF <50% subject to confirmatory trial post-approval, FDA is limiting 2L use in FLT3 positive subjects in the MIRACLE trial unless a FLT3 inhibitor is inappropriate or unavailable. Additional limits on prior anthracycline use to less than 200 mg/m^2. Management estimates the initial labeling should represent 70-80% of all 2L AML patients.

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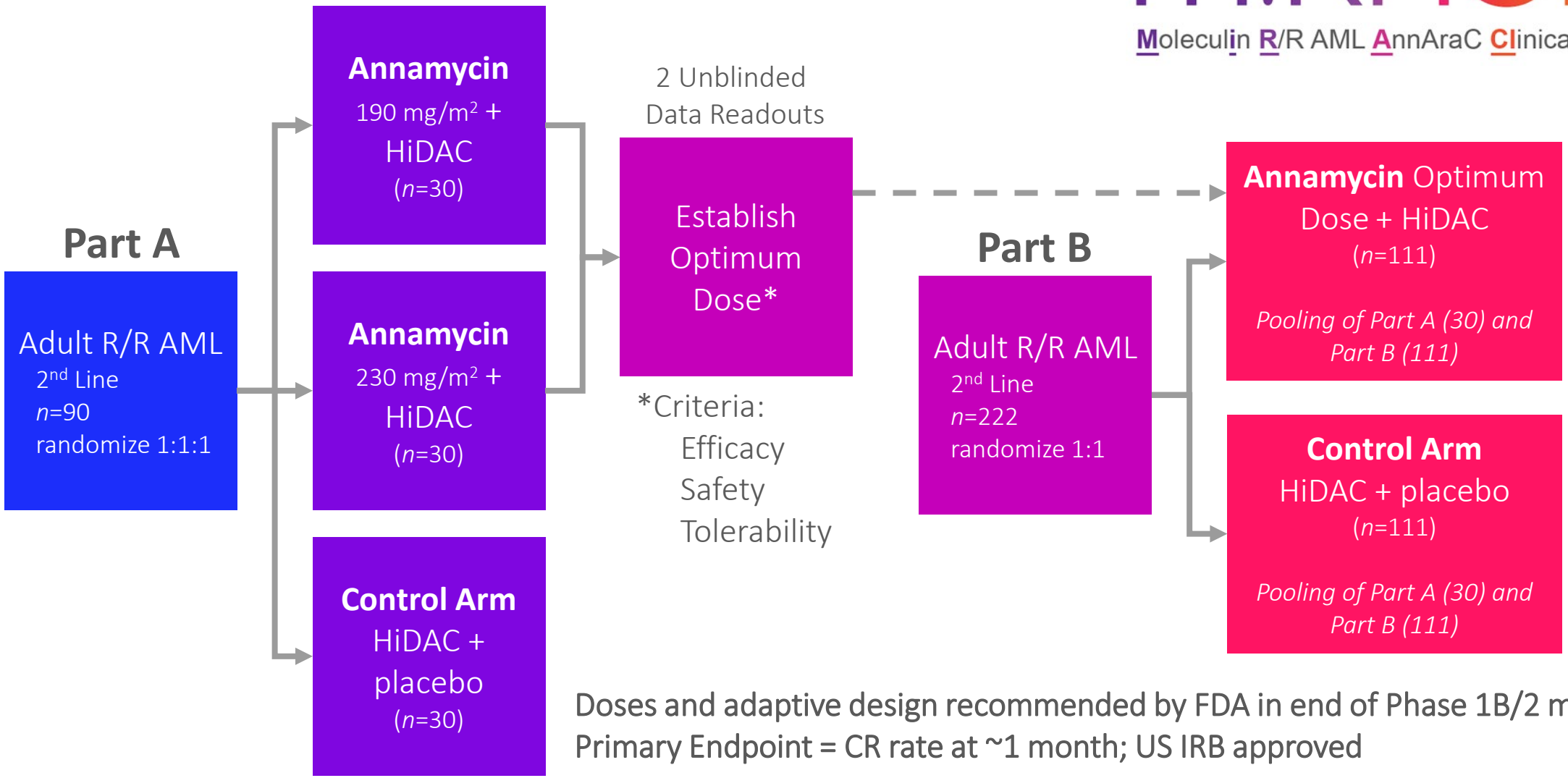
Adaptive Trial Design

MiRACLE
Moleculin R/R AML AnnAraC Clinical Evaluation



Doses and adaptive design recommended by FDA in end of Phase 1B/2 meeting;
Primary Endpoint = CR rate at ~1 month; US IRB approved

Note: The clinical trial approval with EMA was granted under the condition that the Company present results of appropriate nonclinical GLP studies before initiating the Phase 3 portion (Part B) of the study. Results will be submitted as a substantial modification to the existing approved protocol.

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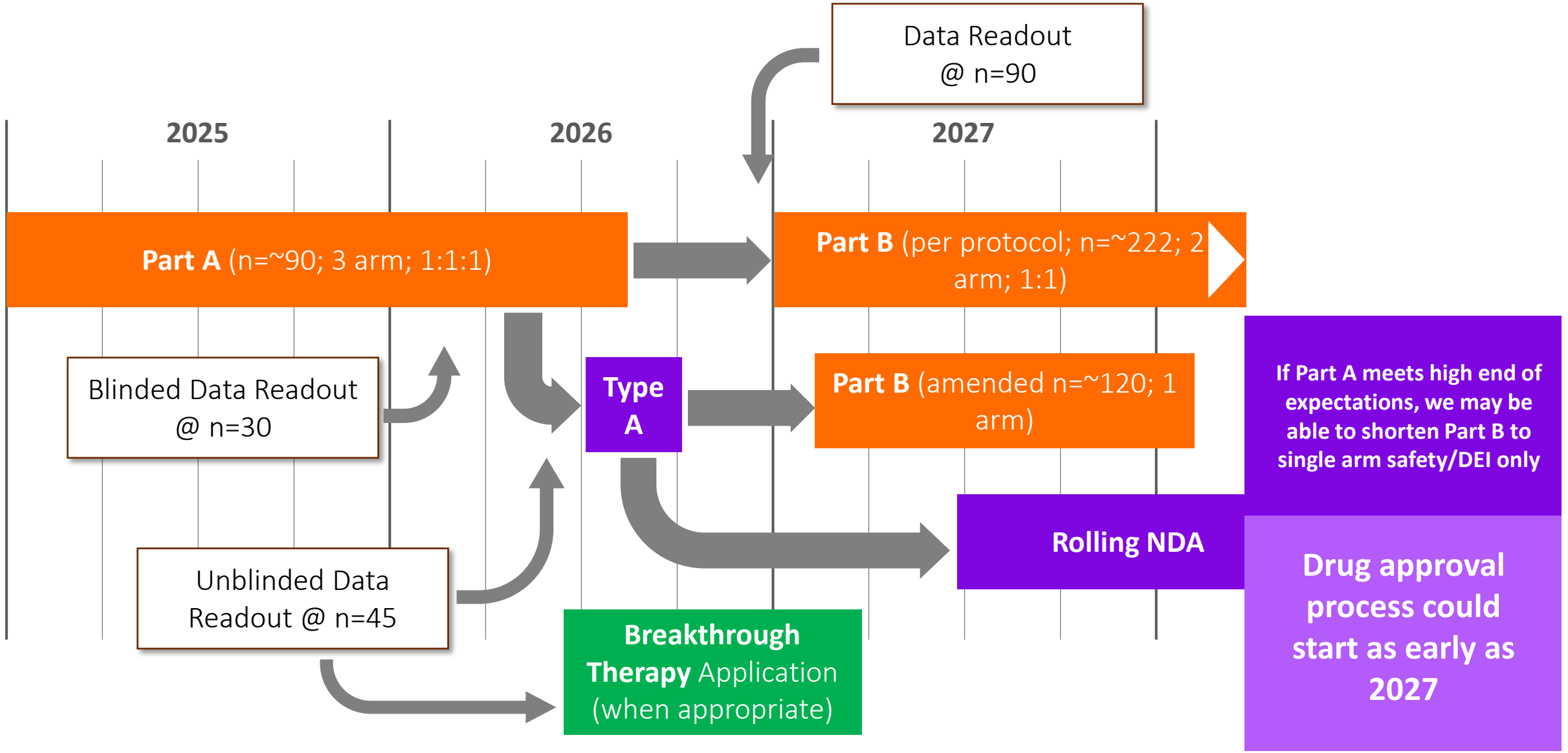
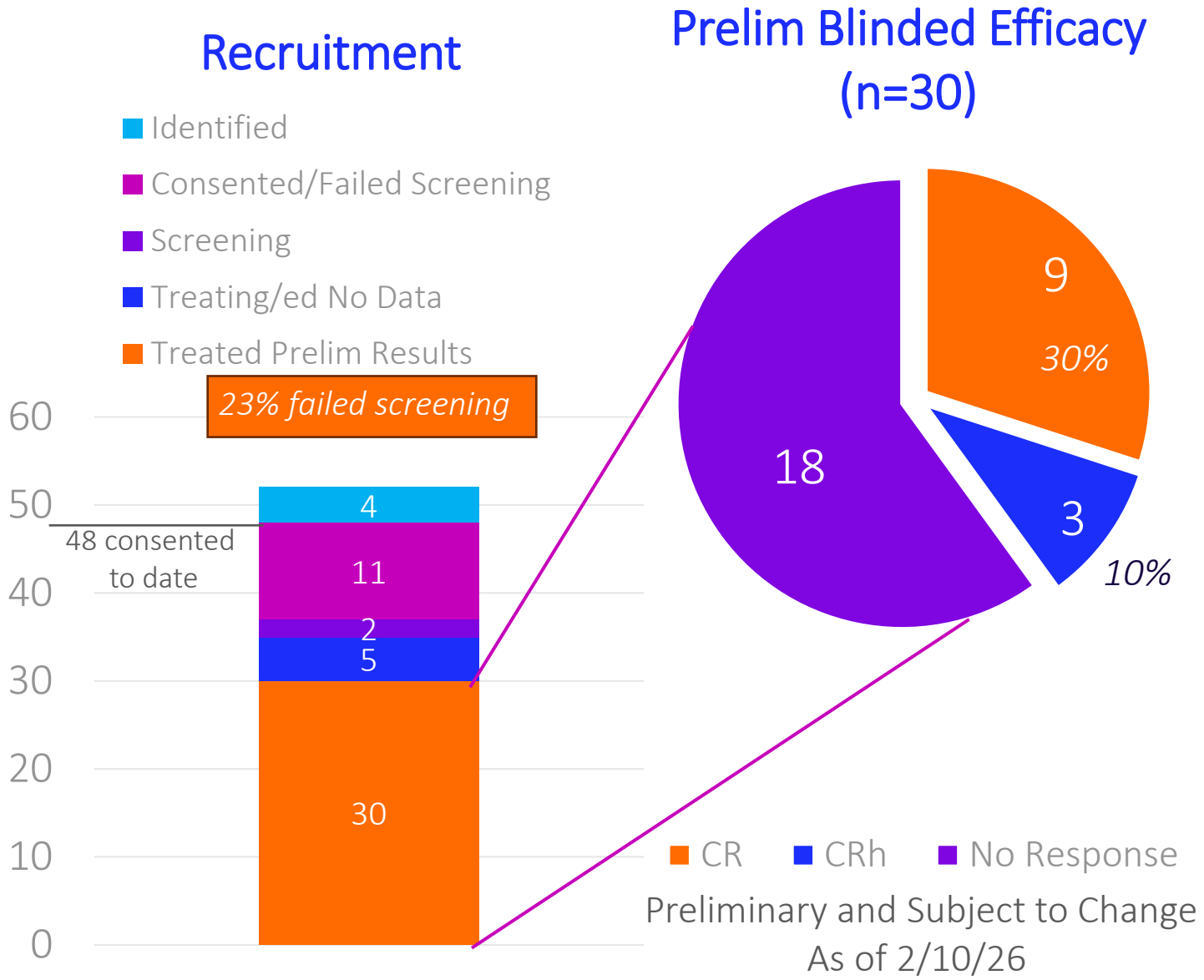
Potential Accelerated Timeline



