Corporate Presentation

MARCH 2019

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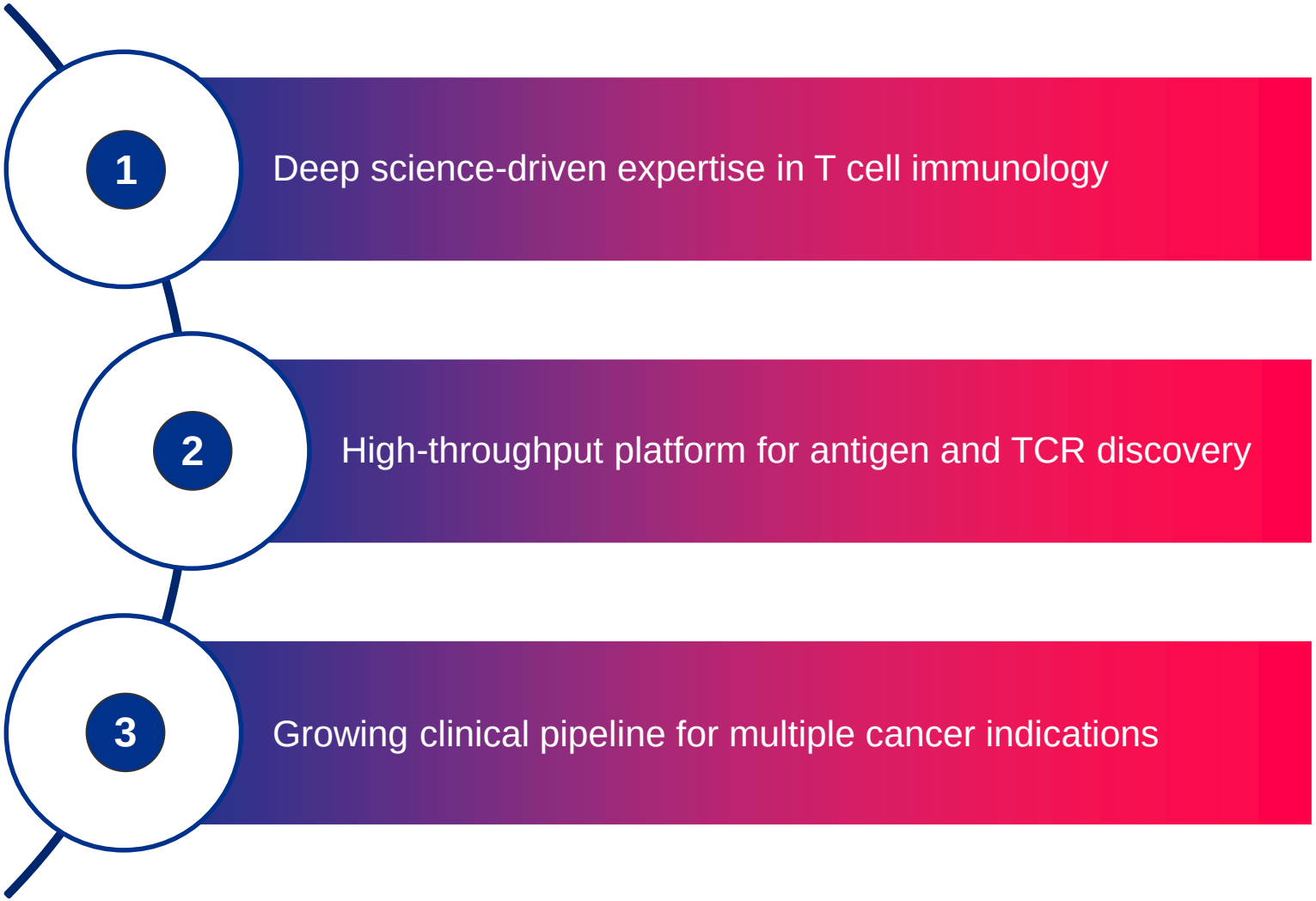
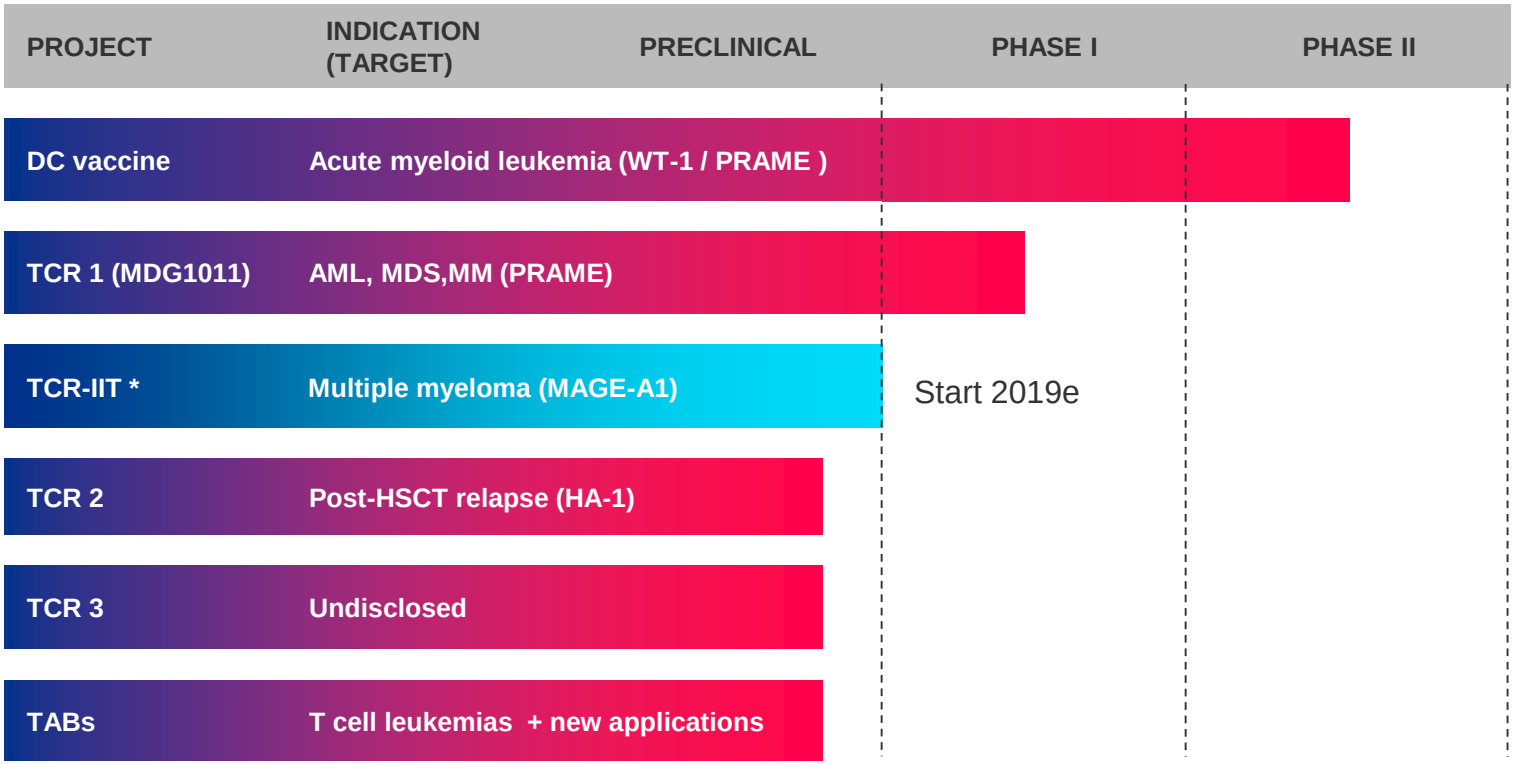
Medigene at a glance



