Actinium Pharmaceuticals, Inc.

Actimab-A MRD

Consolidation Strategy in MRD+ AML

July 10, 2018

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Today's Speakers

Dr. Joseph Jurcic

Director of Hematologic Malignancies; Professor of Clinical Medicine

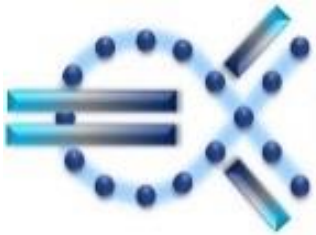
COLUMBIA UNIVERSITY MEDICAL CENTER

Sandesh Seth

Chairman & CEO

Dr. Mark Berger

Chief Medical Officer



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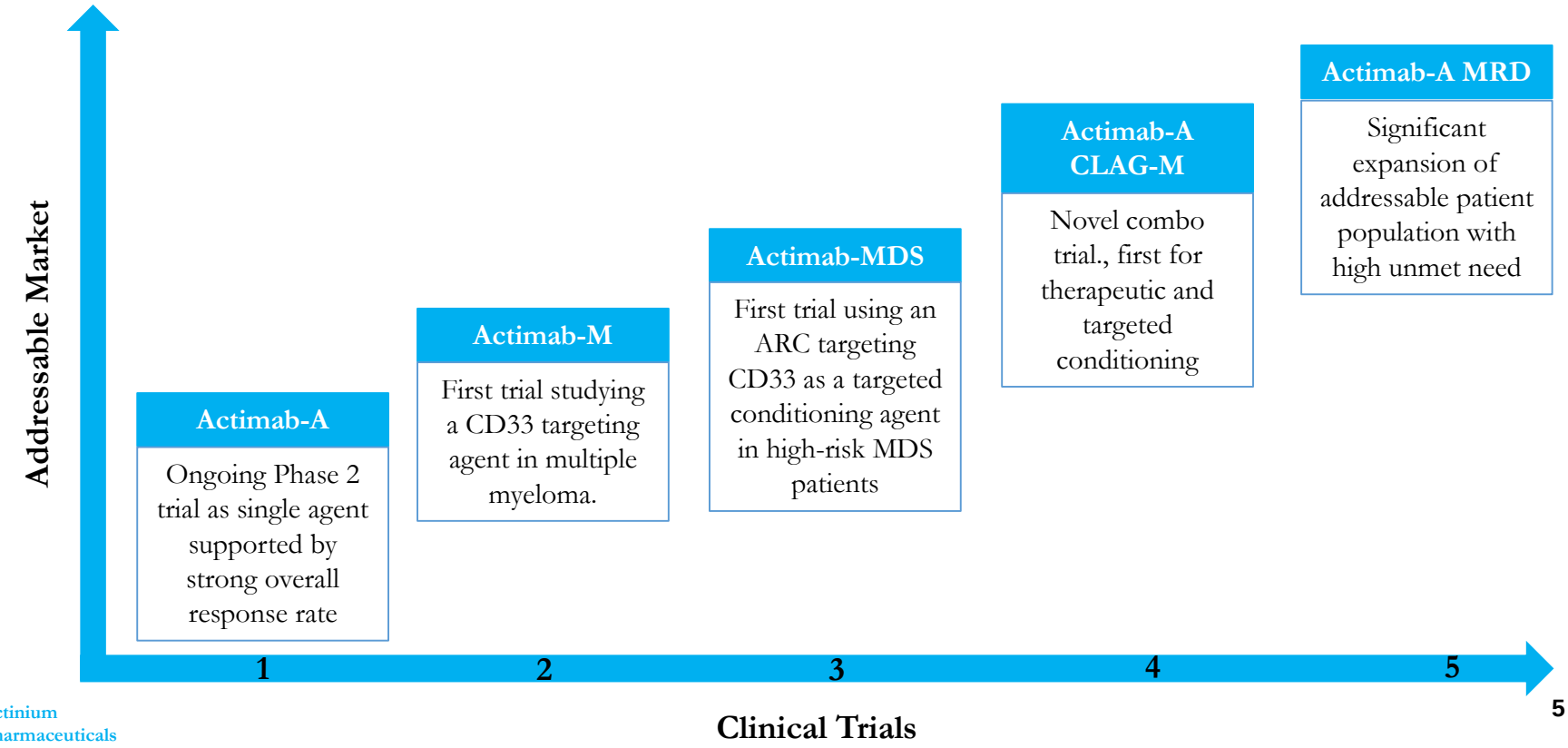
Agenda for Today's Call

Progressing and Expanding CD33 Program

- Only multi-disease, multi-indication CD33 program - 5 trials in 3 diseases
- Expansion enabled by highly differentiated Antibody Radio-Conjugate (ARC) technology
- Broadening of program driven by interest from and in collaboration with key opinion leaders

