

Actinium
Pharmaceuticals, Inc.

Investor Presentation

**Targeted radiotherapies for
patients with unmet needs**

February 2024

ATNM: NYSE AMERICAN

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Company Highlights



- Leader in the development of targeted radiotherapies for patients with AML
- Positive Phase 3 SIERRA trial for lead asset lomab-B; primary endpoint achieved with high significance ($p < 0.0001$) supporting planned BLA, MAA and global regulatory filings
- lomab-B being developed to address the high unmet need in conditioning for potentially curative BMT where a majority of patients are treated in a concentrated number of leading centers globally
- Actimab-A program exhibiting mutation agnostic backbone therapy potential and being advanced in collaboration with the NCI under a balance sheet sparing CRADA
- Strong commercial synergy between lomab-B and Actimab-A focused on top 100 treatment centers where a majority of r/r patients are treated
- Vibrant and differentiated R&D enables next-generation conditioning lomab-ACT program for rapidly growing cell and gene therapies as well as solid tumor indications
- Significant value creation expected due to combination of major milestones and balance sheet strength as ~\$83.0 million cash is projected to fund operations through 2025

Innovation Focused R&D Yields Differentiated, High-Value Programs

Robust Experience Across Multiple Validated Cancer Targets & Isotopes

CD45
Leukemia, Lymphoma
and immune cells

CD33
AML, MDS
and MM

Undisclosed
Solid tumor
theranostics

CD38
MM and leukemia
cells

ICI
Solid tumors and
blood cancers

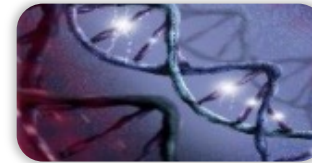
Iodine-131
Range: 2.3 mm
Energy: 0.6 MeV

Actinium-225
Range: .048 mm
Energy: 24 MeV

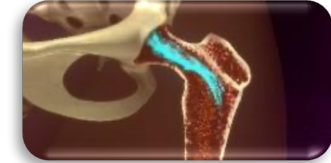
Lutetium-177
Range: 1.8 mm
Energy: 0.50 MeV

Broad Areas of Focus Leveraging Significant Clinical Development Experience

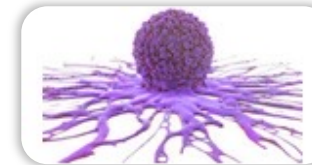
Hematology



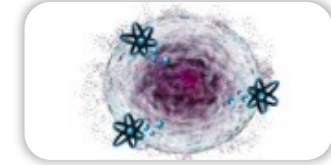
Targeted Conditioning



Solid Tumors

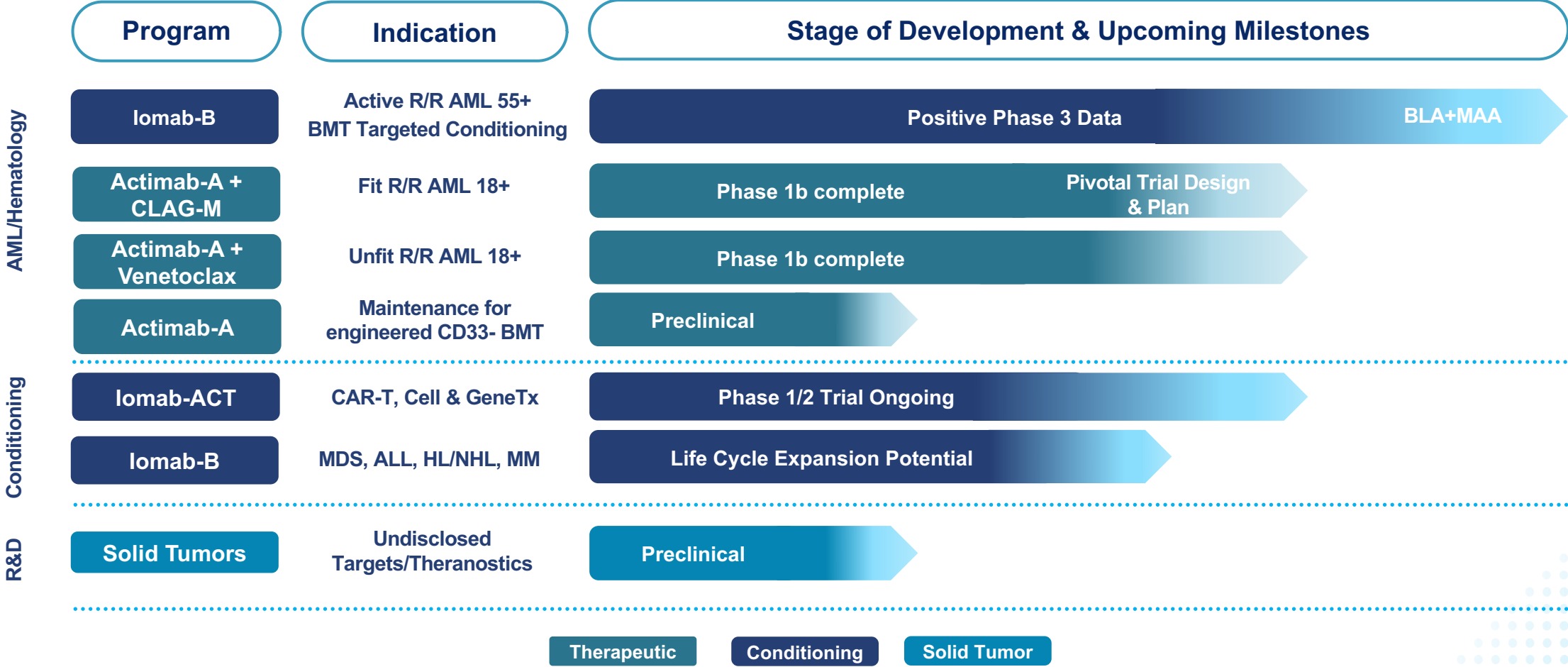


Next-Generation Radiotherapies



Strong, Growing IP Portfolio of 220+ Patents

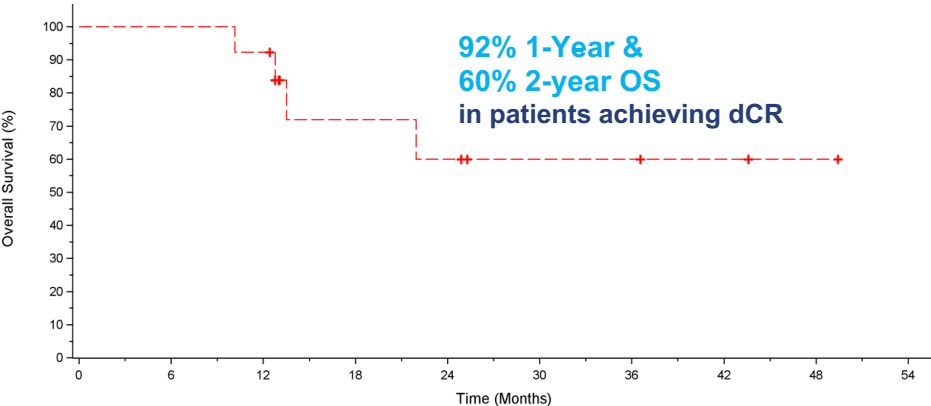
Pipeline: Transformative Potential in AML, Cell & Gene and Solid Tumors