Note: NDA rolling process length dependent upon level of funding of CMC and supporting NDA data efforts.

Recruitment & Preliminary Blinded Activity



Efficacy is within mgt expectations considering randomization
CRc 40%
CR 30%

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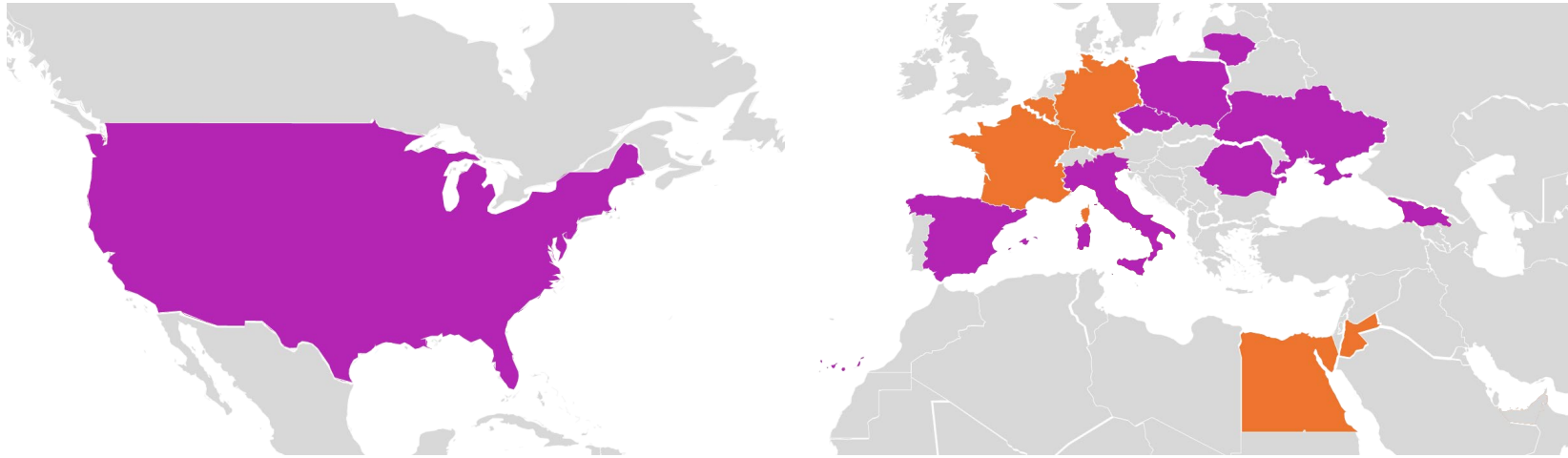
MIRACLE Trial: Registrational Scale

MiRACLE
Moleculin R/R AML AnnAraC Clinical Evaluation

40+ Global Sites (Part B)	**4** Continents
8/14 Active/Targeted Countries	**Decentralized** Design = faster enrollment, greater credibility

Active & Targeted Sites ● Sites Open (Part A) ● In Process for Part B



“Annamycin is desperately needed to fill the unmet need for R/R AML despite advancements with targeted therapies.”

— Consistent feedback from 30+ investigator meetings

EU Recruitment Strong

~25 sites active across 10 countries in Part A

Competing EU trial tests existing agents — Annamycin’s novel mechanism is differentiated

US Expansion → FDA Signal

~10+ US sites targeted for Part A&B

Greater US enrollment strengthens FDA NDA filing and KOL engagement

MENA / APAC Expansion

~5 sites targeted for Part B

Broad geographic reach maximizes enrollment velocity and patient access

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AML Alone Has Home Run Potential

	Approved Phase 2 Complete					Pre-Approval	
	1st Line		2nd Line				
	Jazz	AbbVie	Servier	Kura[1]	Syndax[1]	JNJ[1]	Moleculin
	Vyxeos	Venclexta	Idhifa/Tibsovo	Ziftomenib	Revumenib	617	Annamycin
N	153	286	199/174	20	57	17	10
CR	**38%**	**37%**	**19%/25%**	**35%**	**18%**	**24%**	**50%**
CRc	48%	64%	23%/33%	40%	25%	47%	60%
AML Population	50%	50%	15-23%	30%[2]	24%[2]	30%[2]	60%
Revenue[3]	~$150M	~$700M (AML)	~$400M				
Valuation	**$1.5B** **Exit[4]** (Acquisition of Celator, 2016)	**N/A**	**$2B** **Exit[5]** (Acquisition of Agios, 2021)	**~$.8B** **Market Cap[6]**	**~$1.5B** **Market Cap[6]**	**N/A**	**~$.024B** **Market Cap[6]**

1. All three are pursuing essentially the same patient population; best overall performance from either NPM1 mutation or KMT2A rearrangement cohorts; 2. Limited to 2nd Line due to low CRc performance; 3. Management estimates; 4. Company press release - https://investor.jazzpharma.com/news-releases/news-release-details/jazz-pharmaceuticals-and-celator-pharmaceuticals-announce; 5. Company press release - https://servier.com/wp-content/uploads/2022/11/servier-completes-acquisition-agios-oncology-business_PR.pdf; 6. See Corporate slide.

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The Full Annamycin Opportunity Extends to Multiple Solid Tumor Indications

Indications Supported by Existing Clinical & Preclinical Data

Indication	Status	US Incidence
AML	Phase 3	22,000
STS Lung	Phase 2	13,000
Pancreatic Liver	Pre-clinical	60,000
Colorectal Liver	Pre-clinical	104,000
Colorectal Lung	Pre-clinical	104,000
RCC Lung	Pre-clinical	67,000
Endometrial Lung	Pre-clinical	67,000
HCC	Pre-clinical	33,000
TNBC Lung	Pre-clinical	41,000
Osteosarcoma Lung	Pre-clinical	1,000
Total		512,000

How Big Could the Market Be for Annamycin?

Cancer cases per year	US+EU	5,000,000
Treated with anthracyclines	~50%	2,500,000
Annamycin courses per year	10%	250,000
Annual revenue potential [1]	$20k - $50k per course (~4-5x current generics)	**$5 - $12 billion**

1 - Per management's estimates

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Financials

Nasdaq: MBRX

- ~$16M pro forma Q4 cash on hand with runway into the Q3 2026[1, 2]
- ATM of $8.2M available

$1.96L – $5.30H 60 Day Stock Price[3]

5.3 Shares O/S[4]

~183K – Daily Trading Vol.[5]

Mgt has reduced overhead and engaged with institutions for IIT programs for preclinical and clinical activity for Annamycin & WP1066 programs while accelerating Phase 3 data readouts.[1]

1: Based on management's current estimates of operations. 2: Cash on hand as of December 31, 2025, plus proceeds from financing in Q1-26; 3: 60 day high and low as of March 18, 2026, per Yahoo Finance; 4: As of March 2, 2026; 5. As of March 18, 2026– 3 mo. avg. per iHUB.

