RubiusTherapeutics

REALIZING THE POWER OF RED™
A NEW ERA IN CELLULAR MEDICINE

FEBRUARY 2021

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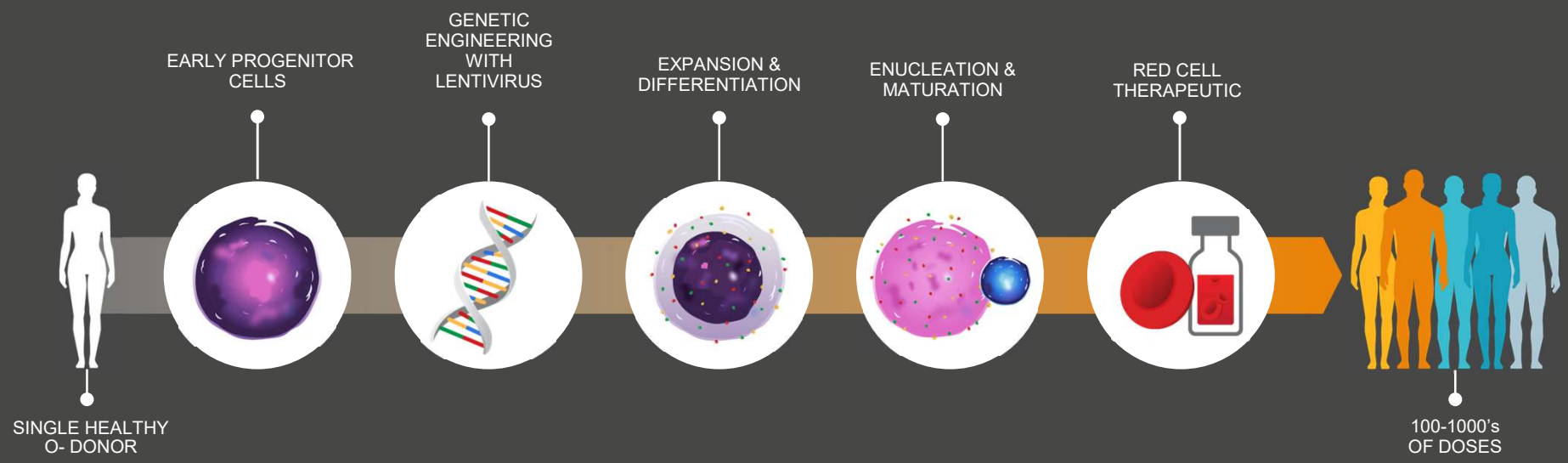
Strong Execution of Key Priorities

DELIVERING ON
CRITICAL MILESTONES AND BUILDING THE RIGHT CULTURE

- **Completed dosing of 5 cohorts** (n=14) in Phase 1/2 RTX-240 solid tumor clinical trial; generating clinical data
- **Dosing patients** in Phase 1 arm of RTX-240 clinical trial in relapsed/refractory acute myeloid leukemia (AML)
- **Screening patients** in Phase 1 trial of RTX-321 for HPV 16+ cancers; **frozen drug substance** with potential shelf life of up to several years
- Fully owned manufacturing enables execution of clinical trials; **conducting cGMP runs** for RTX-240 and RTX-321 clinical trials
- **Presented preclinical oncology data** supporting lead oncology programs at SITC, FOCIS, AACR & ASGCT

The Promise of the RED PLATFORM®



FEATURES

- Consistent research and manufacturing process
- Only modification is lentivirus to create new product
- Universal, scalable, reproducible

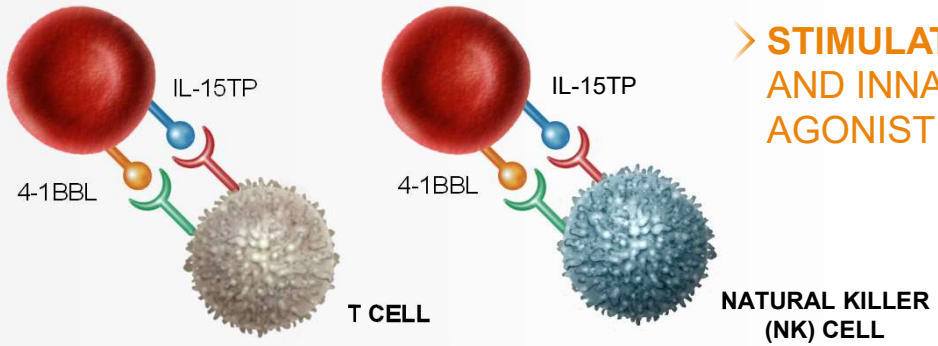
BENEFITS

- Leverages common CMC, toxicology data packages
- Shorter timeline to lead candidate
- Efficient cost structure