CD33 Program Building Strategically to Maximize Value

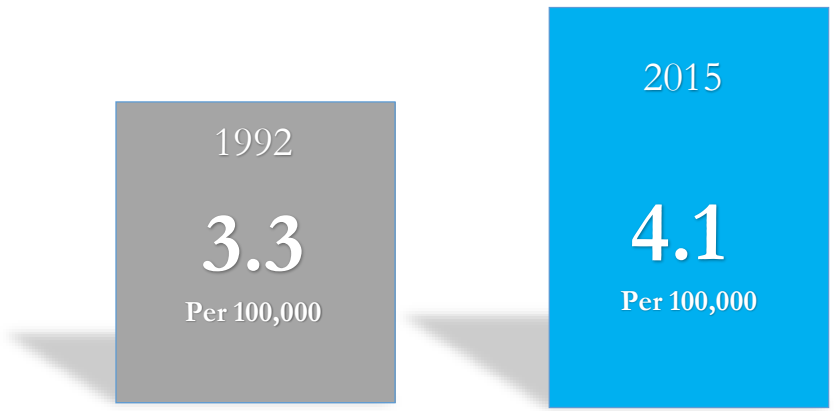


II. Acute Myeloid Leukemia (AML) overview

Acute Myeloid Leukemia At A Glance

AML WW Incidence[1]	2018 New Cases (US)[2]	Average Age of AML Patient[3]
351,965	21,000	68

AML Incidence Per Year[4]

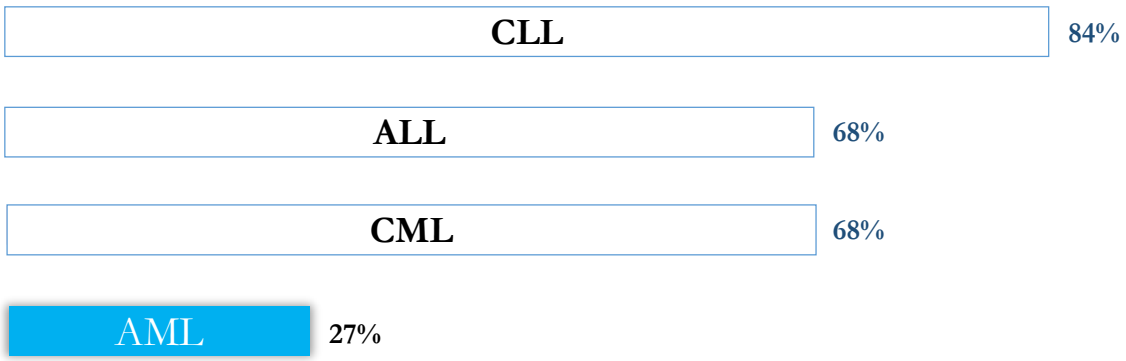


1) WHO and GLOBOCAN (https://gco.iarc.fr/databases.php). 2012
2) https://www.seattlecca.org/diseases/acute-myeloid-leukemia-aml/aml-facts
3) American Cancer Society 2018 – Key Statistics for Acute Myeloid Leukemia
4) https://www.ncbi.nlm.nih.gov/pubmed/17019734 Deschler et al., 2006 and Jemal A et al., 2002

The Challenge of Acute Myeloid Leukemia

5-year survival[1]	% of Older Patients Achieve Complete Remission[2]	% of Younger Patients Achieve Complete Remission[2]	Relapse Rate[3]
27.4%	40-50%	60-80%	50-70%

5-year OS shows need for better AML treatment



AML has among the lowest 5-year survival rate of blood cancers
Most AML patients will relapse

1) WHO and GLOBOCAN (https://gco.iarc.fr/databases.php). 2012
2) Mangan and Luger. Salvage Therapy for Relapsed or Refractory Acute Myeloid Leukemia. Therapeutic Advances in Hematology April 2011, 73 – 82.
3) Venditti et al. Level of Minimal residual disease after consolidation therapy predicts outcomes in acute myeloid leukemia. Blood 2000 96: 3948-3952