Upcoming Annamycin & WP1066 Milestones

Annamycin AML & Pancreatic

Q1 2026

- Update on non-cardiotoxicity review of subject data by the Company's independent expert
- MIRACLE – 45th subject treated in Q1 with unblinding of data for 45 subjects late Q2

Q3 2026

- MIRACLE – 90th subject recruited
- MIRACLE – 90 subjects unblinded

2H 2026

- MIRACLE – Start of Part B
- Atlantic Health pancreatic cancer clinical trial begins

2027

- Begin recruitment of 3rd line AML subjects
- End recruitment of Part B
- Begin pediatric AML clinical study

2028

- Primary efficay data for MIRACLE
- Rolling NDA Begins

WP1066 - CNS

Q1 2026

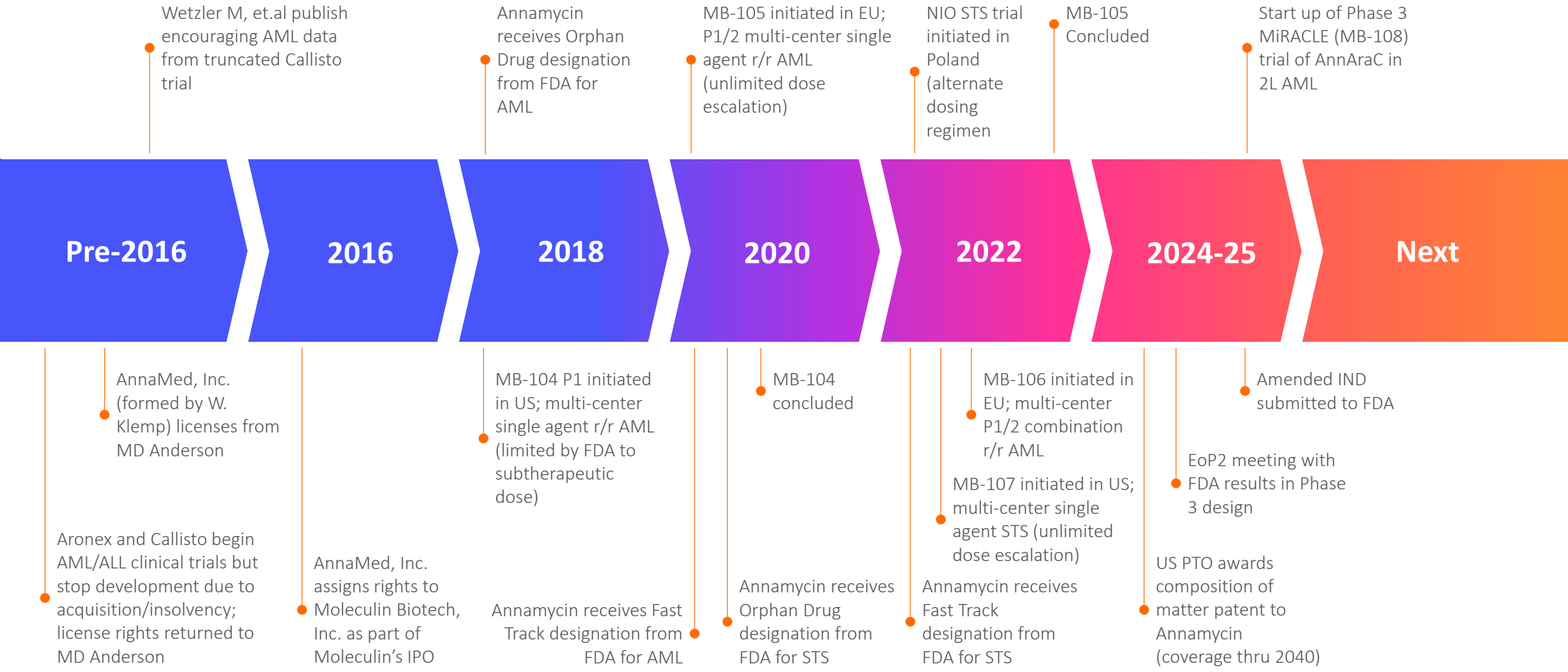
- Phase 2 GBM at Northwestern continues

2H 2026

- Phase 2 pediatric trial brain tumor begins at Emory
- Preclinical data on WP1066 IV formulation

Appendix

History of Development



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AML Clinical History

Phase 1: MB-104 MONOTHERAPY 100-120 mg/m^2	Phase 1/2: MB-105 MONOTHERAPY 120-240 mg/ m^2	Phase 1/2: MB-106 COMBINATION THERAPY Annamycin + Cytarabine
• n = 7 • 17% CRi (at suboptimal dosing) • Dosing limited by FDA Lifetime Anthracycline Dose (LTMAD) • Trial location – US	• n = 20 • Median lines of prior therapy = 4 • Median age of 240 mg/m^2 (RPD2) cohort = 65 years • 80% ORR in 240mg/m^2 Cohort (N=5) • Trial location - Poland	• n = 22 (0-6 prior lines), n = 10 (1 prior line) • All subjects (n=22) 41% CRc • 2nd Line (n=10), 60% CRc, 50% CR • Median age all subjects = 69 • Trial location – Poland & Italy • "3+5" therapy
Key Findings		
• Well-tolerated in the study population • Limited to low doses • Morphologic leukemia free state was achieved in one subject in the 120 mg/m^2 cohort	• Positive correlation between response rate and dose	• Median overall survival: 2nd line = 12.4 mos. (n = 10) • Median durability CR's: 13.1 months and increasing (n = 8) • Strong efficacy signal even where Ven-HMA has failed
Regulatory Significance		
• Demonstrated safe dosing within FDA-mandated limitations for anthracycline exposure	• Demonstrated safe dosing beyond FDA (and EMA) limitations for cumulative anthracycline exposure and early efficacy as single agent	• Addition of Cytarabine supported by compelling preclinical data showing improvement over Annamycin monotherapy

Source: Clinical study reports for MB-104 & MB-105. In MB-105 CRi = BMA <5%. MB-106 data are preliminary and subject to change.
"ITT" = Intent to treat.

MB-106 (Annamycin + Ara-C (AnnAraC); n = 22)

Line of Therapy	All Lines (1st – 7th)	1st Line	2nd Line	2nd & 3rd Line Combined
Subjects Evaluable	22	4	**10**	14
Subjects Evaluable Not Dosed per Protocol	2	0	**1**	1
Median Age - Years (Range)	67.5 (19-78)	56.5 (19-69)	**71 (53 - 78)**	69.5 (53-78)
Complete Remission (CR)	**8 (36%)**	**2 (50%)**	**5 (50%)**	**6 (43%)**
Complete Remission Composite (CRc)	9 (41%)	2 (50%)	**6 (60%)**	7 (50%)
Partial Response (PR)	2	0	**1**	2
BMT to Date	4	1	**2**	3

Notes: 1) As of June 30 2025. Data from MB-106 are for intent to treat subjects who had efficacy determined (n=22); 2) Data from MB-106 are preliminary and subject to change – CSR to be published; and 3) Relapses include 1 death due to pneumonia (unrelated to drug).

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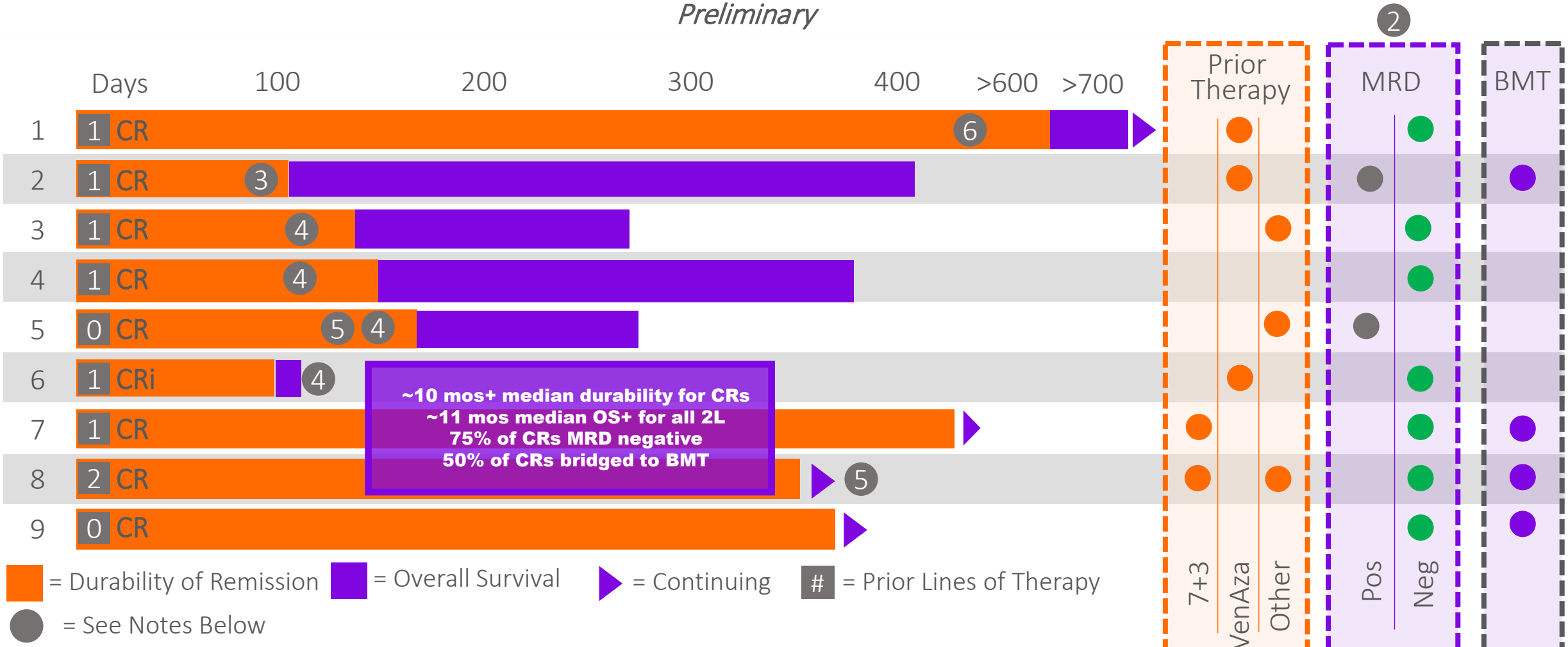
MB-106: Durability, MRD, Prior Therapies - CR/CRi