Producing Outcomes in Indications Where Other Modalities Cannot

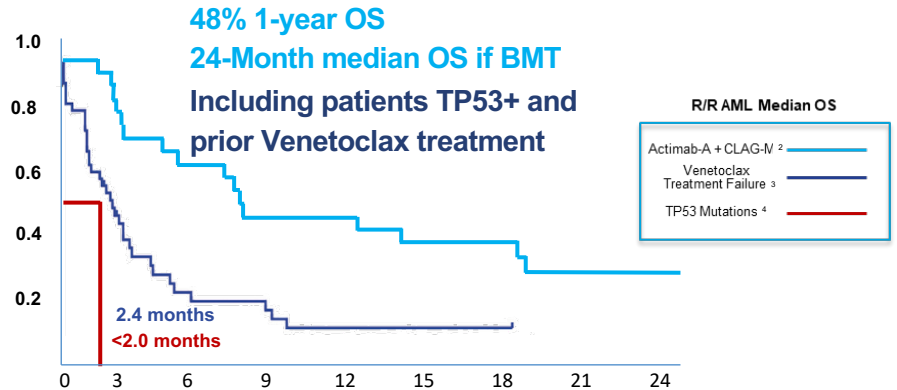
Mutation agnostic targeted radiotherapies have demonstrated the potential to meaningfully improve survival outcomes in patients with difficult to treat R/R AML including those with a TP53 mutation

Iomab-B Phase 3 SIERRA Trial



R/R AML patients age ≥ 55

Actimab-A + CLAG-M POC Trial



Fit R/R AML patients age ≥ 18

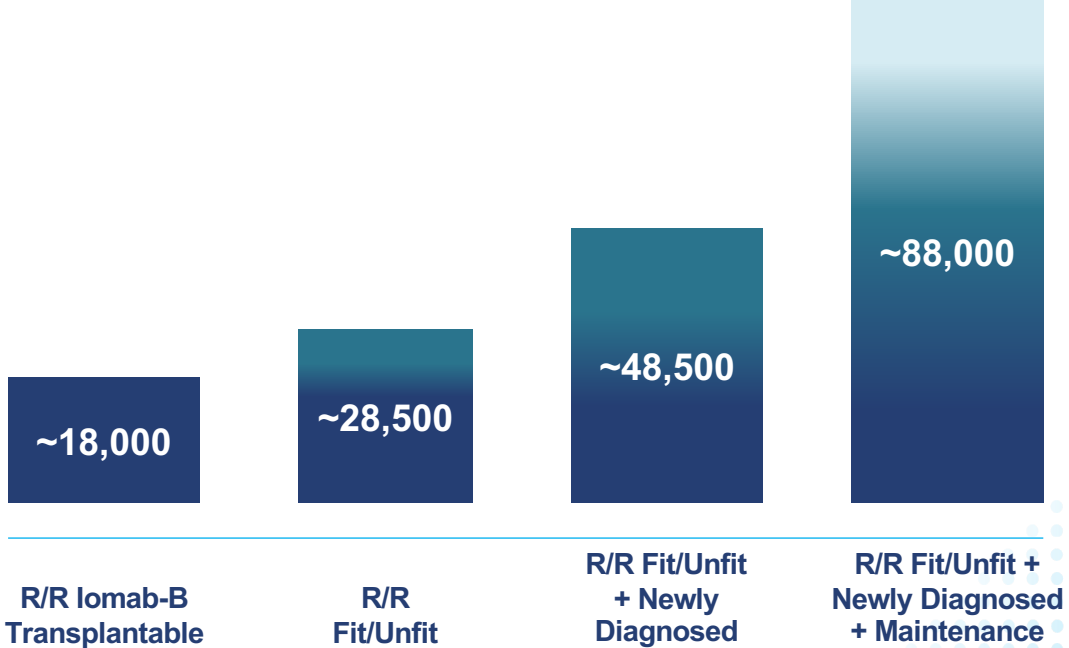
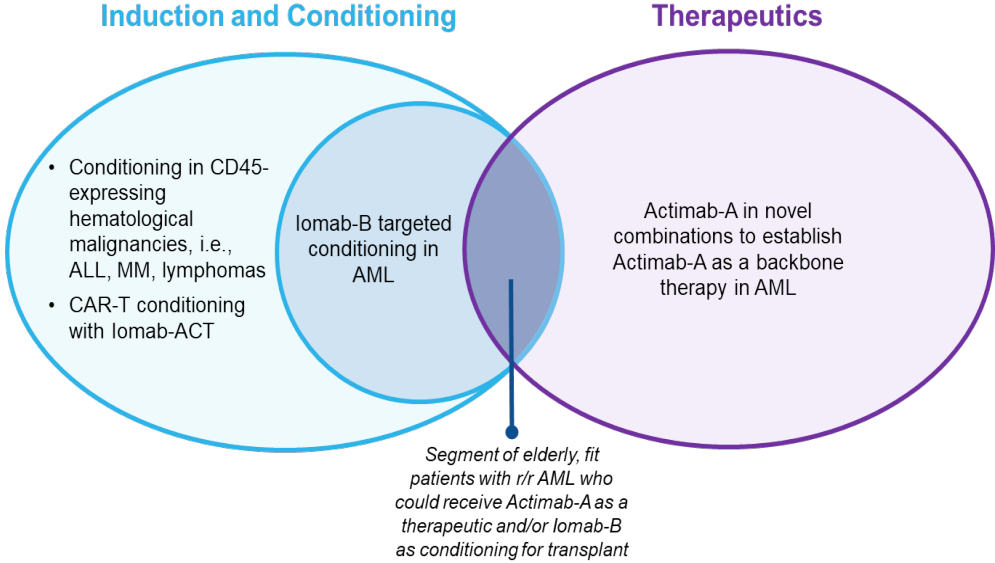


1) Late Breaking Abstract, TCT 2023, Efficacy and Safety Results of the Sierra Trial: A Multicenter, Pivotal Phase 3 Study of Iomab-B Prior to Allogeneic HCT Versus Conventional Care in Older Patients with Active, R/R AML
 2) Abedin et al. Sequential Salvage Chemotherapy and Lintuzumab-Ac225 in Relapsed/Refractory AML Results in Deep Responses and Prolonged Survival in Adverse Risk AML and in AML Patients that Received Prior Venetoclax Therapy. SOHO 2023. Interim data analysis. Final results pending database lock and final analysis.
 3)) Maiti et al. Outcomes of relapsed or refractory acute myeloid leukemia after front-line hypomethylating agent and venetoclax regimens
 4) Zucenka, A., et al. Outcomes of relapsed or refractory acute myeloid leukemia patients failing venetoclax-based salvage therapies. Eur J Haematol. 2020; 106: 105– 1133)

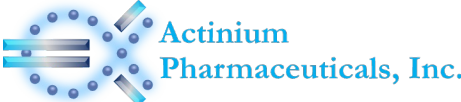
Compelling Market Opportunity for Targeted Radiotherapy in AML

Programs address unmet needs across the patient journey

Potential to address >85K patients in the US & EU5 Alone^{1,2,3,4}



For Illustrative Purposes Only, Not an Estimate of Size



Sources: 1. SEER 2. CancerMPact AML Treatment Architecture US 2022 3. CancerMPact AML Treatment Architecture EU5 2022 4. O. Visser et al, Incidence, survival and prevalence of myeloid malignancies in Europe, 2012; RARECARE



Iomab-B

**CD45 targeted radiotherapy – potential new standard of care
enabling a curative BMT in currently non-transplantable r/r AML
patients with poor survival prognosis**

AML Fast Facts

AML is an aggressive disease that can progress rapidly despite treatments

≈21,000
AML patients
annually in US¹

68 years
Median age at
diagnosis¹

11 drugs
approved for
AML patients
since 2017

Older patients have
limited treatment
options and poor
outcomes



Develop R/R
disease²



of AML patients
access BMT³

BMT is the only
potential curative
treatment
for R/R AML,
but only younger or fit
patients can access it

Better therapeutic options and improved access to BMT are major needs
for r/r AML patients who have poor survival prognosis

1) SEER database; 2) Gyurkocza et al. Allogeneic hematopoietic cell transplantation in patients with AML not achieving remission: potentially curative therapy. Bone Marrow Transplantation (2017), 1-8; 3) Auletta JJ et al. Current use and outcome of hematopoietic stem cell transplantation: CIBMTR US summary slides, 2022.