Medigene's immunotherapy pipeline is growing



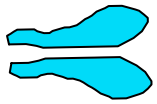
Additional IITs utilizing Medigene's DC vaccine technology are ongoing at LMU Munich (Phase I/II in AML) and Oslo University Hospital (Phase II in prostate cancer)

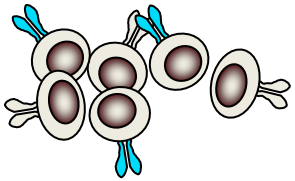
* Investigator-initiated trial (IIT) under the responsibility of Max Delbrück Center and Charité, Berlin

Medigene's TCR-T immunotherapies replace CARs with natural TCRs to target tumor cells

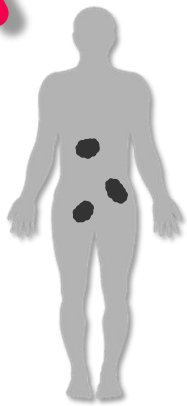
TCRs are receptors that recognize HLA-restricted target peptides on tumor cells

T cell receptors (TCRs)





T cells from patient

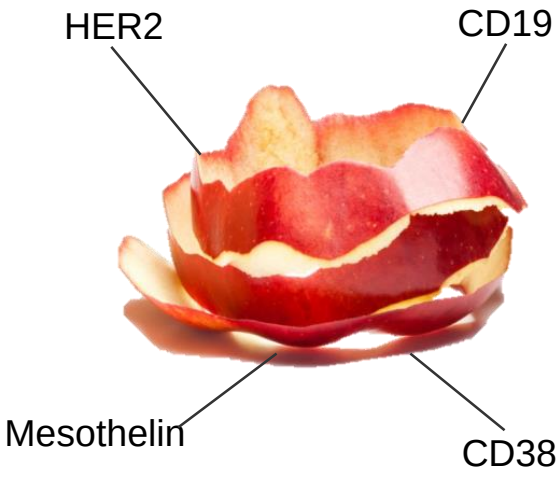


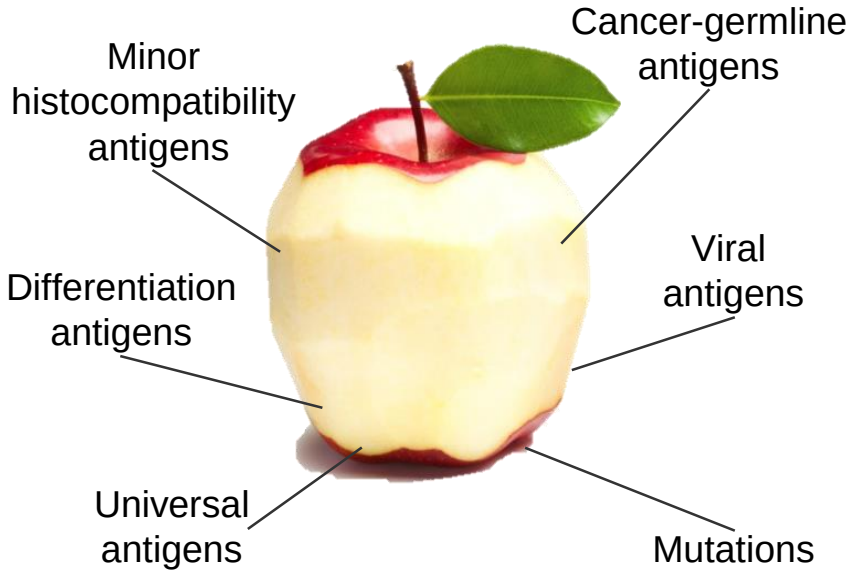
Patient

Introduce recombinant TCRs into T cells of HLA-matched patient and return TCR-modified T cell product (TCR-Ts) to the patient

T cell product

Medigene's TCRs target a broader spectrum of tumor antigens compared to CARs





CARs target only surface proteins:

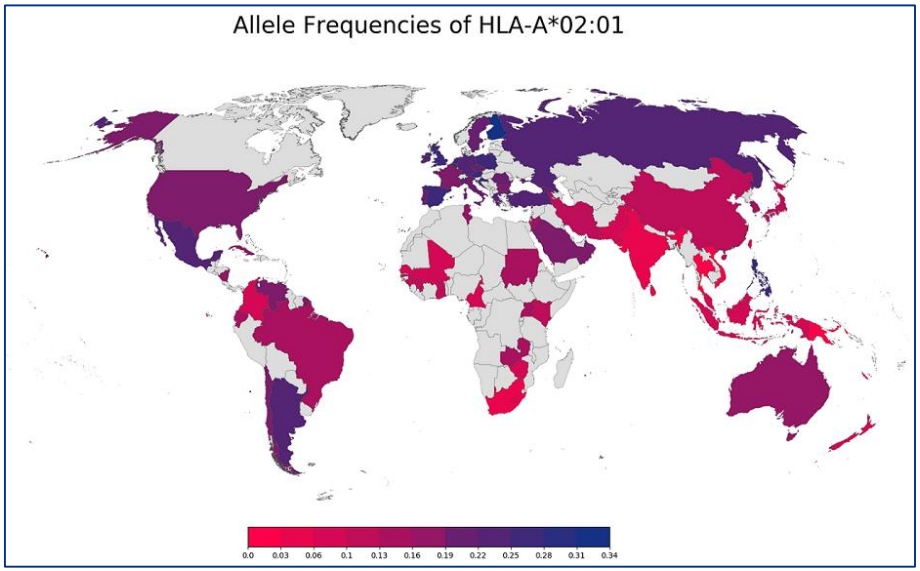
- App. 30% of human proteome
- Limited to cell surface antigens, only tens of options
- Recognition is Major Histocompatibility Complex (MHC)-independent
- Potentially higher risks of side effects