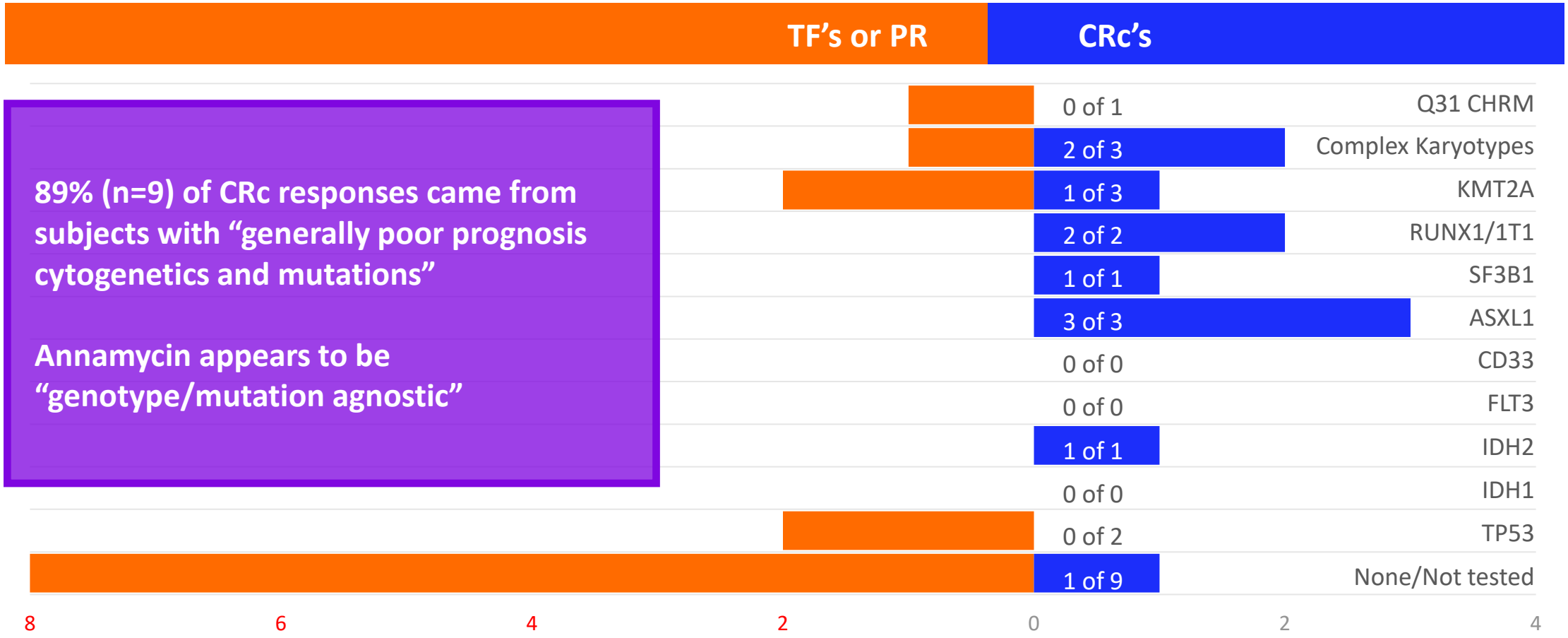
Preliminary



1) MB106 data are preliminary and subject to change until a Clinical Study Report is published. 2) MRD testing is not standard between sites. 3) Progression based on circulating blasts. Achieved CR with BMT afterward. Relapsed post BMT and died of infection. 4) Subjects did not receive SOC for infection and succumbed to infection. 5) Subjects comprise median durability for CRs. Subject #9 is ongoing thus CRs' durability is increasing. 6) Subject relapsed and was treated under compassionate use and achieved another CR and remains on follow-up on OS.

As of July 15, 2025

MB-106 Response by Genotype and Mutation



Note – n=20; Some subjects had multiple mutations or abnormalities, hence totals of treatment failures (TF), partial remissions (PR) or composite complete remissions (CRc) do not equal totals for each response category – TF's/PR's, or CRc's; Data are anecdotal only and not intended to indicate statistical significance. Not all mutations/subjects were tested.

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Notes (see slide 12)

1. This chart compares Complete Response (CR) rates as submitted for FDA approval for existing 2nd line therapies (as single agents) to preliminary CR data for AnnAraC (the combination of Annamycin and Ara-C); Note: these data are from separate clinical trials with differing protocol designs and should not be considered direct comparisons. For example, existing therapies were tested in and approved only for those subjects with corresponding mutations, whereas AnnAraC data are for all relapsed/refractory AML subjects regardless of gene mutations. Mylotarg data are adjusted for subsequent studies showing reduced relevance of limited CD33 expression.
2. Not approved in EU; US approval only; Kura has filed for approval of Ziftomenib in the US.
3. High-Dose Ara-C: Mirros Trial, 81% 2nd line patients; 17% CR, within 56 days, Konopleva et al, Blood Advances, 26 July 2022, Volume 6, Number 14; 2 – Classic I Trial, 18% CR rate within 120 days, Faderl et al, J Clin Oncol, July 2012, Volume 30, Number 20
4. AnnAraC studied in all-comer r/r AML subjects (n=22) with data stratified for 2nd line (n=10); data preliminary and subject to change.
5. Assumes each drug targeting IDH1 achieves its respective CR number independent of the other (i.e., no cannibalization between drugs).
6. CR numbers for FDA approved second line therapies: F Thol et al; How I treat refractory and relapsed acute myeloid leukemia; Blood; 4 January 2024; Volume 143, Number 1. Note: some trials, including AnnAraC included patients with more than one prior lines of therapy.
7. CR rate multiplied by % of AML population presenting with targeted mutation (example: Gilteritinib achieved 21% CR rate in FLT3 subjects, which mutation is present in 27.5% of AML population, hence 21% x 27.5% = 5.8% of the total AML population are expected to achieve CR with this therapy).

MiRACLE

Moleculin R/R AML AnnAraC Clinical Evaluation

FDA Established Pathway to Approval

AnnAraC v. HiDAC[1]	3 Arm w/ 2 Early Data Readouts	CR = Primary Endpoint	SoC Post R/R Either Arm
Compare Annamycin + HiDAC (AnnAraC) v. HiDAC alone	Adaptive trial design per Project Optimus[2] determines Part B dose	Primary Endpoint is Complete Response after ~35 days (OS is secondary)	Standard of care available to all R/R subjects post initial treatment

Met with the FDA in summer 2024 for an End of P1B/2 Meeting which assisted with development of the MIRACLE trial. FDA agreed that MB-106 demonstrated no cardiotoxicity.

Notes: 1 – High-Dose Ara-C (2 gm/m²/day for 5 days); 2 – See Project Optimus slide in Appendix

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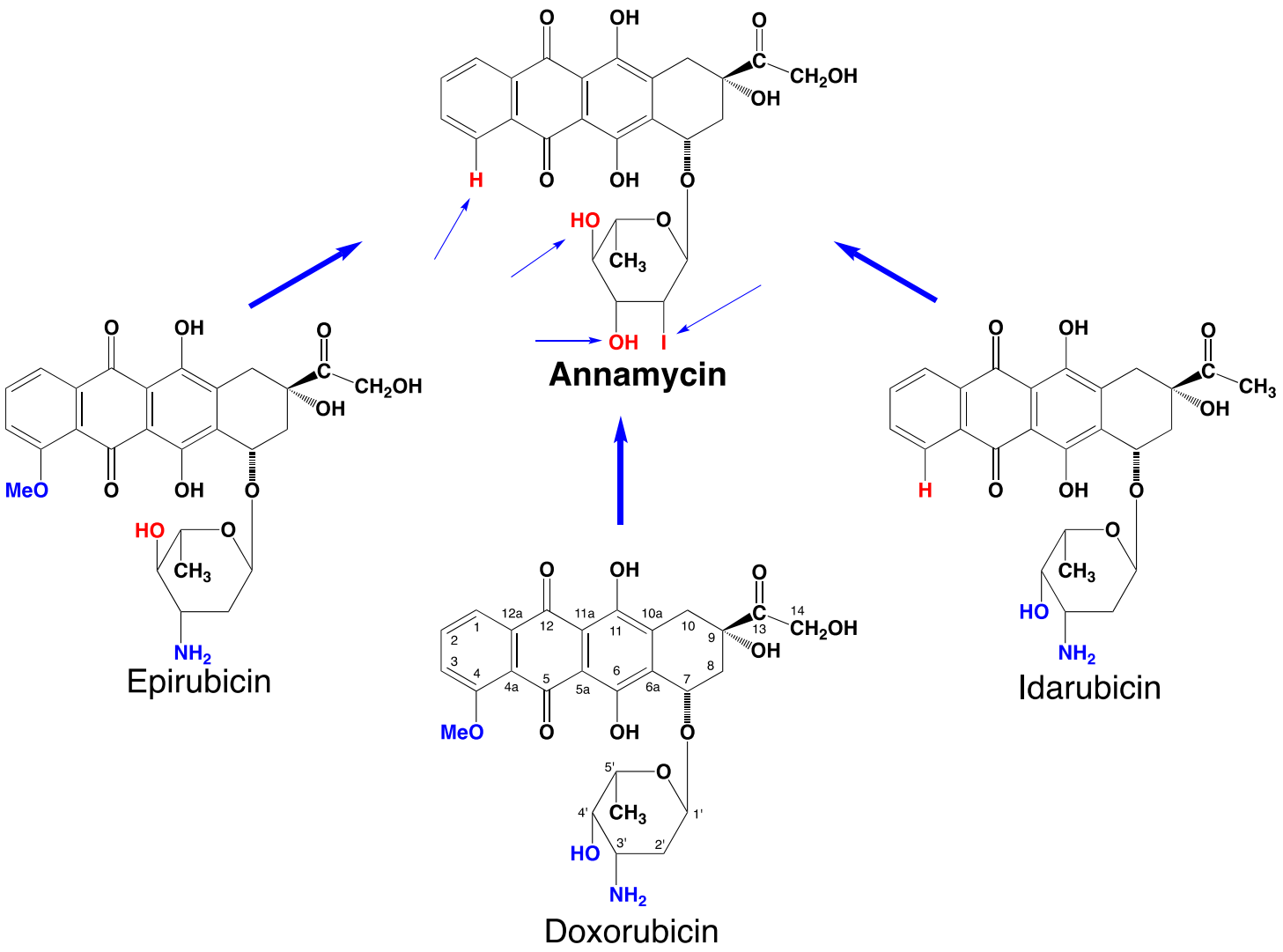
Annamycin: A Novel Anthracycline