Challenges to Achieving Cures in AML via BMT

Patients must be able to overcome several challenges related to curative BMT

➔ Challenge #1

Need to attain a complete remission (CR)

➔ Challenge #2

Tolerate and survive effective BMT conditioning

Access

➔ Challenge #3

- Achieve BMT engraftment
- Achieve post-BMT CR

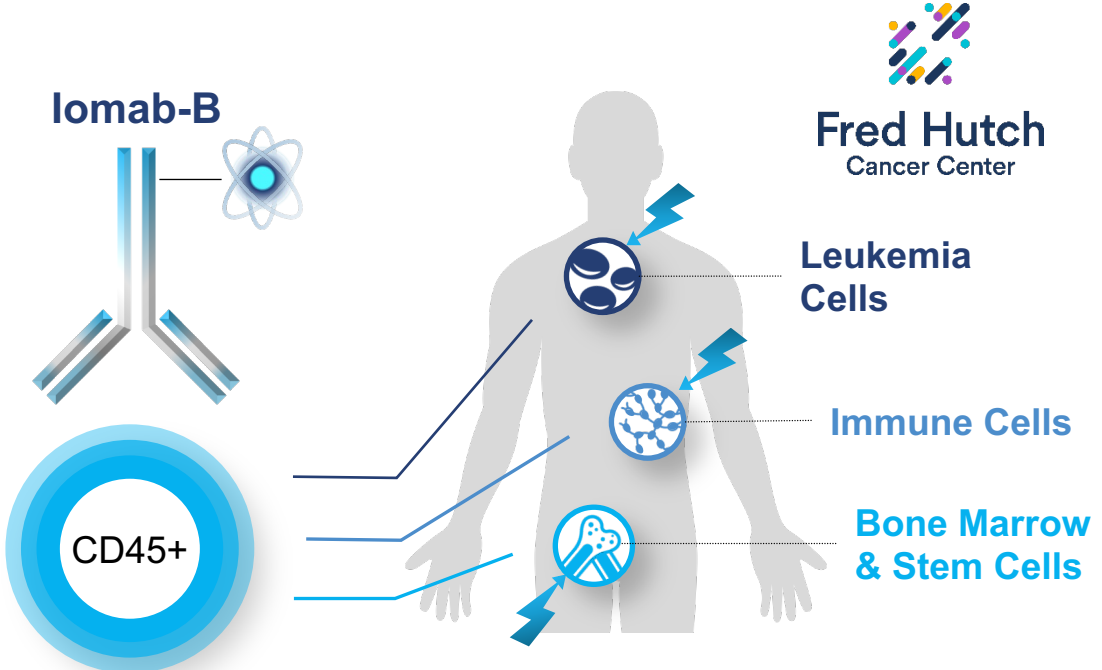
➔ Challenge #4

- Surmount BMT related complications
 - Graft failure
 - Side effects: sepsis, GVHD

Outcomes

Overcoming these challenges can result in long-term survival and curative outcomes

Iomab-B: A Next Generation Approach to Improve BMT Access, Outcomes




400+ patients


12 clinical trials


6 diseases (AML, MDS, MM, ALL, NHL/HL)


Improved survival and curative outcomes

- Iomab-B targets CD45, which has high expression only in AML immune and stem cells, thereby sparing organs and with better tolerability
- Enables high amounts of radiation to be delivered to radiation sensitive AML and immune cells
- Induction and conditioning by simultaneously eliminating targeted cells
- Allows patients with active disease to go directly to BMT rapidly via a single infusion

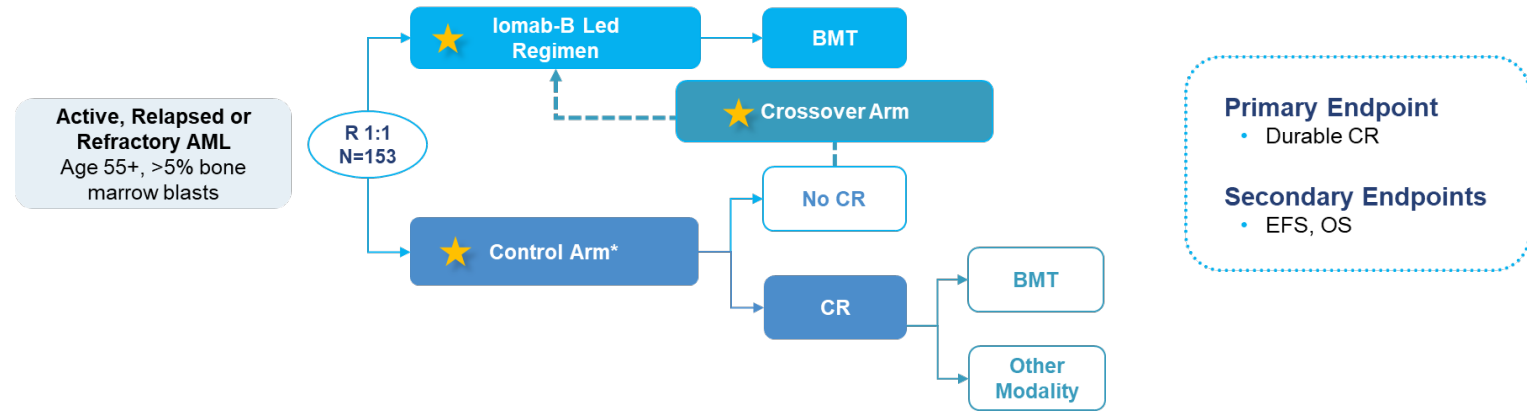
Challenges Addressed: Iomab-B in the SIERRA Trial

- Challenges 1 and 2: Improved Access - CR not needed pre-BMT, effective disease control and targeted myeloablation
- Challenges 3 and 4: Improved outcomes - better post-BMT engraftment, CR and lower complications

SIERRA: A Novel, Pivotal Phase 3 Study of Iomab-B in R/R AML

3 Novel Components of SIERRA Design

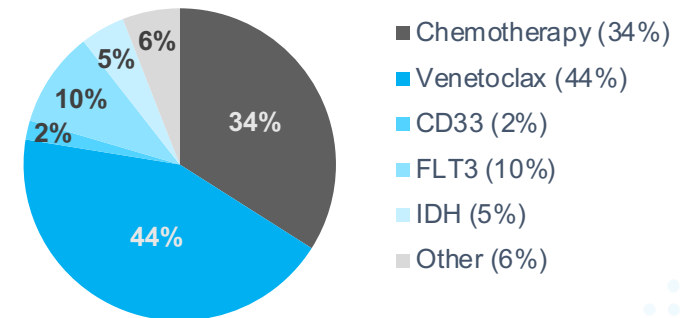
- ★ **Iomab-B**
Patients with active disease can go immediately to BMT
- ★ **Control**
≈20 agents that include CT/ targeted therapies allowed – anything to get patient to CR and subsequent BMT
- ★ **Crossover**
Patients with treatment failure can be rescued on Iomab-B arm