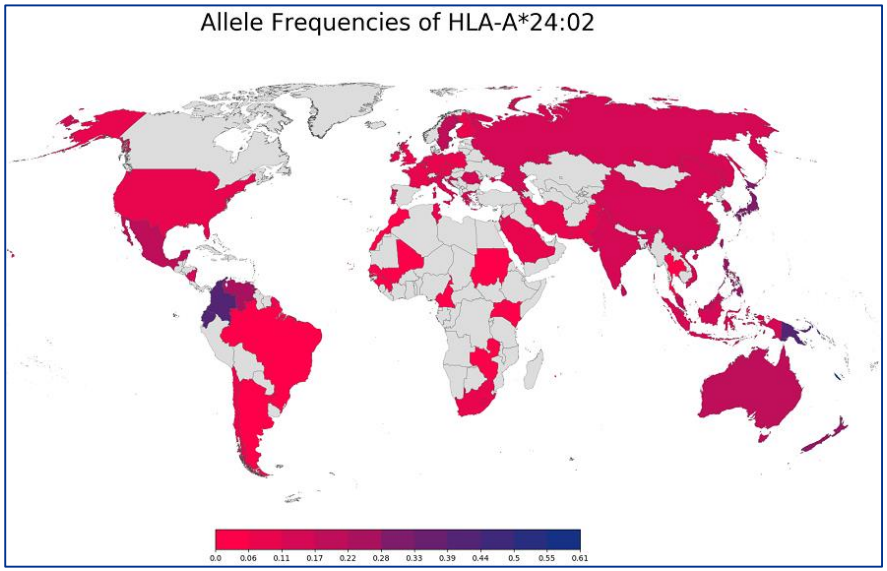
TCRs target also intracellular proteins:

- App. 70% of human proteome
- Recognize intracellular targets, with many thousands of options (more addressable targets)
- Recognition is MHC-dependent (adds specificity)
- Lower risk for side effects if TCRs are natural, non-mutated structures expected

→ **TCRs offer more options, more power, more sensitivity and more control**

Medigene has the ability to generate TCRs against multiple HLAs



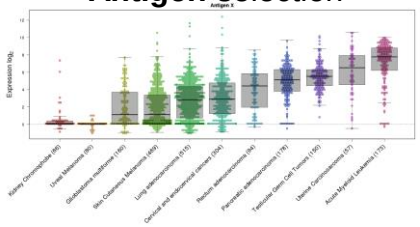


- TCRs with different HLA restrictions are necessary to cover patients in a certain geography
- Approximately 2-5 HLA types are required to cover >90% of a population in a given geography

HLA allele frequency data from www.allelefrequencies.net; Population sizes: Germany (69K), USD (2,9M) China (7K) Japan (20K).

TCR discovery process uses healthy donors

Antigen selection



Healthy donors

GM-CSF + IL-4

Monocytes

Lymphocytes

Cancer antigen (**ivt-RNA**)