Unique new structure:

- Incorporates key structural elements of 3 different clinically used anthracyclines, plus
- The 3'-deamination and introduction of iodine at C-2; Iodine is a material add to the molecular mass

Result:

- Elimination of cardiotoxicity
- Overcomes MDR1 resistance mechanisms
- Increased potency
- Rapid cellular uptake
- **Improved tissue and organ distribution**
- **Active against leukemias resistant to:**
  a) **clinically use anthracyclines**
  b) **Ara-C**
  c) **Venetoclax**

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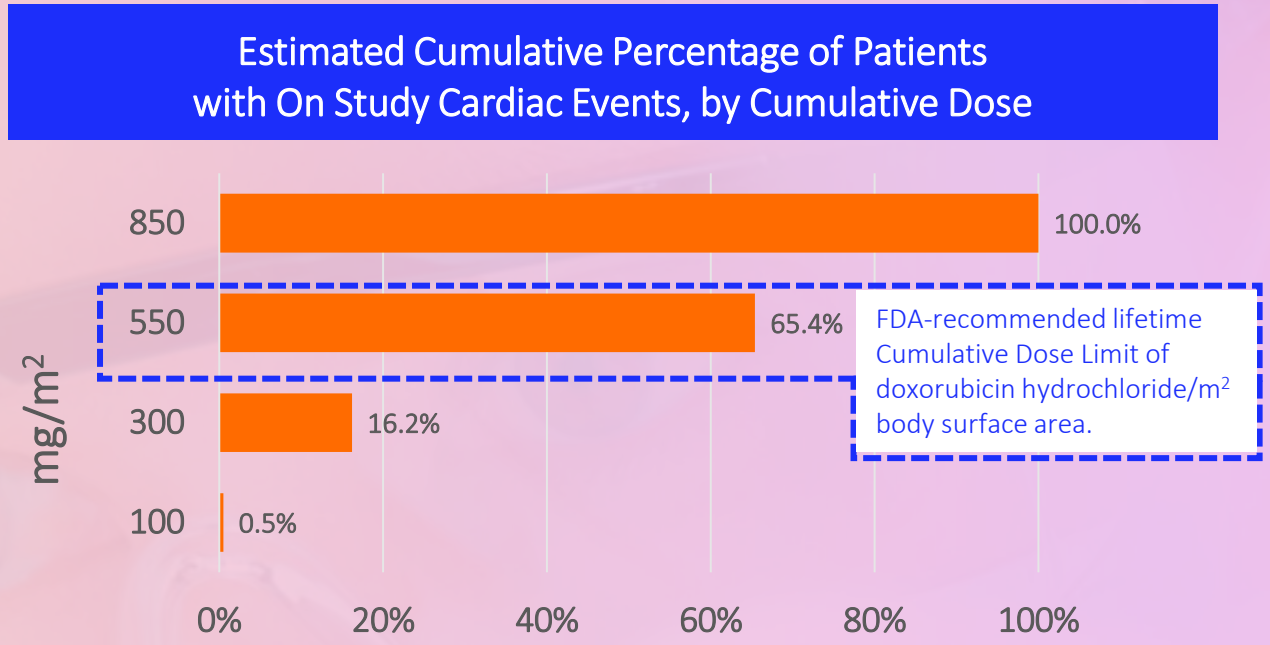
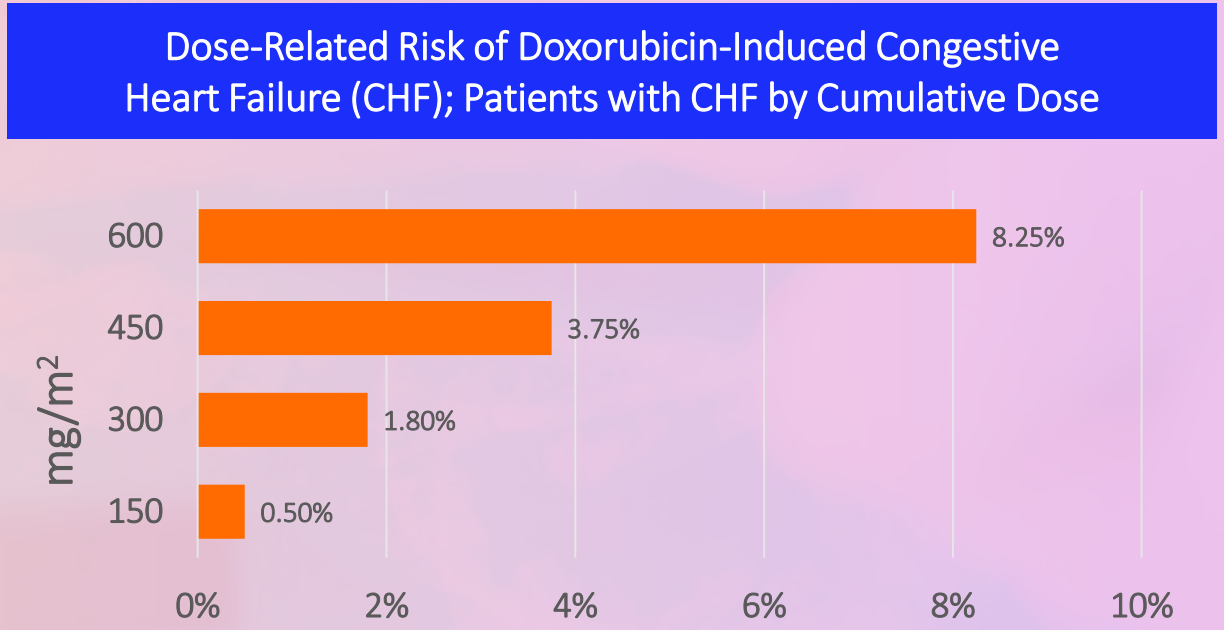
Traditional Anthracycline Cardiotoxicity Accumulates Over Time and Limits Efficacy





Annamycin - Efficacy of Traditional Anthracyclines with Less Toxicity Plus Potential for Maintenance Therapy

Non-Cardiotoxic

Zero cardiotoxicity per independent expert (84 subjects reviewed to date)

Patients treated up to 5x FDA lifetime max for Dox

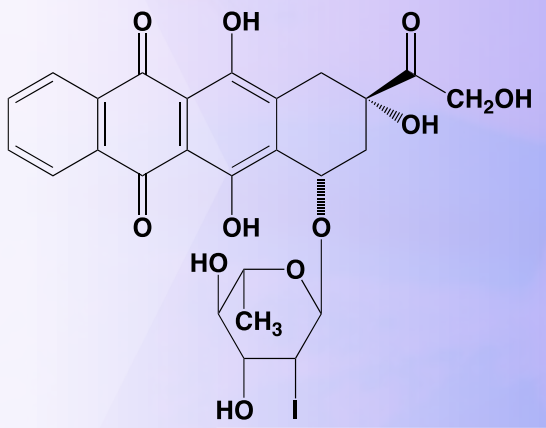
Enables repeated cycles and consolidation

Avoids Cross Resistance

with currently prescribed anthracyclines, Ara-C and Venetoclax in preclinical models