SIERRA Trial: Iomab-B Arm Patient Characteristics

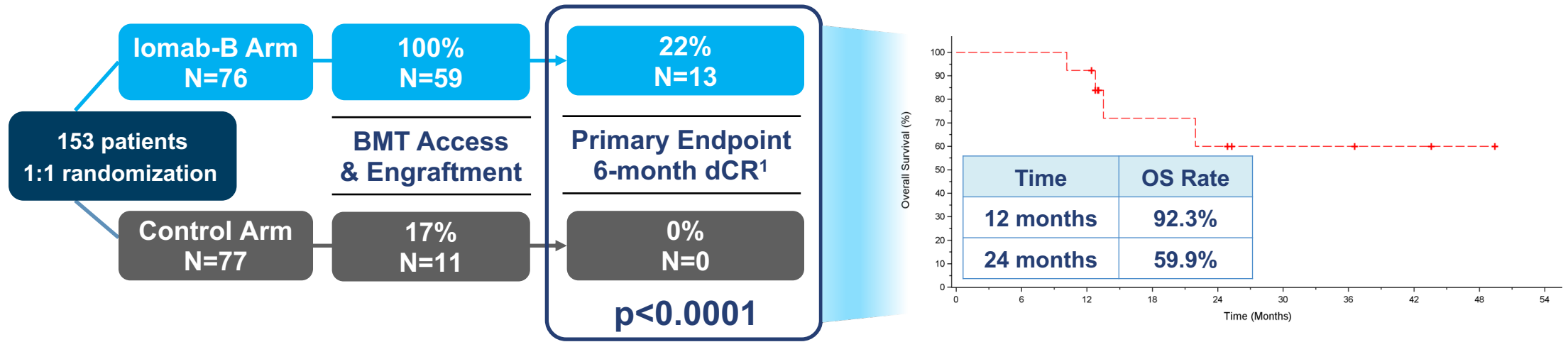
- Median age: 64 (55-77)
- Intermediate and adverse cytogenetics and molecular risk: >90%
- Majority of patients had primary induction failure or first early relapse: 78%
- Median blast count: 30%
- Prior lines of treatment: 3 (1-8)

SIERRA Patients Had Significant and Diverse Prior Therapy Representative of Current AML Treatment



SIERRA Results: Iomab-B Overcomes Key BMT Challenges

Primary endpoint met with high significance: High rates of post-BMT remissions resulted in significantly higher durable remissions with Iomab-B



Median OS not reached in patients achieving the primary endpoint; 2-year survival highly indicative of long-term outcomes including potential cure

Iomab-B patients were only allowed limited opportunity for maintenance therapy, which is not the norm

SIERRA Results: Iomab-B Improves Patient Outcomes

100% BMT Access in Half the Time

	Time to BMT	BMT & Engraftment %
Iomab-B	29 Days	100%
Control Arm	66.5 Days	17%

Improved Outcomes Across All Efficacy Measures

Post-BMT CR Rate	Durable Complete Remission ¹	1-Year Overall Survival	Event Free Survival ¹
75%	22% (p>0.0001)	26.1%	28% (HR=0.22)
6.3%	0%	13.1%	0.2%

Excellent Safety and Tolerability of Targeted Radiotherapy

Sepsis	Febrile Neutropenia	Mucositis	Acute GHVD Gr II-IV
6.1%	43.9%	15.2%	26.1%
28.6%	50.0%	21.4%	35.7%

✓
Addresses Clear Unmet Need

✓
Improved Access

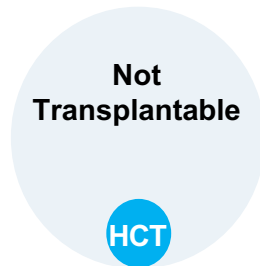
✓
Improved Outcomes

✓
Well Tolerated

*Highly restrictive protocol limited optionality for maintenance therapy in Iomab-B patients
 1) EFS at 180 days

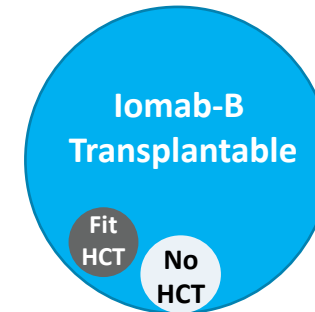
Iomab-B – New Paradigm To Upend BMT Access, Improve r/r AML Outcomes

Current BMT Practice: Low Access, Poor Outcomes



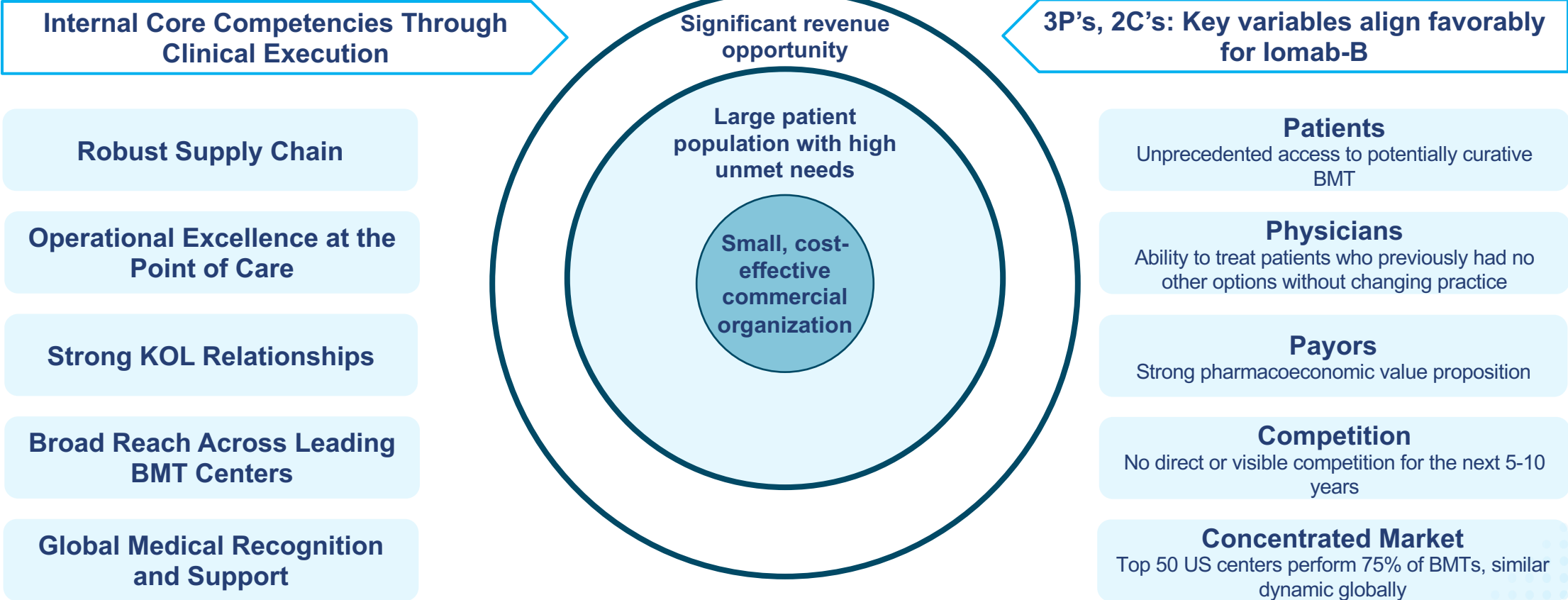
- Majority of patients are not transplantable
- <5% or ~400 r/r AML patients who are fit enough to achieve remission receive HCT¹

Iomab-B's Paradigm Changing Potential: Unprecedented Access, Survival Benefit, Cure