Challenges We Are Addressing In AML

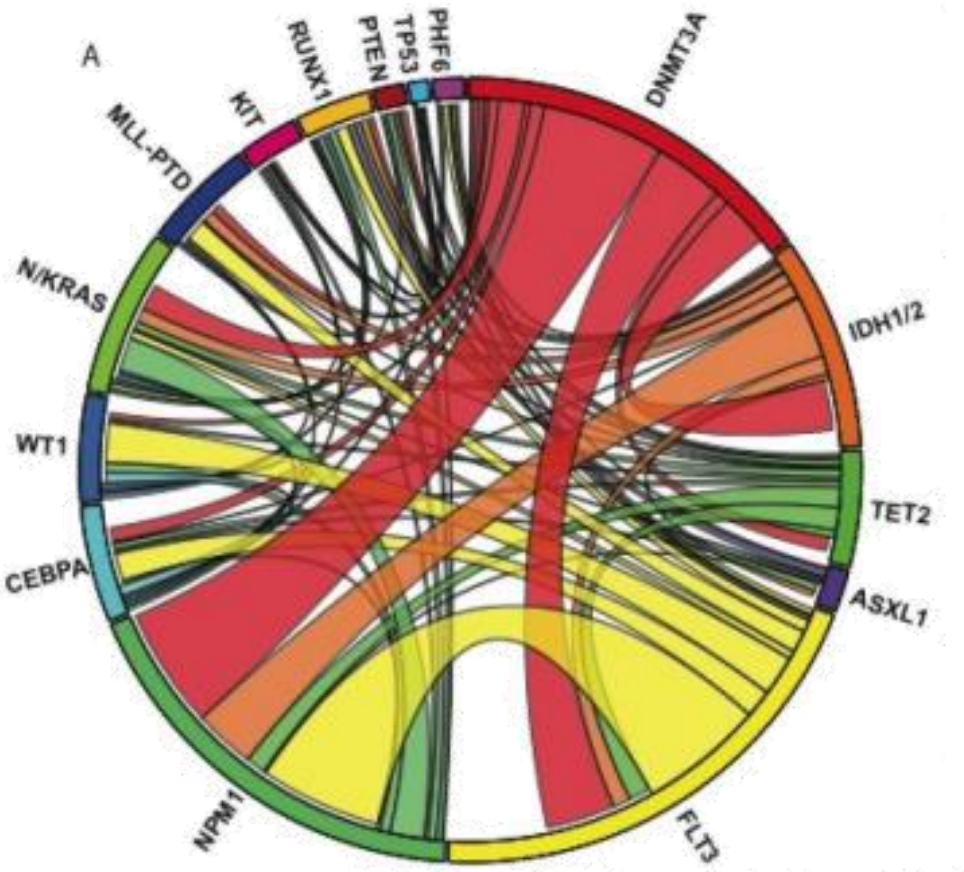
Difficult to Treat Population

72.9% of patients diagnosed over the age of 55[1]

1) National Cancer Institute, Surveillance, Epidemiology, and End Results Program (SEER) https://seer.cancer.gov/csr/1975_2014/browse_csr.php?sectionSEL=13&pageSEL=sect_13_table.16.html#table3

Challenges We Are Addressing in AML

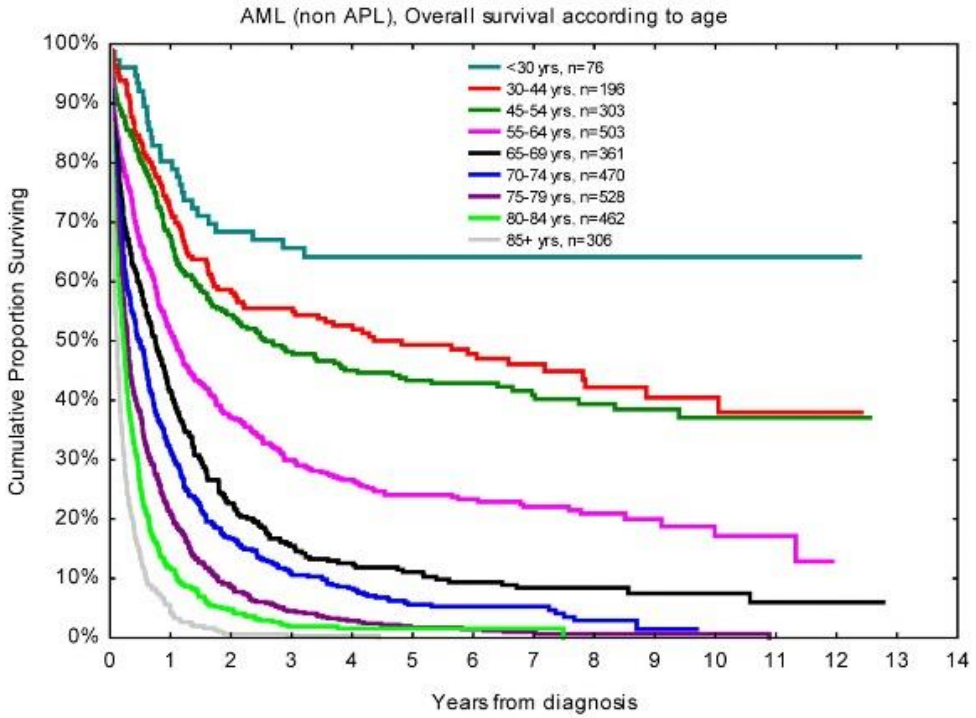
Molecular Heterogeneity & Mutational Complexity



Patel et al. NEJM 2012

Challenges We Are Addressing In AML

High Relapse Rates & Poor Survival

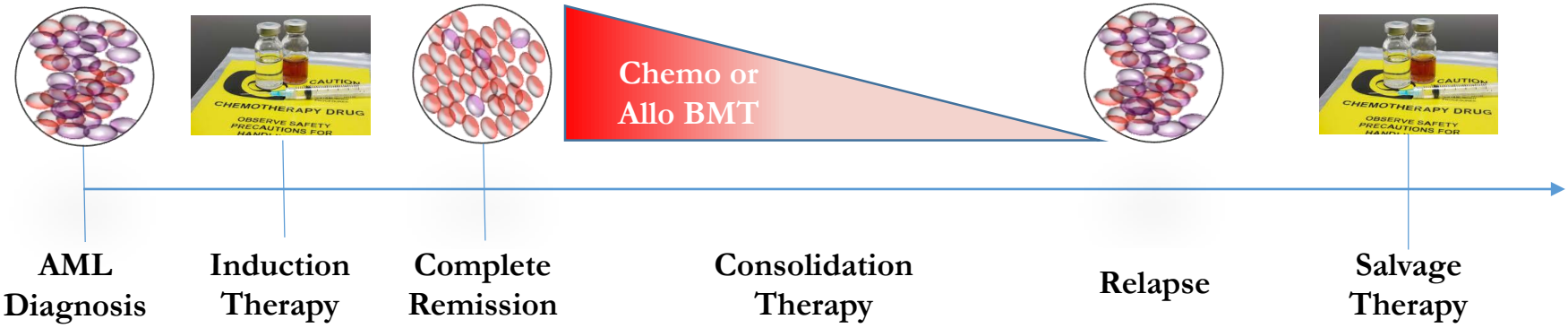


- High relapse rates result in poor survival prognosis
- 1-year survival < 30% for all patients with relapsed AML
- Speed of relapse also results in a poor survival prognosis