Annamycin

Zero Cardiotoxicity

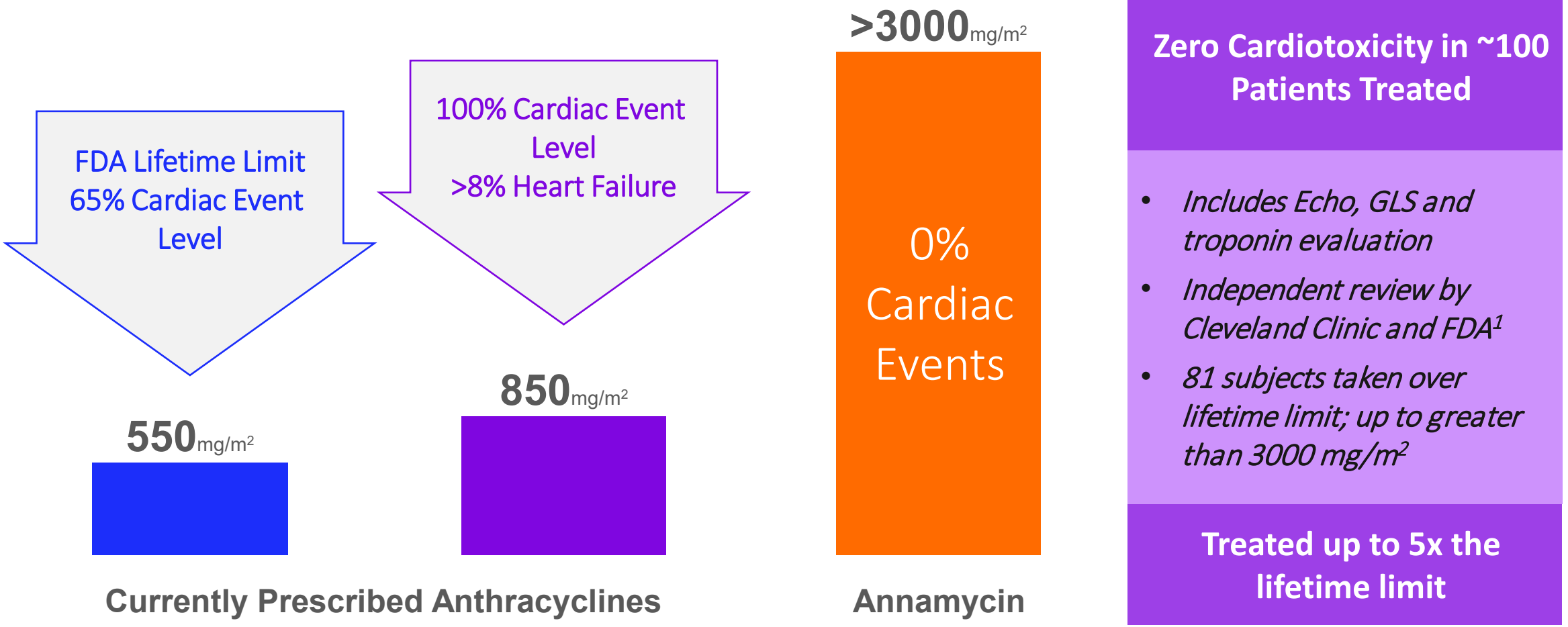


Wider therapeutic window

Avoids multidrug resistance

Better tissue/organ targeting

Eliminating Cardiotoxicity



Zero Cardiotoxicity in ~100 Patients Treated

- *Includes Echo, GLS and troponin evaluation*
- *Independent review by Cleveland Clinic and FDA[1]*
- *81 subjects taken over lifetime limit; up to greater than 3000 mg/m²*

Treated up to 5x the lifetime limit

Source Current Cardiology Review, Anthracycline Cardiotoxicity: Prevalence, Pathogenesis and Treatment, Maria Volkova and Raymond Russel III. Referenced from Cancer. 2003 Jun 1;97(11):2869-79. "Congestive heart failure in patients treated with doxorubicin: a retrospective analysis of three trials". Swain SM, Whaley FS, Ewer MS., PMID: 12767102; Preliminary clinical studies from Moleculin. 1 – based on evaluation of first 85 patients treated demonstrated zero cardiac events related to Annamycin

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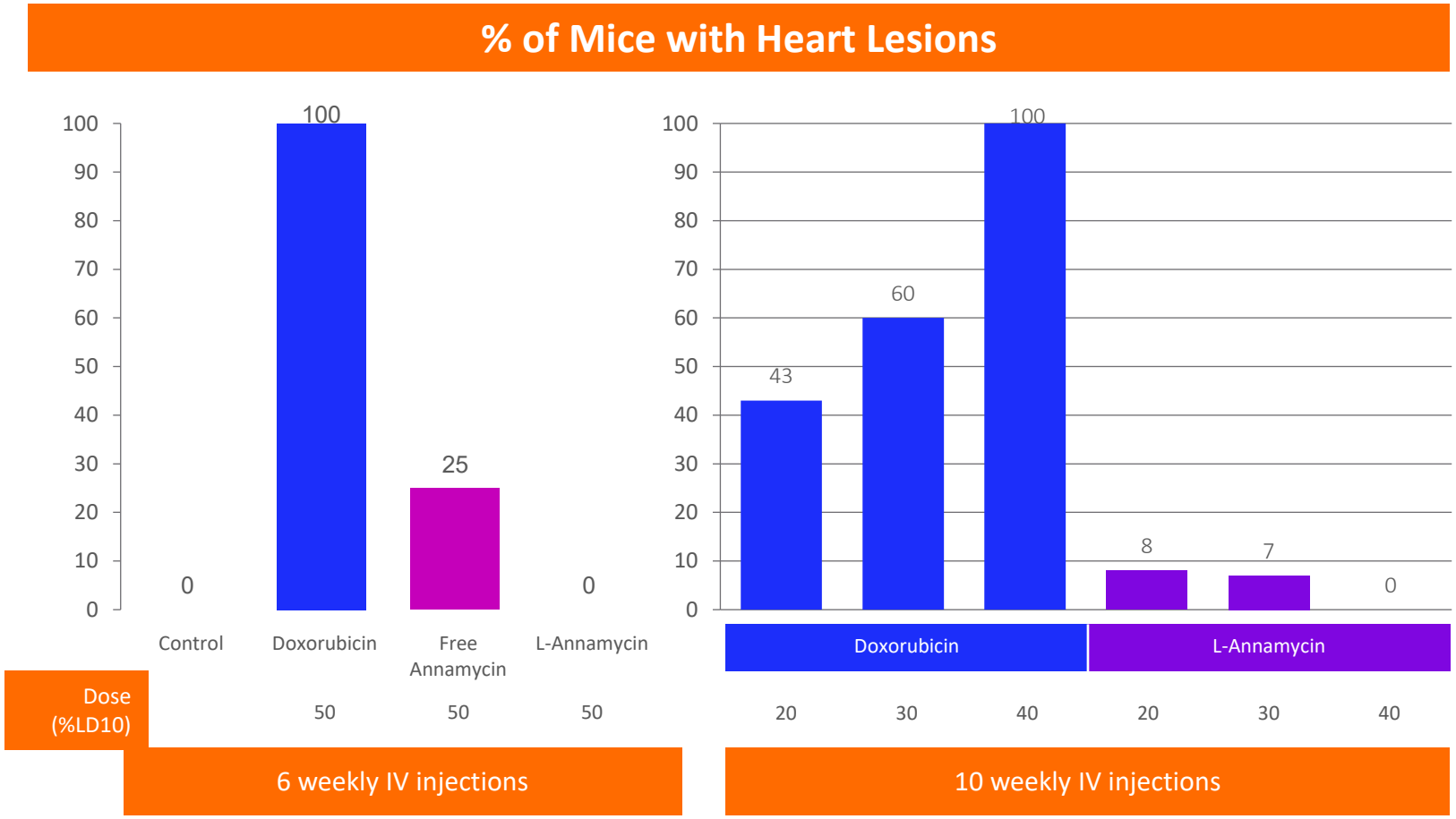
FDA Recommended Model Shows Annamycin's Lack of Cardiotoxicity



The gold standard preclinical Bertozolli model for measuring cardiotoxicity shows Annamycin is effectively non-cardiotoxic when compared with doxorubicin.

Free Annamycin (API only) is substantially less cardiotoxic than doxorubicin and L-Annamycin (as formulated) is essentially non-cardiotoxic.

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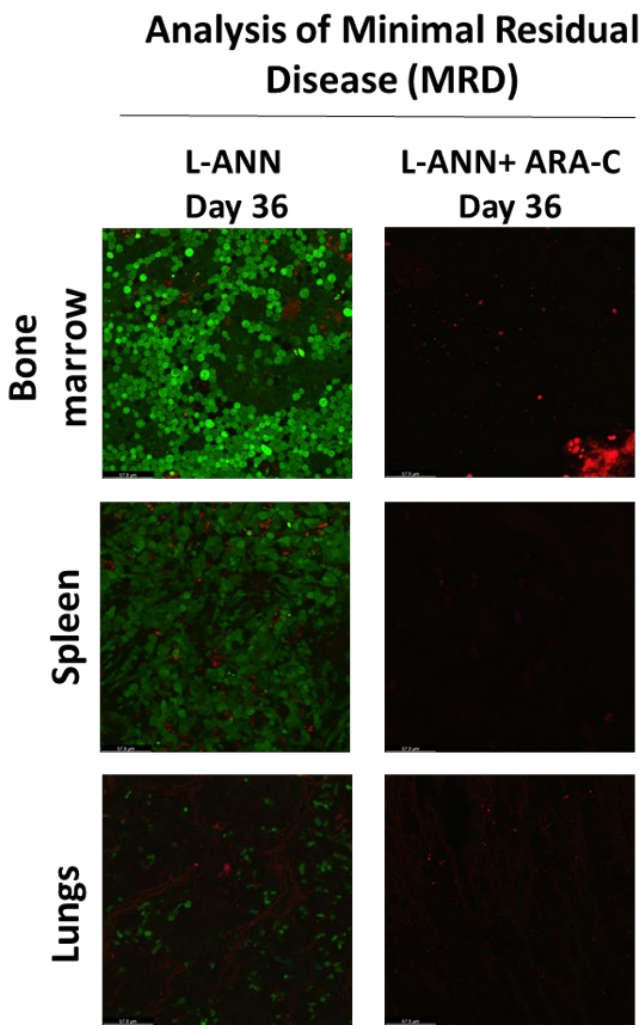
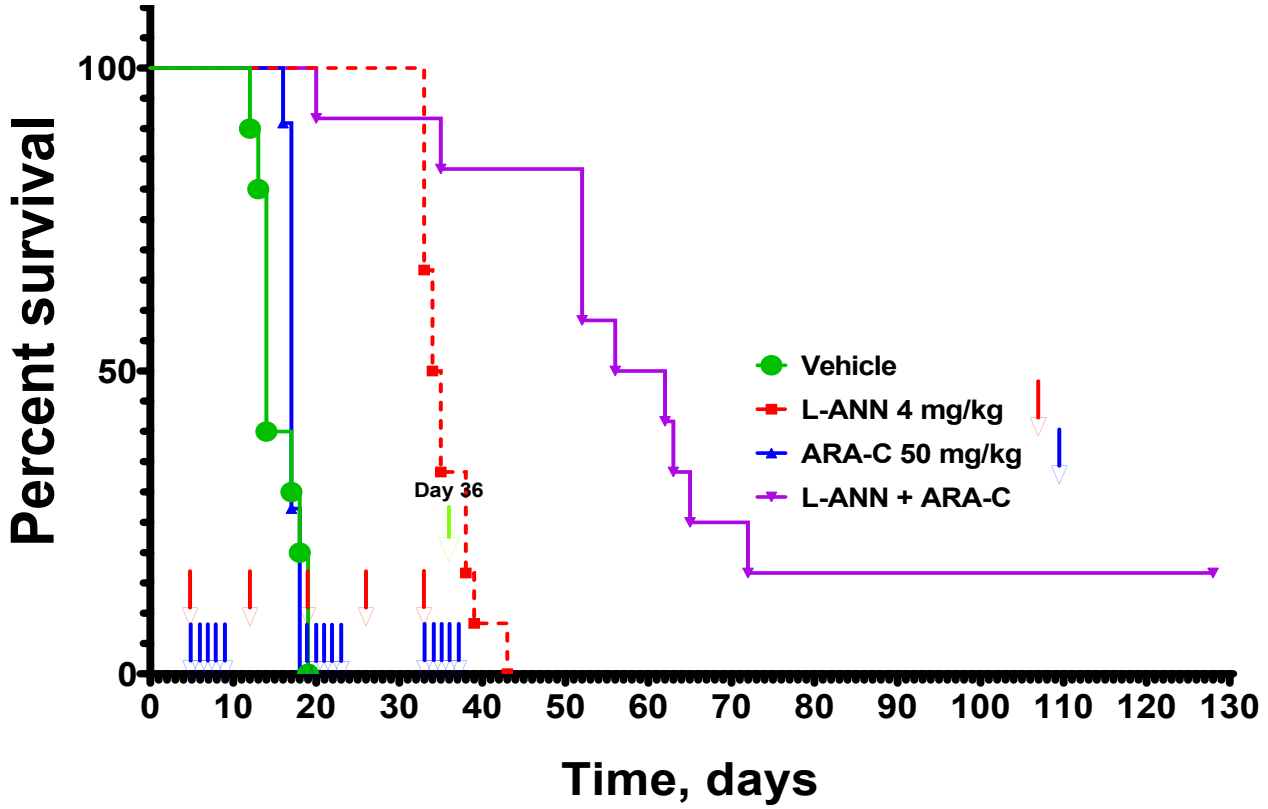
Annamycin Synergizes with Ara-C in Increasing Survival in Highly Aggressive p53-null, FLT3 Mutated AML Model