- Majority transplantable. ~8,000 patients HCT eligible with Iomab-B²
- Iomab-B bridging plus myeloablative conditioning is tolerable by unfit, high-risk, heavily pre-treated R/R AML patients who are currently offered palliative care with poor survival prognosis

Favorable Dynamics Support Specialty Radiopharmaceutical Vision



Significant Contribution from EUMENA Opportunity

Attractive EUMENA market opportunity due to favorable market dynamics, timing of entry and lucrative partnership economics from Immedica AB

Favorable Dynamics in EUMENA for Iomab-B

- Positive Scientific Advice from EMA, SIERRA trial can support a marketing authorization with filing expected in 2024
- EU Orphan Designation
- Immedica has strong regulatory and commercial capabilities in the EUMENA region
- Positive alignment of 3Ps and 2C's similar to U.S.
- Immedica AB collaboration highlights: \$35 million upfront, \$417 million potential milestones, mid-twenty percent royalties

~7,200 BMTs for AML in EUMENA (2x U.S.) performed in concentrated number of centers



Large BMT Opportunity with Favorable Commercial Dynamics Globally

Number of BMTs performed globally doubled in 10 years with strong continued growth



Proportion of BMTs by Region^{1,2}

- Consistent commercial dynamics globally with select leading BMT centers treating a majority of patients in each country/region
- Estimated ~70,000 allogeneic BMTs performed worldwide¹
- U.S. Represents ~20% of allogeneic BMT volume
- EU has strong and established BMT community and performs the most all BMTs of any region
- Asia-Pacific has the fastest growth rate and is rapidly emerging
- AML represents ~40% of allogeneic BMTs in the U.S. and is the largest segment

Clear Pathway to Establishing Iomab-B as Standard of Care

Significant Upcoming Iomab-B Milestones



8 Oral Presentations at Global Hematology and BMT conferences in 2023 with 2 additional oral presentations in 2024



400+ patients **6 disease indications** (AML, MDS, MM, ALL, NHL/HL) **Improved survival and curative outcomes**

These data, together with the pivotal Phase 3 SIERRA trial will be leveraged to further expand Iomab-B's role in indications representing tens of thousands of patients with R/R disease with similar unmet needs to patients in SIERRA

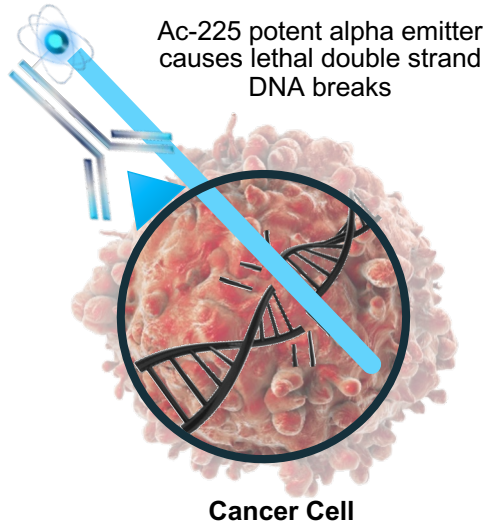


Actimab-A

CD33 targeting radiotherapeutic – mutation agnostic/resistant mechanism has potential as combination backbone therapy in highly radiosensitive, mutation rich AML

Actimab-A Program Overview

CD33 targeting antibody -
CD33 expressed on virtually
all AML cells



Ac-225 potent alpha emitter
causes lethal double strand
DNA breaks

Cancer Cell

**Precision Targeting
Against Validated CD33
Antigen**

**Mutation Agnostic,
Mutation Resistant
Mechanism of Action**

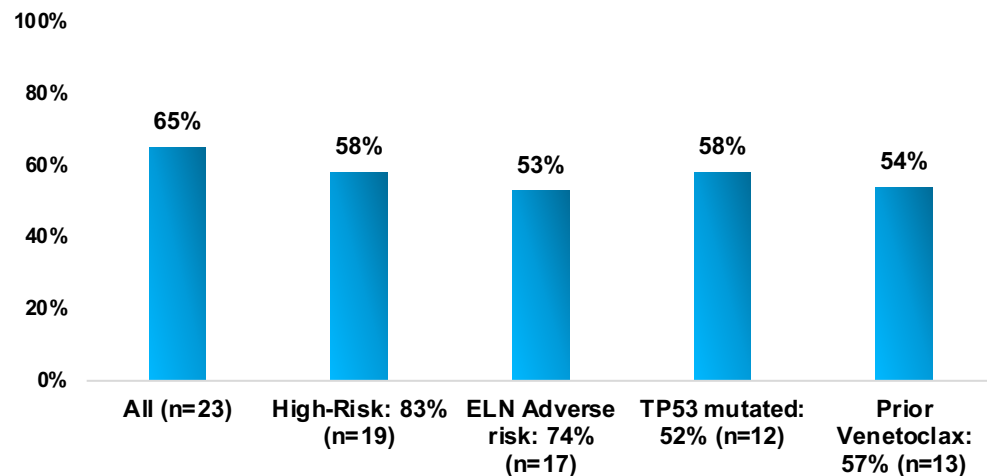
**Opportunity to Develop Actimab-A as
Combination Backbone for Practically all
AML patients**

- Actimab-A – antibody linked to Ac-225 alpha emitter targets validated CD33 antigen in a highly precise manner
- Clinical experience in ~150 AML patients across 6 clinical trials is also most developed Ac-225 program
 - Actimab-A clearly demonstrated high potency and minimal non-hematologic toxicities >grade 3 outside of myelosuppression in Phase 1/2 POC trial
- Current trials and research programs combine Actimab-A’s potent cell killing power and demonstrated safety at lower doses with other treatment modalities
- Objective is to exploit the mutation agnostic mechanism of action of Ac-225 and radiosensitivity of AML cells to provide enhanced clinical benefit in this heterogenous disease
- Actimab-A + CLAG-M combination trial results provide strong validation of promise of this approach
- Multiple opportunities to use Actimab-A in combination with chemotherapy, targeted agents and immunotherapy are being explored. Recent NCI CRADA is expected to accelerate development

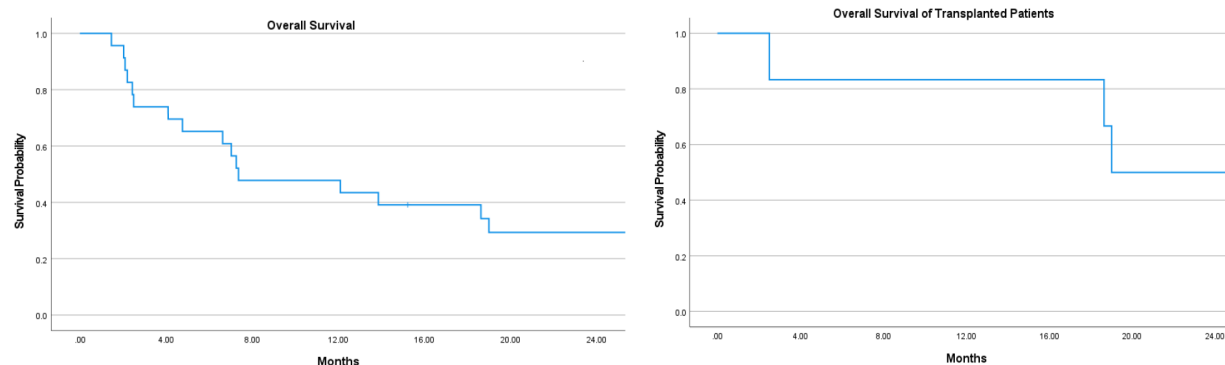
Actimab-A + CLAG-M: Impressive Outcomes In Heavily Pretreated R/R AML