RTX-240: Enrolling Phase 1/2 Clinical Trial in Advanced Solid Tumors & Phase 1 Arm in Relapsed/Refractory AML

BROAD IMMUNE SYSTEM STIMULATION

RTX*-240 | (4-1BBL + IL-15TP)



STIMULATE ADAPTIVE AND INNATE IMMUNE CELL AGONIST PATHWAYS

POTENTIAL BENEFITS:

- Activate existing agonist pathways leading to enhanced potency
- Improve anti-tumor activity
- Overcome resistance to immunotherapy
- Reduce toxicity given biodistribution confined to vasculature

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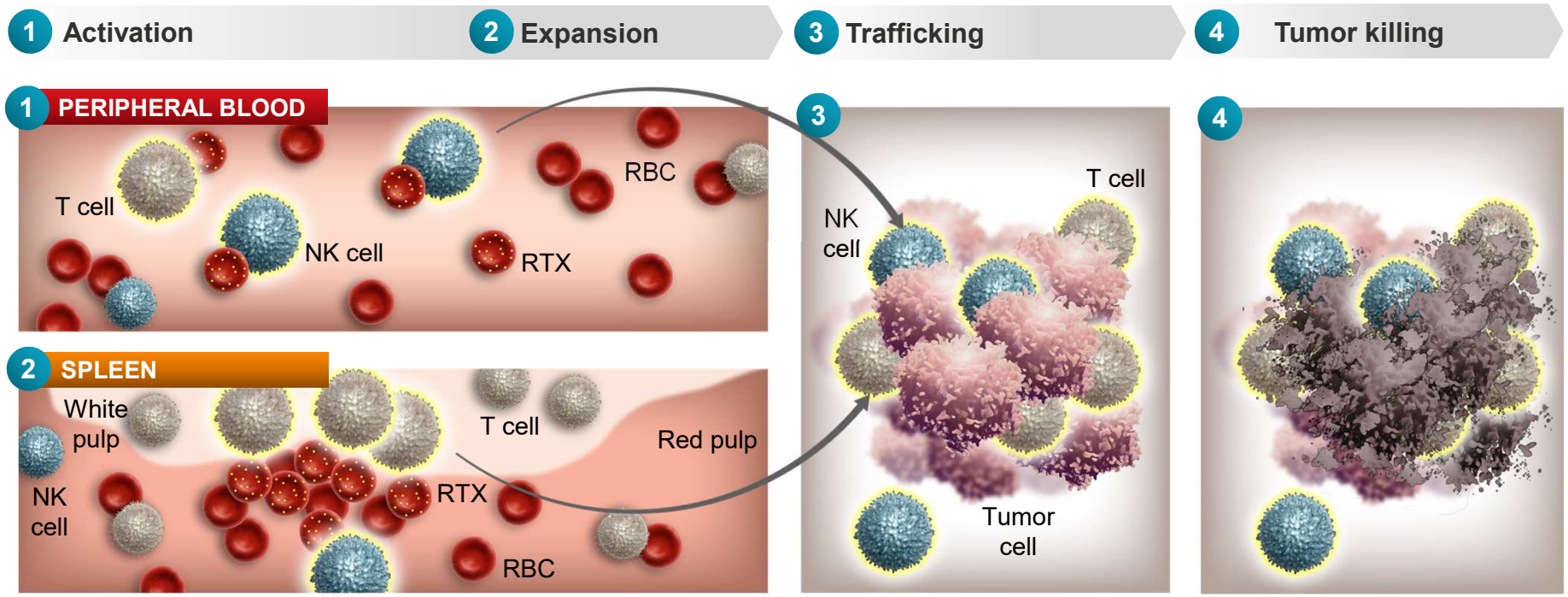
*Rubius Therapeutics Terminology: RTX – Red Cell Therapeutic product candidate; mRBC – mouse surrogate model; RCT – experimental construct

Proposed Mechanism of RTX-240



Potential for enhanced efficacy and safety by confining RTX-240 to the vasculature

RTX-240 Solid Tumor Clinical Development Plan

RTX-240

RELAPSED/ REFRACTORY (R/R) OR LOCALLY ADVANCED SOLID TUMORS

DEVELOPMENT PLAN

ENROLLING: Phase 1 Dose Escalation
5 Dose Cohorts Completed to Date (n=14)

- 1e8 (n=2) Q4W
- 1e9 (n=3) Q6W
- 3e9 (n=3) Q4W
- 1e10 (n=3) Q4W
- Further explore dose & interval
- 1e10 (n=3) Q4W*