	Median survival	P vs vehicle	P vs ARA-C	P vs L-Ann
vehicle	14	-	0.6	
ARA-C	17	0.6	-	<0.0001
L-ANN	34.5	<0.0001	<0.0001	-
L-ANN + ARA-C	58	<0.0001	<0.0001	<0.0001



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Performance of AML Therapies in 2nd Line

CLAVELA: International Randomized Phase 3 Study of Elacytarabine Versus Investigator Choice in Patients with Relapsed/Refractory Acute Myeloid Leukemia

381

R/R AML subjects

Elacytarabine

(compared with)

7 different NCCN recommended therapies

Therapies compared:

- high-dose cytarabine (HiDAC)
- MEC
- FLAG/FLAG-Ida
- low-dose cytarabine
- hypomethylating agents
- hydroxyurea
- supportive care

Results:

There were no significant differences in OS (3.5 vs 3.3 months), response rate (CR = 15% v 12%) between the elacytarabine and control arms, respectively. There was no significant difference in OS among any of the investigator's choice regimens.

Gail J. Roboz, Todd Rosenblat, Martha Arellano, Marco Gobbi, Jessica K. Altman, Pau Montesinos, Casey O'Connell, Scott R. Solomon, Arnaud Pigneux, Norbert Vey, Robert Hills, Tove Flem Jacobsen, Athos Gianella-Borradori, Øivind Foss, Sylvia Vetrhusand, and Francis J. Giles , J Clin Oncol 32:1919-1926.

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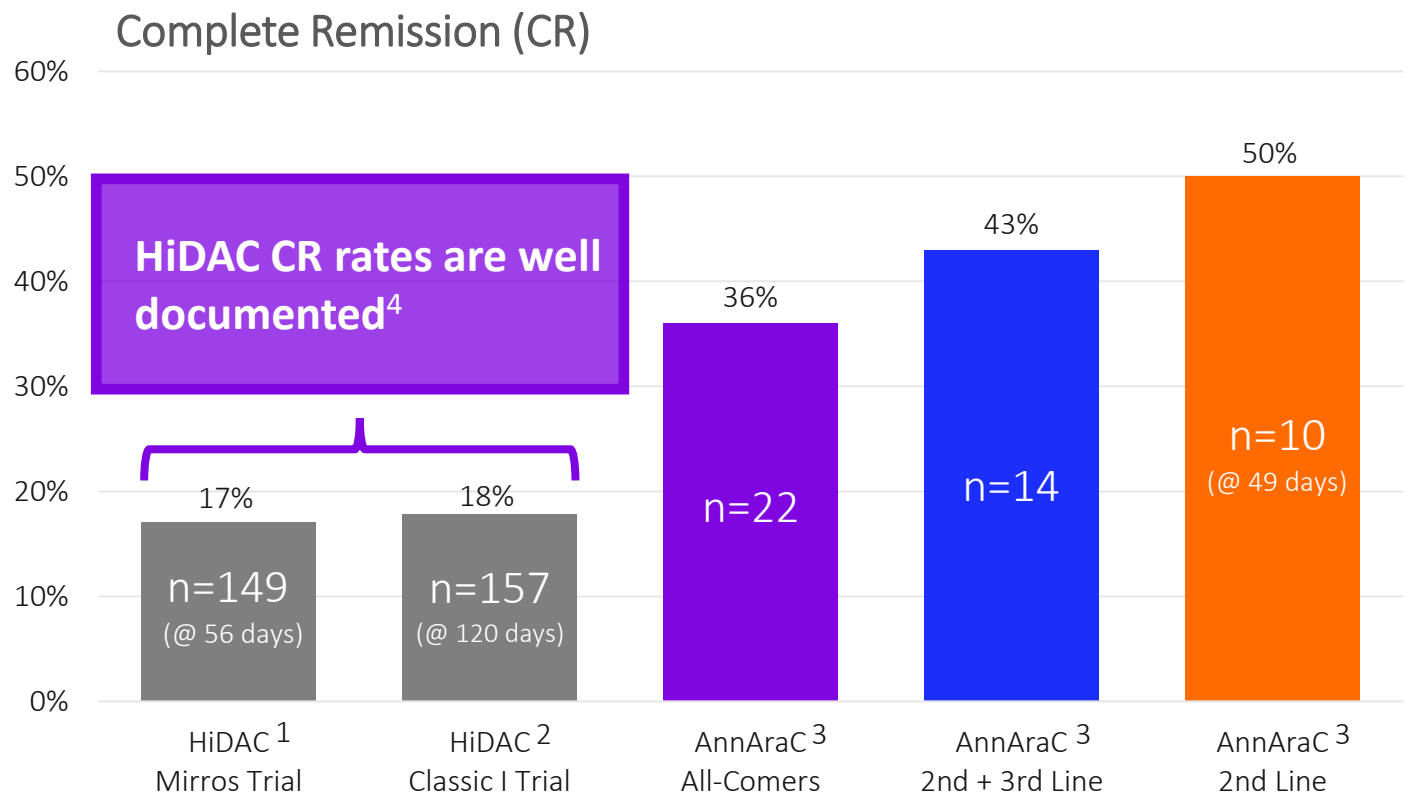
AnnAraC Demonstrated Superior Complete Remission (CR) Rate Compared to Current Standard of Care



Annamycin NDA to be based on CR rate in 2nd line subjects at ~1 month

1 – Mirros Trial, 81% 2nd line patients; 17% CR, within 56 days, Konopleva et al, Blood Advances, 26 July 2022, Volume 6, Number 14; 2 – Classic I Trial, 18% CR rate within 120 days, Faderl et al, J Clin Oncol, July 2012, Volume 30, Number 20; 3 – MB-106 trial, 50% CR rate for 2nd line patients (n=10, within 49 days), 43% CR rate for 2nd + 3rd line patients (n=14), and 36% CR rate for all-comers (1st through 7th line, n=22); 4 – Rates for Mirros and Classic I based on 1 g/m2/day for 5 days vs 2 g/m2/day for 5 days in MB-106 and 108, however per Löwenberg B, et al, Cytarabine Dose for Acute Myeloid Leukemia, N Engl J Med 2011;364:1027-1036 DOI: 10.1056/NEJMoa1010222, VOL. 364 NO. 11, no statistically significant difference in outcomes (including CR) was noted in a head-to-head comparison between 1g/m2/day and 2 g/m2/day..