Actimab-A + CLAG-M Patient Characteristics

- Median of 2 lines prior therapy
- 57% prior BMT, 57% prior venetoclax
- 74% ELN Adverse Risk disease
- 52% TP53 mutations



Improved Survival Outcomes¹



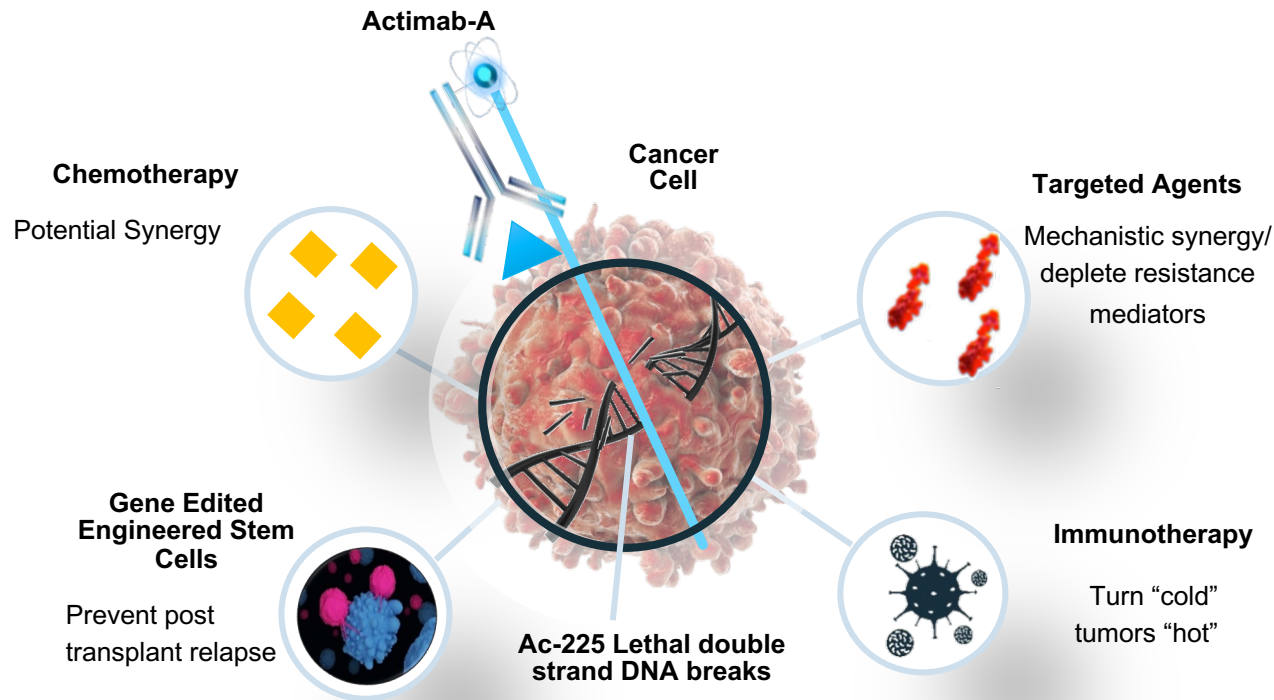
Patients	ORR	MRD Negativity	1 year OS
All (n=23)	65%	75%	48%
High-Risk (n=19)	58%	75%	42%
ELN Adverse Risk (n=17)	53%	67%	35%
TP53 mutated (n=12)	58%	80%	42%
Prior VEN (n=13)	54%	100%	46%

64% of eligible patients proceeded to transplant

Median survival of transplanted patients 24 mos.

Actimab-A Development Bolstered By Recent NCI CRADA

NCI sponsored Actimab-A development to include Phase 1, 2 and 3 trials with the potential to develop Actimab-A as a backbone of AML combination therapy



- CRADA provides access to 2,000 clinical trial sites in Experimental Clinical Trial Network – ECOG, SWOG and Alliance as well NCI's MyeloMATCH program
- Actinium to review and approve trials and protocols with NCI and has rights to all data
- Enables broad and aggressive development as single agent and combination-backbone

Balance sheet sparing with full rights to data – Actinium supplies Actimab-A while NCI covers all clinical trial execution and development expenses

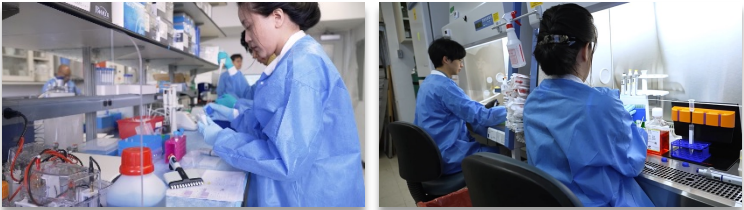


R&D, Technology and Core Capabilities

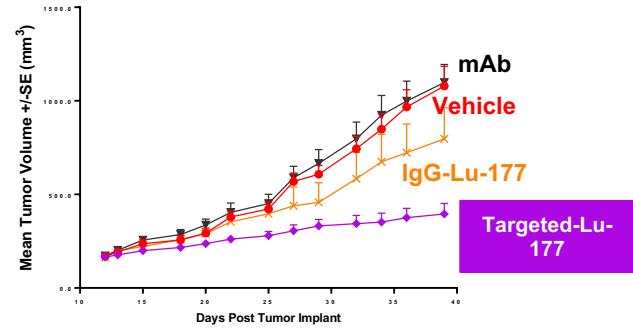
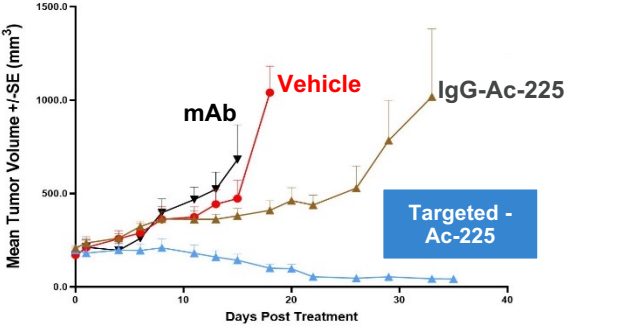
In-house R&D capabilities, strong IP portfolio including patents and know-how for Ac-225 production and proven supply chain provide foundation for continued future growth

Proven R&D Capabilities Support Leading Edge Innovation

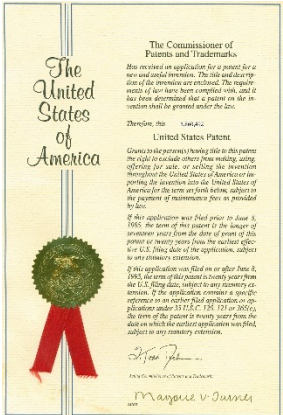
Actinium R&D lays the foundation for successful partnerships from IP protection to efficacy data