Phase 2: Tumor-Specific Expansion Cohort #1

Phase 2: Tumor-Specific Expansion Cohort #2

ELIGIBILITY CRITERIA

- R/R or locally advanced, unresectable solid tumor for which no standard therapy exists, or for which the patient is ineligible or has declined standard therapy
- Median of 3.5 prior lines of therapy (range, 1-10)
- 10 of 14 patients had prior PD-1/PD-L1 inhibitor therapy

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*Exploratory alternate route of administration

Key Takeaways from Initial Data – RTX-240 Stimulates Adaptive and Innate Immunity, Supporting Proof of Mechanism

No treatment-related Grade 3-4 adverse events and no dose-limiting toxicities observed to date (n=14)

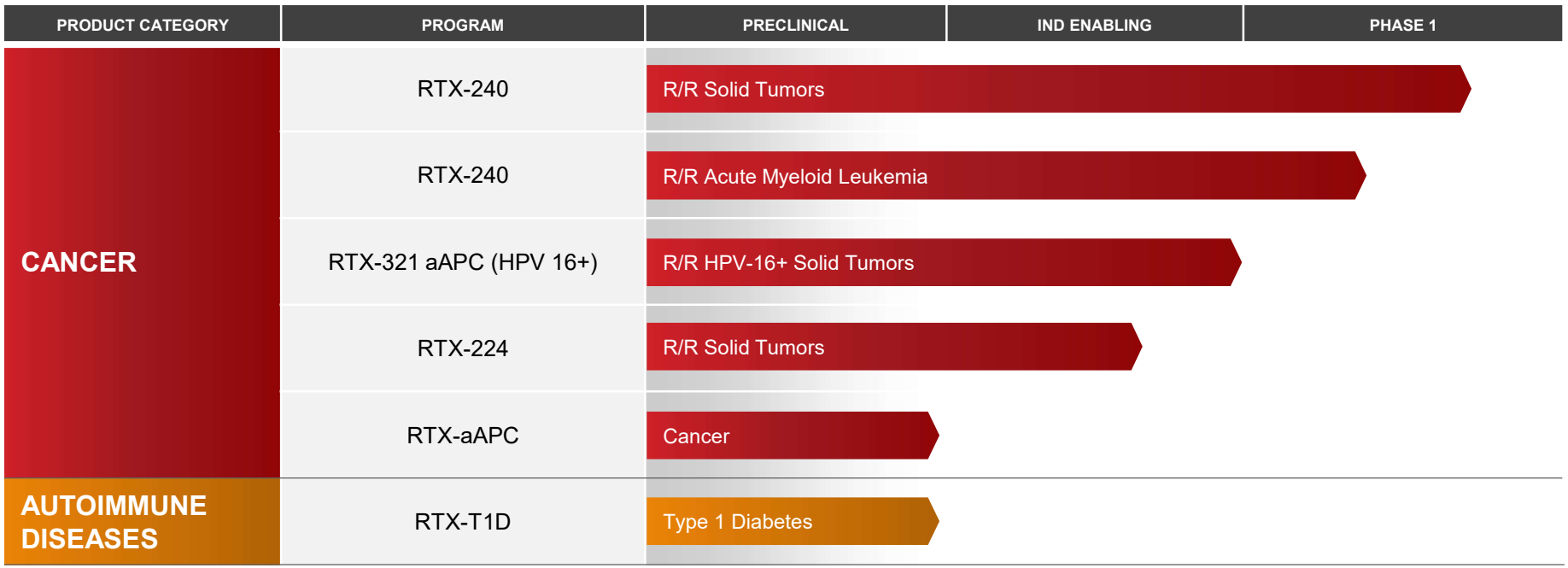
All patients showed activation of NK or T cells or both cell types (n=14)

In the majority of patients (n=8), all of the following were observed across dose levels:

- Activation of NK cells
- Activation of T cells
- Expansion of NK cells
- Expansion of T cells

Additional clinical data to be presented in early 2021, and submitted to a scientific conference

Clinical-Stage Company Building a Broad Wholly Owned Pipeline



Anticipated Upcoming Catalysts and Operational Objectives

- **Present additional clinical data** for RTX-240 solid tumor trial in early 2021, and submit to a scientific conference
- **Continue to enroll patients** in RTX-240 AML clinical trial
- **Dose first patient** in RTX-321 clinical trial in HPV 16+ cancers
- **Continue to produce** cGMP material for RTX-240 and RTX-321 trials from Rubius site
- **Present an integrated clinical program** for RTX-240, including plans for expansion cohorts, and oncology pipeline

Unlocking the potential of the RED PLATFORM in cancer and autoimmune disease

Cash runway into 2022