1) Juliusson et al. Acute myeloid leukemia in the real world: why population-based registries are needed. Blood April 2012. Volume 119, Number 17. 3890 - 3899

AML Disease Progression and Treatment Paradigm

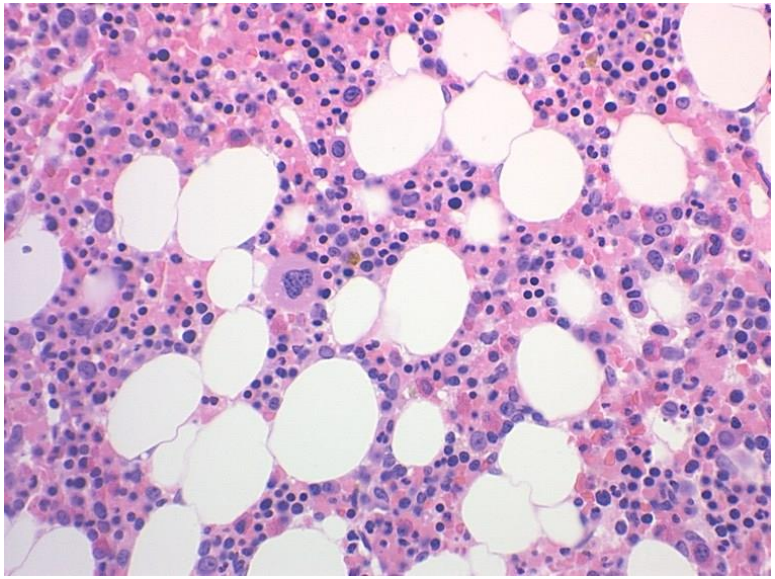
AML Patient Journey



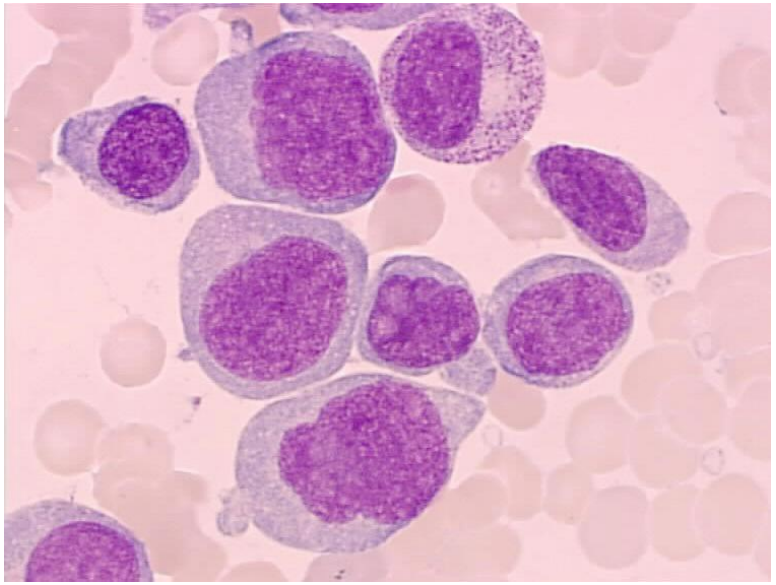
AML Disease Treatment Strategy

Goal of Induction Therapy

Induce Complete Remission (CR)[1]