Modern labs with end-to-end support capacity



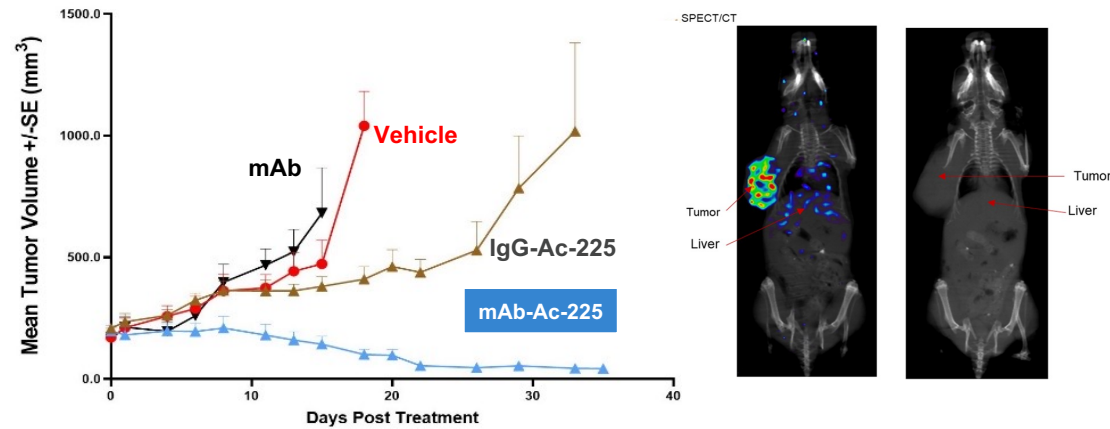
Translational Research Excellence



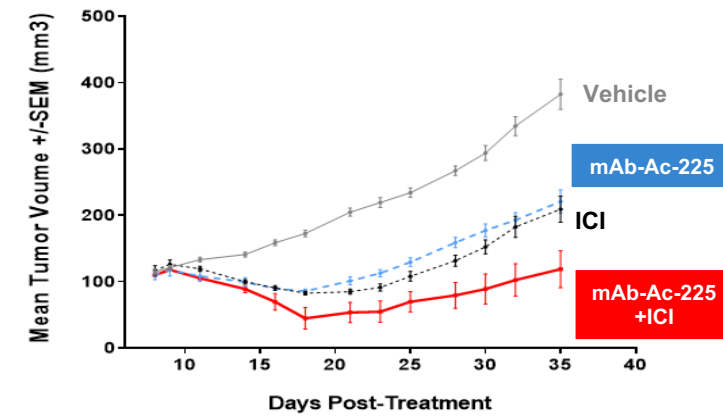
220+ Patent Intellectual Property Portfolio

Actinium's Technology Validated in Both Liquid and Solid Tumors

Targeted Ac-225 in NSCLC Model

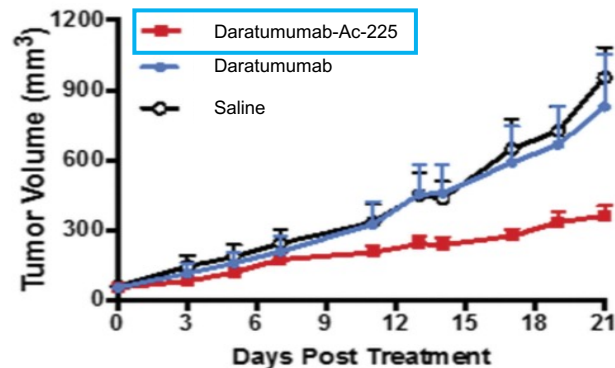


Targeted Ac-225 in Breast Cancer Model

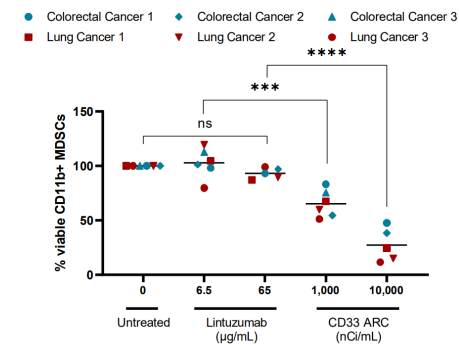


Daratumumab-Ac-225 in Multiple Myeloma

Xenograft model



MDSC Depleting CD33-Ac-225



Cancer patient ex vivo MDSC depletion

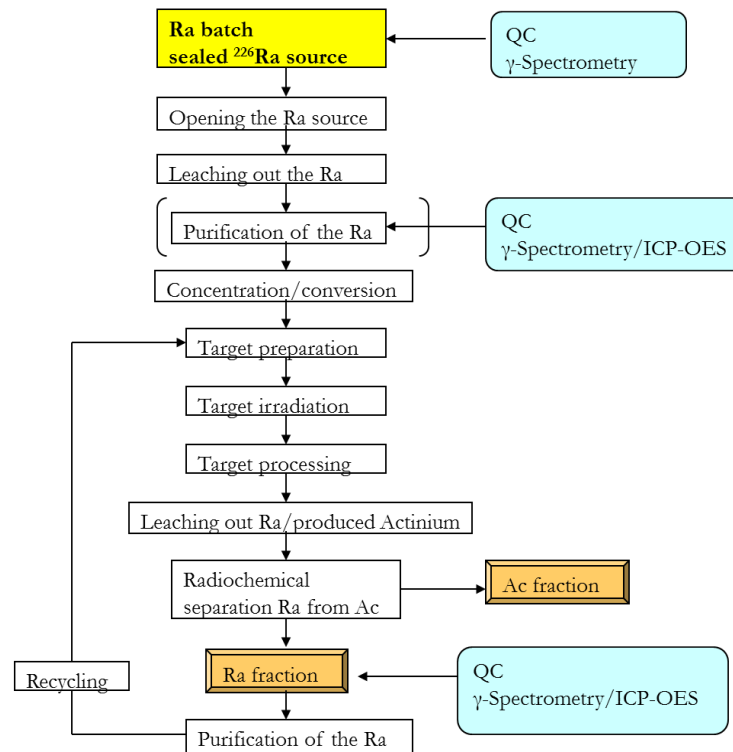
Actinium Pioneered Ac-225 Cyclotron Production, Holds IP, Know-How

ATNM's patented technology has been successfully used to produce Ac-225 identical to that from a thorium cow

Key Factors	Production Routes for Ac-225	
	Th229 generator $^{229}\text{Th} \rightarrow ^{225}\text{Ac}$	Proton method $^{226}\text{Ra}(p,2n)^{225}\text{Ac}$
Feasibility	Supply in place ●	Existing production ●
Scalability	Low/None ●	High ●
Vulnerability to interruptions	Low ●	Medium if single cyclotron ●
^{226}Ra dependent	No ●	Yes ●
^{227}Ac contaminant	No ●	No ●
Equipment / Facility required	Thorium cow ●	Medium energy cyclotron(s) ●

<p>● No issues identified</p> <p>● Scalable solutions in progress</p> <p>● Ability to address key factor to be determined</p> <p>● Factor limiting scalable supply</p>	<p>Current supply for majority of Ac-225 programs</p>	<p>Scalable supply through ATNM's patented technology</p>
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ATNM's Production Process Flow

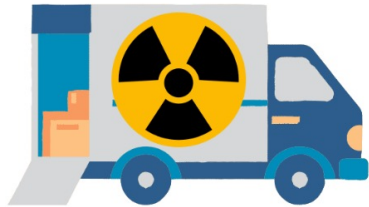


- ATNM has 5 US issued patents and 49 Ex-US patents on Ac-225 production covering:

- Methods of purification and recycling of Ra-226 from a variety of different sources
- Target design and preparation of Ra-226 targets for proton irradiation via a cyclotron
- Methods of purification of 99.7% pure Ac-225 from irradiated Ra-226 targets free of Ac-227

Proven Radiotherapeutic Supply Chain Excellence

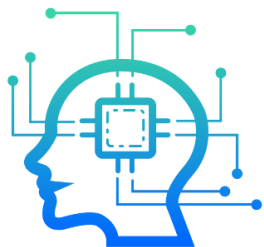
Actinium has dosed hundreds of patients with targeted radiopharmaceuticals and built key expertise regarding management of the demanding radiopharmaceutical supply chain