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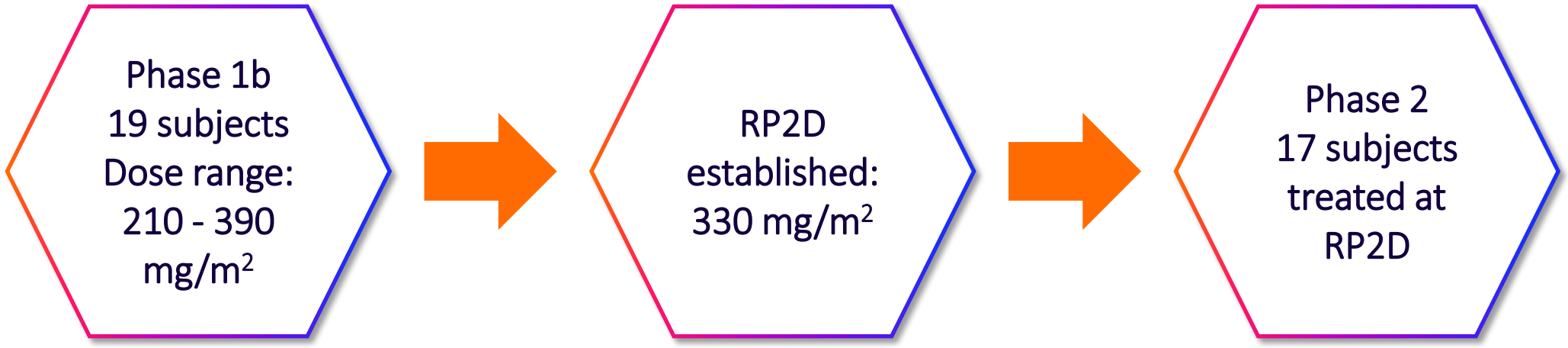
MB-107 STS Lung Mets w/ Annamycin Summary*

*Per final clinical study report

MB-107 Overview

LIPOSOMAL ANNAMYCIN (L-ANNAMYCIN)[1], MB-107 – PHASE 1B/2 STUDY OF LIPOSOMAL ANNAMYCIN (L-ANNAMYCIN) IN SUBJECTS WITH PREVIOUSLY TREATED SOFT TISSUE SARCOMAS WITH PULMONARY METASTASES

A multi-center, open-label, single-arm study that in Phase 1B determined the Maximum Tolerable Dose and recommended Phase 2 Dose (*"MTD", "RP2D" respectively) and safety of L-Annamycin and in Phase 2 explored the efficacy of L-Annamycin as a single agent for the treatment of subjects with Soft Tissue Sarcoma (STS) with lung metastases ("STS Lung Mets" ,"Advanced STS") for which chemotherapy was considered appropriate.*



Total n=36, with n=32 evaluable for PFS (4 lost to follow up or withdrew)

1 – Also known as "Annamycin" and "Naxtarubicin".
Source: Table 5 of Clinical Study Report ("CSR")

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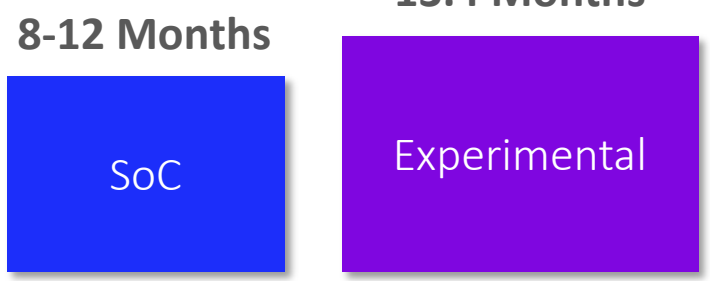
Median OS Outperforming in STS Lung Mets

Meta Analysis of 10 Studies and 2,267 Subjects* (Range of Salvage Therapies)

8-12 Months

13.4 Months



2nd Line

MB-107 (n=36) (Annamycin)

13.5 Months

7th Line

Annamycin delivering better performance 7th line than would be expected even in 2nd line for monotherapy

*Comandone A, et al; "Salvage Therapy in Advanced Adult Soft Tissue Sarcoma: A Systematic Review and Meta-Analysis of Randomized Trials"; The Oncologist 2017;22:1518–1527

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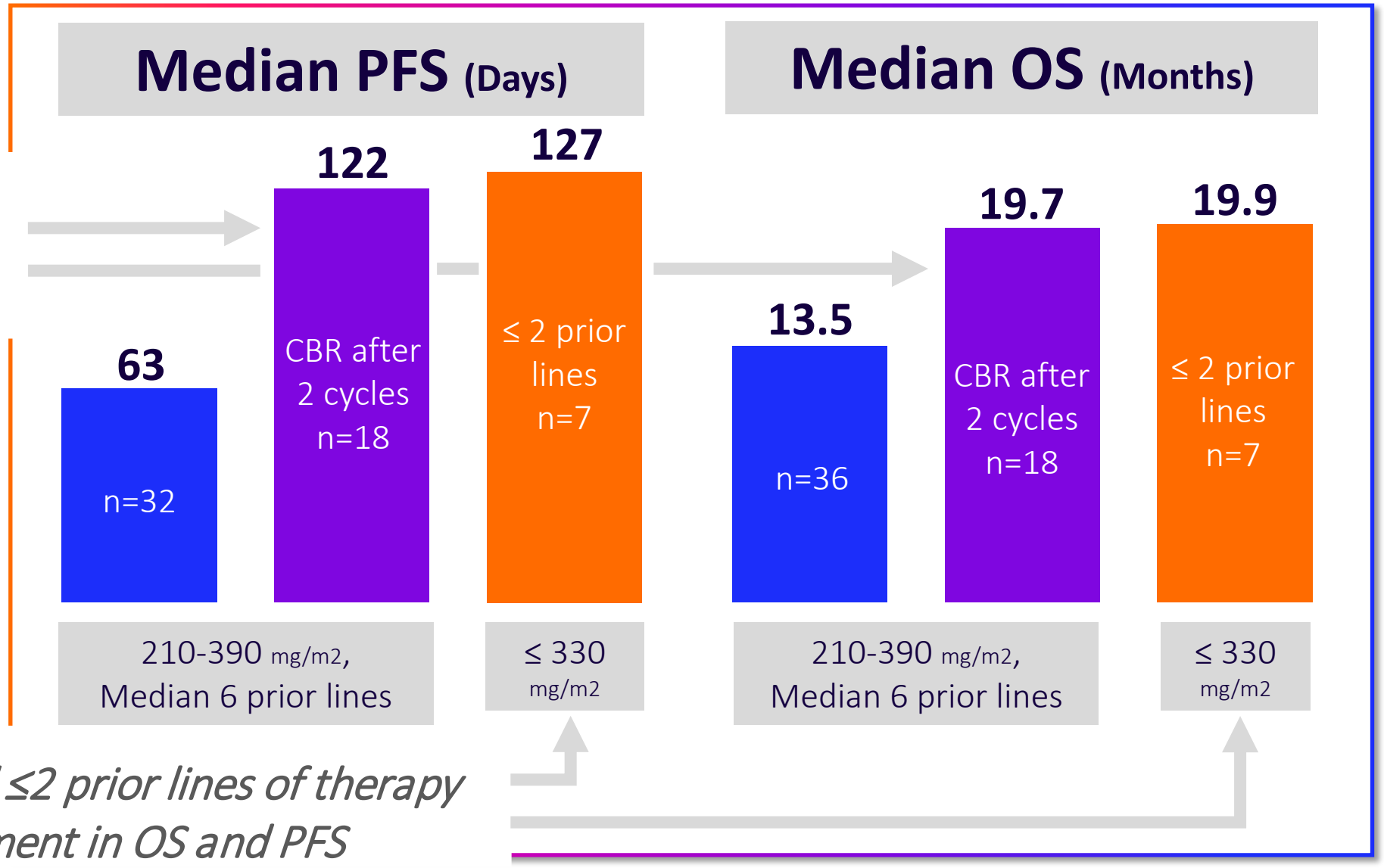
PFS and OS Improved in Dose Dependent Manner

Responders (SD or PR) after 2 cycles showed improvement in OS and PFS



≤330 mg/m2 and ≤2 prior lines of therapy showed improvement in OS and PFS

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WP1066 Update

Clinical Trial with WP1066 at Northwestern University

- Externally funded Phase 2 trial of oral WP1066 in combination with radiation treating glioblastoma (GBM), a form of brain cancer
- Northwestern is actively enrolling subjects with 7 recruited dosed to date
- Minimal investment from Moleculin - supplying drug product

Preclinical Studies with WP1066 IV Formula at Emory University

- Evaluating various WP1066 IV formulations in preclinical studies with the goal of selecting the best molecule to move into a clinical
- Study drug was delivered in April 2025
- Results from such studies expected in the second half of 2025

Science Advisors

Waldemar Priebe, PhD
MD Anderson Cancer Center
Founding Scientist & SAB Chair

Dr. Daniel Von Hoff
Mayo Clinic

Hematology Oncology

Dr. Martin Tallman
Northwestern University

Dr. Jorge Cortes
Augusta University

Dr. Michael Andreeff
MD Anderson Cancer Center

Dr. Giovanni Martinelli
Bologna University

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Recent Developments

Relapsed or Refractory Acute Myeloid Leukemia

- ✓ Enrollment and dosing underway in Phase 3 clinical trial, MIRACLE, evaluating Annamycin (naxtarubicin) in combination with cytarabine (AnnAraC) for the treatment of R/R AML
  - ✓ Multination trial with active sites in the United States, Europe, Ukraine and Georgia
  - ✓ First patient treated in March 2025 – 30+ sites selected for Part A as of May 30, 2025. 60% of first 45 subjects enrolled Nov. 4, 2025
  - ✓ Multiple near-term unblinded data readouts expected: 45 subjects recruited in 1Q 2026; unblinding shortly thereafter; 90 subjects 1H 2026
  - ✓ World Health Organization approved "naxtarubicin" for the non-proprietary name for Annamycin
  - ✓ Bolstered Annamycin intellectual property portfolio with granting of two new U.S. patents

Soft Tissue Sarcoma (STS) Lung Mets

- ✓ Encouraging efficacy and safety data demonstrated from MB-107 trial with final data readout reported
  - ✓ Previously completed enrollment in the Phase 2 portion of its U.S. Phase 1B/2 clinical trial
  - ✓ Orphan Drug Designation from the FDA
  - ✓ Expect to identify next phase of development in near term

Pancreatic Cancer

- ✓ Announced letter of intent with Atlantic Health Systems, Inc. to support investigator-sponsored Phase 1b/2 trial of Annamycin in third-line pancreatic cancer patients

Global Network

- All technology licensed from MD Anderson Cancer Center (MDACC)
- Supports continuing preclinical research on our technology at MDACC
- Active contractors in US, EU and Asia for drug production and distribution as well as for clinical trial management
- Past & current externally funded trials – MD Anderson Cancer Center; Emory University, Aflac Cancer & Blood Disorders Center, Children's Healthcare of Atlanta; Northwestern University (NIH & BrainUp); Madame Curie Institute (Poland) and others in discussion