Normal Marrow



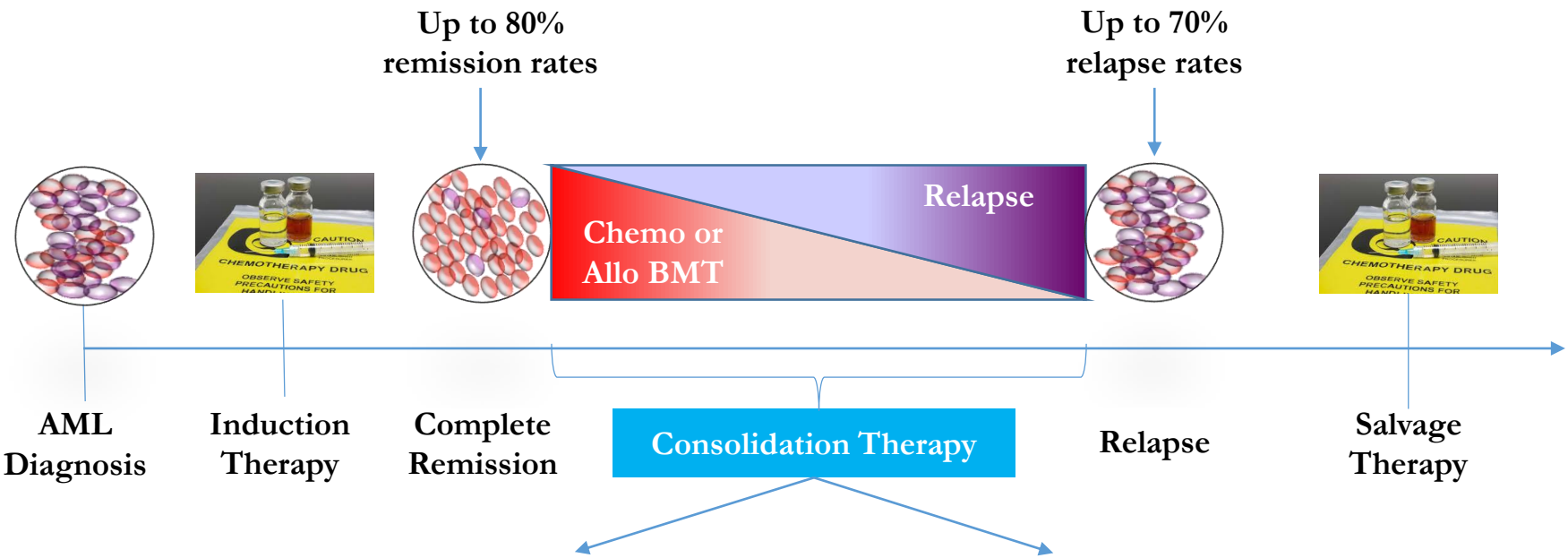
AML Blasts

Detectable disease is still present, relapse is almost certain if left untreated thus the need for consolidation treatment

1) CR: Modified response criteria defined by International Working Group: (1) a bone marrow with < 5% blasts with no Auer rods present; (2) no extramedullary disease (e.g., soft tissue or CNS involvement), and (3) the absolute neutrophil count (ANC) > 1000/μL, platelet count must be ≥ 100,000/μL, and subject must be independent of transfusions for 14 days.

AML Disease Progression and Treatment Strategy

High relapse rates after CR and consolidation therapy indicate need for improved consolidation treatment



Patient <60 yrs. old

- HiDac - High Dose Cytarabine
- Midostaurin (FLT3+ patients)
- HCT (Int/poor-risk patients)

Patient >60 yrs. old

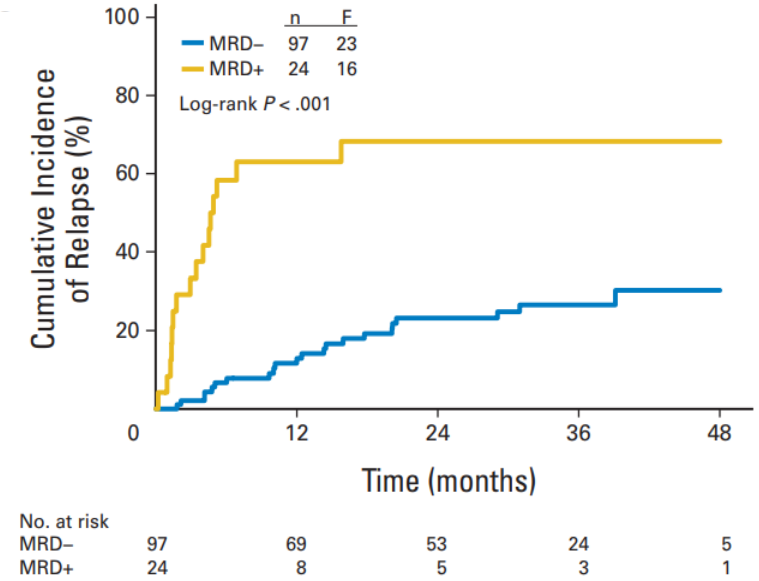
- Hypomethylating agent
- Reduced Intensity SCT
- Best Supportive Care

III. Beyond CR – The Significance of Minimal Residual Disease in AML

Impact of MRD Status on Relapse Rates

- MRD status shown to be significant factor in rates of relapse[1]
- Many patients did not receive consolidation treatment after 2 cycles of induction therapy due to poor condition, slow recovery or early relapse.
- Almost all patients not receiving consolidation relapsed
- Points to need for effective and tolerable therapy for MRD+ AML patients

MRD Status and Relapse Rates following Consolidation Therapy

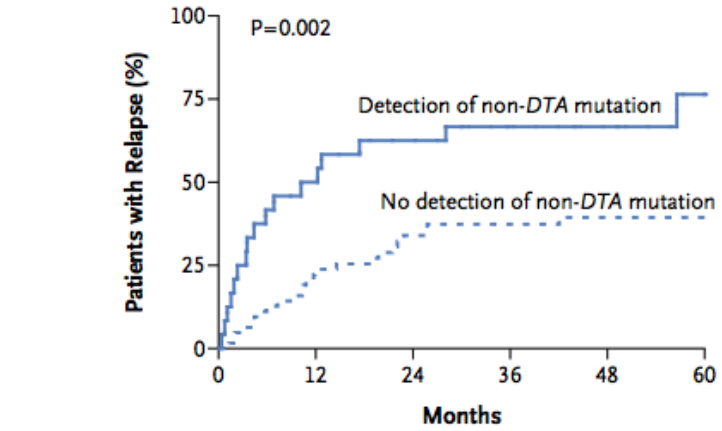


1) Terwijn, Monique, et al. High prognostic impact of flow cytometric minimal residual disease detection in acute myeloid leukemia: data from the HOVON/SAKK AML 42A study. Journal of Clinical Oncology, 2013, vol. 31, no. 31, p. 38889-97

Genetic Mutations Persist in MRD Patients

- Testing has demonstrated that one half of AML patients in complete remission have persistent mutations
- Specific mutation types detected during CR were associated with increased risk of relapse and reduced survival over 4 years