Proven ability to deliver “just in time” radiotherapeutics



Established redundant supply for radioisotopes



Strong IP & know-how to produce Ac-225



- >500 patients dosed in ~18 clinical trials
- Proven supply capabilities as evidenced by not a single missed dose
- Robust supply chain established in over 45 large cancer hospitals



- Expert technical operations team experienced with facility design and buildout
- Scalable, flexible and commercially viable manufacturing operations in place to support U.S. and international commercial sales

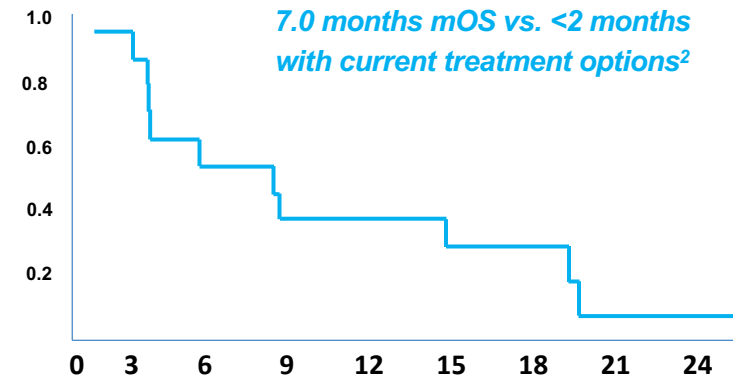
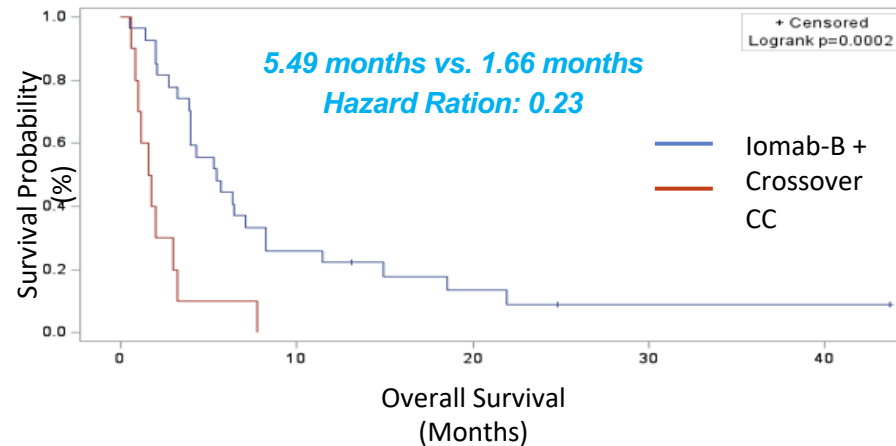


AML Opportunity & Milestones

Opportunity for Actinium to radically improve outcomes of r/r AML patients by launching two radiotherapy drugs in 5 years that address significant unmet therapeutic and transplant needs and create significant value

Producing Positive Outcomes in TP53+ Where Other Modalities Cannot

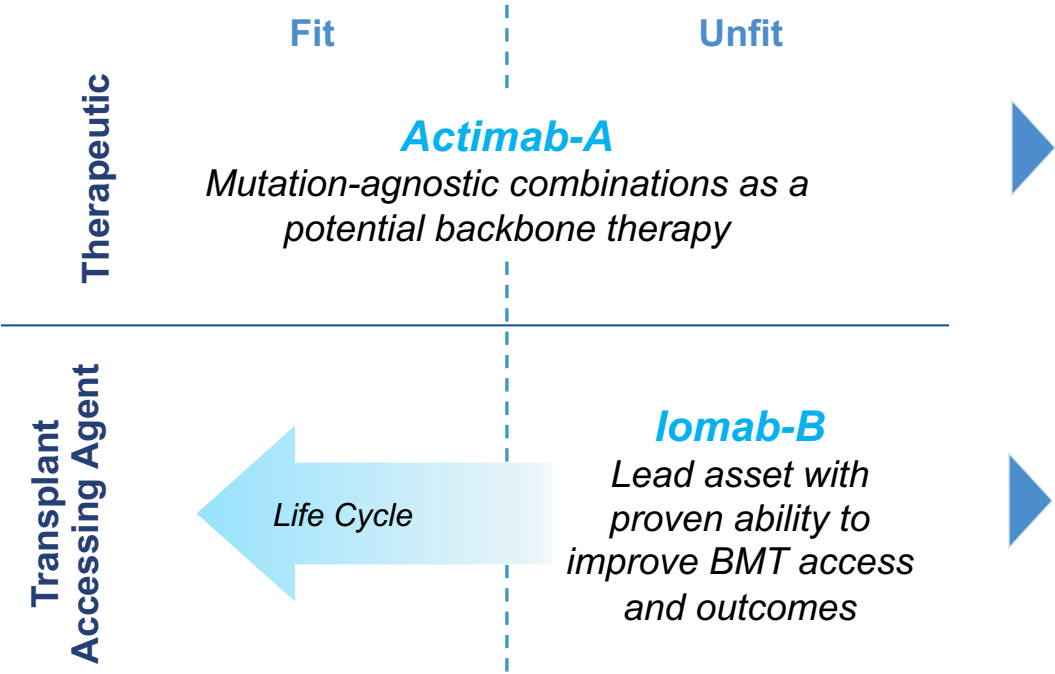
Mutation agnostic mechanism support by clinical trials showing both of Actinium's targeted radiotherapies are effective against TP53 mutation; the most commonly mutated gene in all human cancers¹



	Phase 3 SIERRA Trial	Actimab-A + CLAG-M Phase 1b	AML
TP53 mutation rate	24%	53%	5-15% of all patients and up to 25% of elderly patients
mOS in TP53+ patients	5.49 months	7 months; 26 months in patients proceeding to BMT	<2 months in R/R patients

Actinium's Opportunity to Transform Treatment Outcomes in AML

Iomab-B and Actimab-A together afford Actinium the unique opportunity to significantly modify the dismal status quo in AML in a complementary manner



- Actinium's Ability to Deliver on this Opportunity**
- Addressable patient population >50% R/R with dismal outcomes
 - Patient population largely treated in top 100 quaternary care centers
 - Favorable commercial dynamics for a successful Iomab-B launch with a lean commercial organization
 - Operational excellence at the point of care and efficient supply chain

Our mission is to deliver on the promise to modify AML outcomes and create a highly differentiated, specialty radiotherapeutics company focused on the top 100 hospitals

Upcoming Value Creating Milestones

Program	Milestone	Status & Timing
Iomab-B	Positive Phase 3 SIERRA Results	✓
	ASH Oral Presentation: Iomab-B improves outcomes for patients with TP53 gene mutation	✓
	BLA/MAA Filing	1H/2H:2024
	US/EU Early Access Program	1H/2H:2024
	Life Cycle Management Initiatives	2H:2024
Actimab-A	Positive Survival Results in Actimab-A CLAG-M Combination Study	✓
	Secure CRADA with NCI for Broad Development of Actimab-A & Pivotal Trial Update	✓
	Finalize Plan for Registrational Trial of Actimab-A + CLAG-M	1H:2024
	Updated Data from Actimab-A Venetoclax Combination Study	✓
Iomab-ACT	POC Data from MSKCC/NIH Clinical Trial	2024
	CAR-T Development Strategy Update	2024
	Gene Therapy Proof of Concept Data/Secure Development Partner	2024
R&D	Advance Ongoing Collaborations and Additional Collaborators	Ongoing



Thank you

Actinium Pharmaceuticals, Inc.

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