Persistent Mutations Drive Relapse

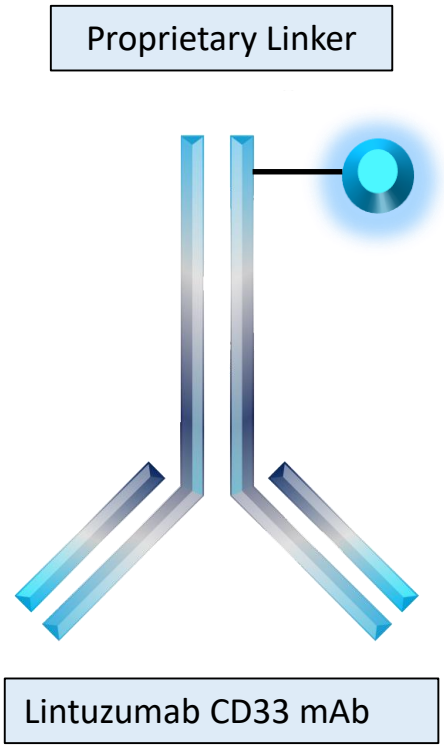


No. at Risk						
Detection	24	11	8	5	4	2
No detection	63	45	33	29	22	17

1) Jongen-Lavrencic 2018

IV. Actimab-A for MRD+ Patients and Planned Trial

Actimab-A's Differentiated Abilities



Properties of Actinium-225[1]

- High linear energy transfer – 5-8 MeV
- Short path length - 50 – 80 microns

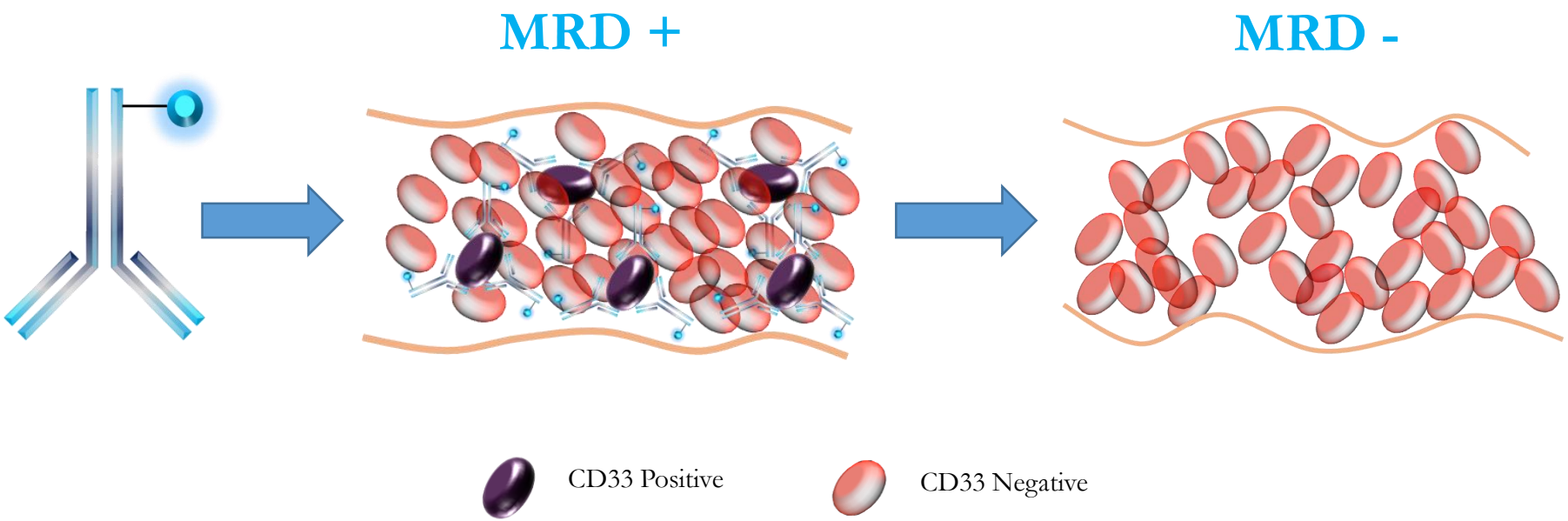
Advantages of ARC approach:

- No internalization required
- No known resistance mechanism
- Simple outpatient infusion administration
- Novel mechanism for radiation sensitive cancers
- Favorable safety profile in over 100 patients to date
- Very high potency
- Tolerable to "unfit" patients

1) Sgouros et al. Radiobiology and Dosimetry of a-Particle Emitters for Targeted Radionuclide Therapy. The Journal of Nuclear Medicine 2010; 51:311–328

Actimab-A – Molecular Surgery for MRD

- Low disease burden level is ideal for Actimab-A
- Potency of Ac-225 allows less drug to be given
- Well tolerated with little to no extramedullary toxicities
- Targeted delivery of Ac-225 expected to be effective against remaining CD33+ cells



Actimab-A MRD Trial

Trial Overview:

- Phase 1, 3+3 dose-escalation trial
- 4 – 18 patients, 12 patients expected
- AML patients in 1st, 2nd or 3rd CR or CRp with detectable minimal residual disease after completing all planned therapy

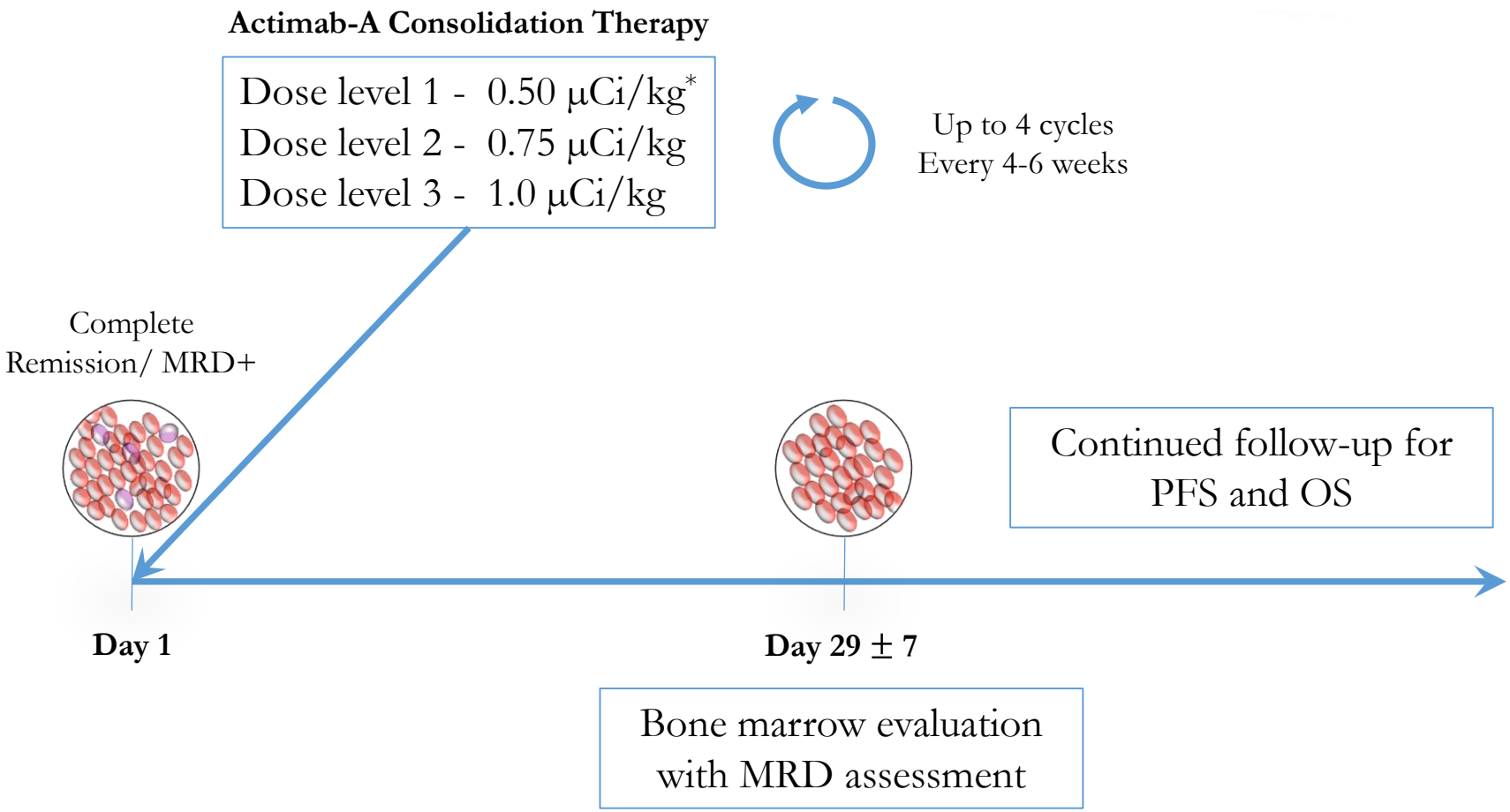
Primary Objectives:

- Safety/tolerability and establish maximum tolerable dose (MTD)

Secondary Objectives:

- Effect on MRD
- Progression Free Survival (PFS) post remission
- Overall Survival (OS)

Actimab-A MRD Trial Design



* If DLT seen at 0.50 µCi/kg then will go to 0.25 µCi/kg

Expected Regulatory Pathway Forward

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Columbia University Medical Center

Phase 1

- Safety - MTD
- Efficacy – Impact of MRD & PFS/OS

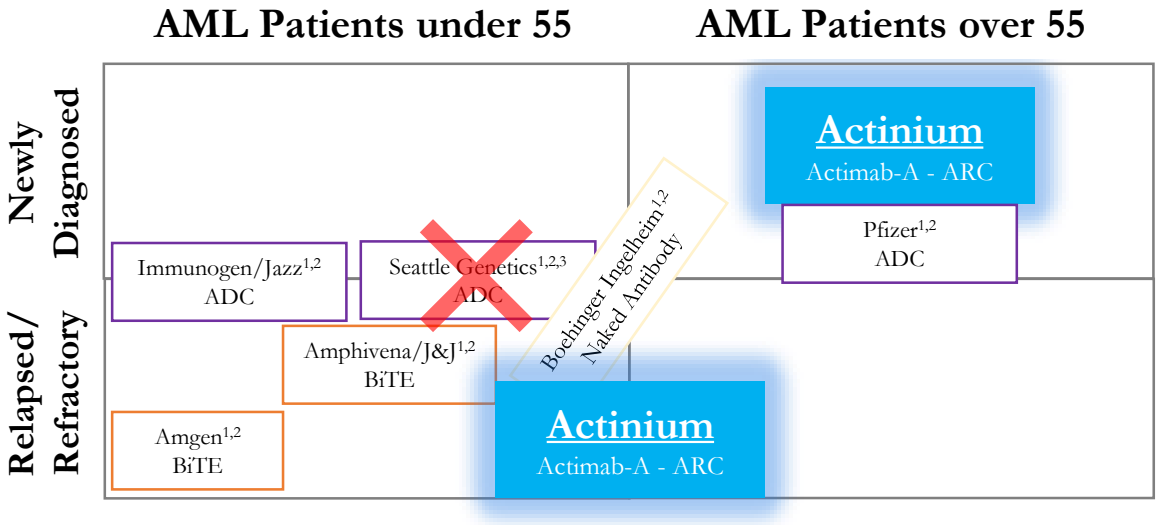
Pivotal Trial

- Consolidation therapy in MRD+ AML

V. Outlook for CD33 Program and Summary

Actinium's Industry Leading CD33 Program

Industrywide CD33 Programs Primarily AML focused



Actinium's ARC approach enables program expansion into multiple diseases and with multi-indications that are unlikely be matched by other programs

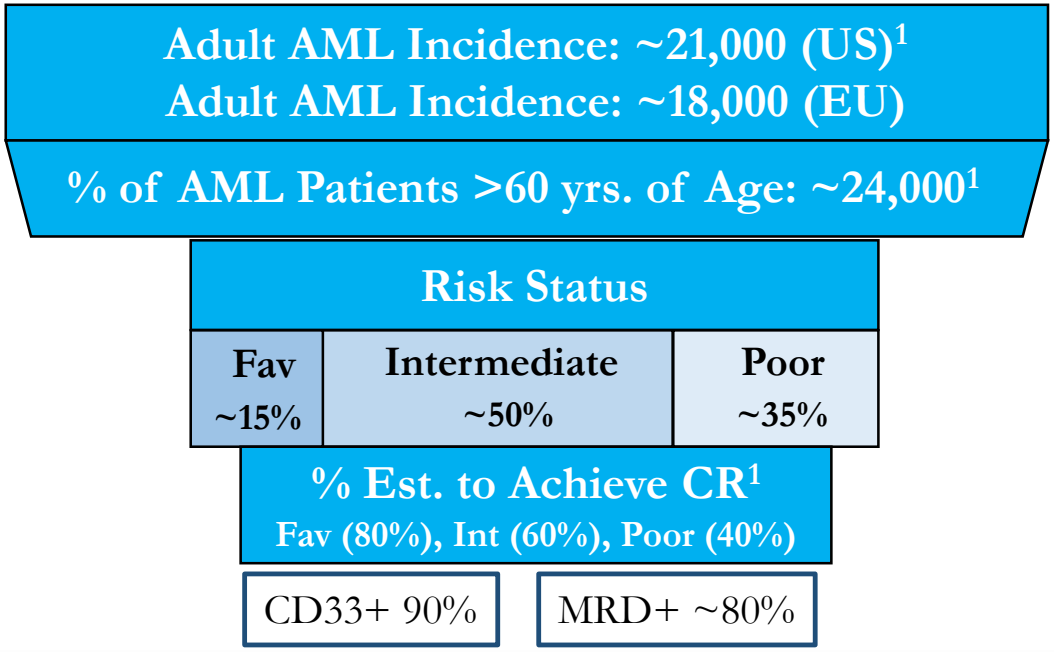
Actinium has the only unpartnered CD33 program

1. Clinicaltrials.gov 2. Company Materials 3. Conference Abstracts (ASH, AACR, ASCO) 4. Company estimates

Progressing and Expanding CD33 Program

	Therapeutics			BMT
Disease	Induction	Consolidation	Relapsed/Refractory	Targeted Conditioning
AML	Actimab-A	Actimab-A MRD	Actimab-A CLAG-M	Actimab-A CLAG-M
MDS				Actimab-MDS
Multiple Myeloma			Actimab-M (penta refractory)	

Attractive Consolidation Market Opportunity



Future expansion opportunities include patient population <60 yrs. of age

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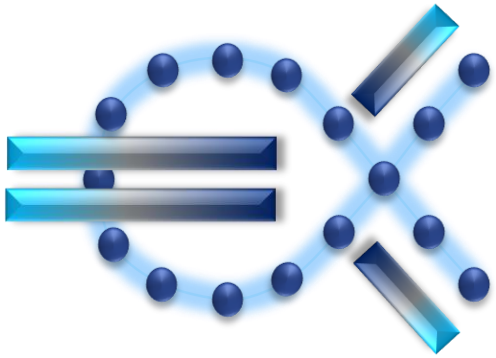
1) 2018 Kantar Health, SEER and Company Estimates
2) Estimated Consolidation Candidates: Fav (~90%), Int (~75%), Poor (~50%)

Conclusion

- AML remains extremely challenging and MRD+ patients have high relapse rates and suboptimal outcomes
- Poor survival outcomes demonstrate need for new therapies and mechanism of action
- Actimab-A's differentiated mechanism of action is agnostic to AML's molecular heterogeneity and is well suited to address the high unmet medical need in this indication
- Actimab-A MRD trial adds another potential attractive market opportunity to Actinium's CD33 program with a potentially straightforward pathway to a pivotal trial
- Actinium's ARC approach continues to enable expansion of our CD33 program into multi-indications, multi-diseases that will unlikely be matched by other CD33 programs

Thank-You



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