Proprietary maturation cocktail

Mature DCs

Priming of T cells with mature DCs

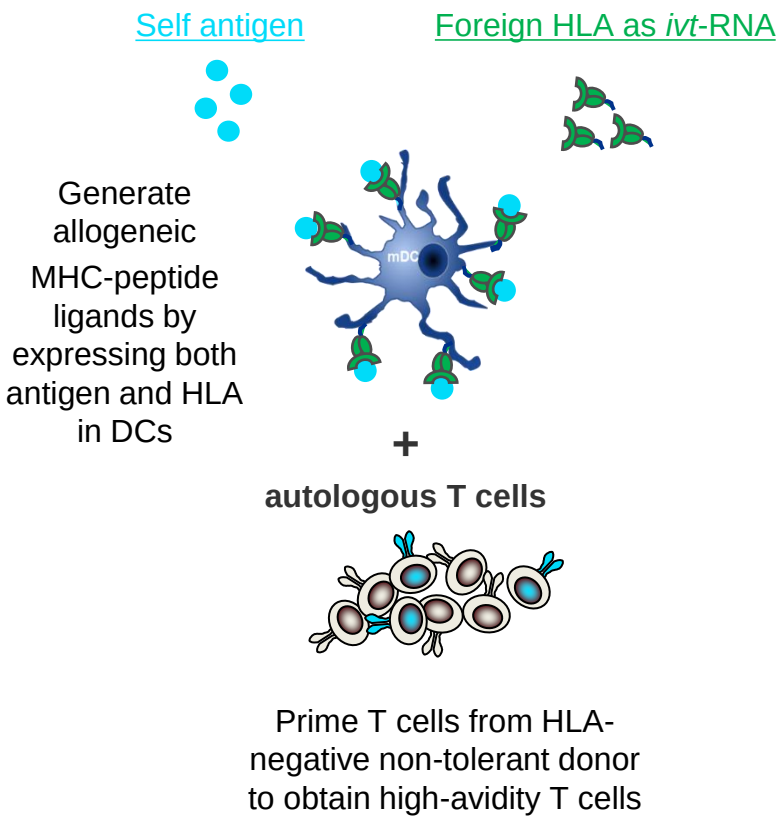
Enriched T cell repertoire

Isolation of antigen specific T cell clones

Sequencing and full **characterization** of TCRs

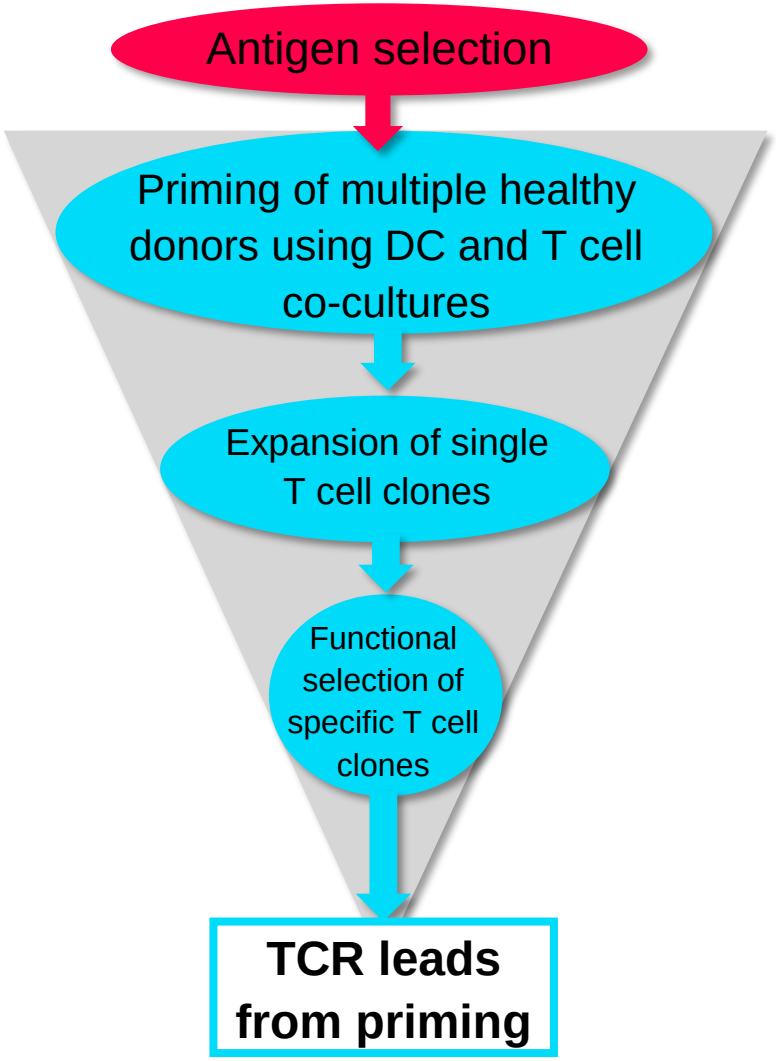
Vector encoding selected TCR sequence (SIN-virus)

High versatility in methods to obtain TCRs for different HLA-antigen combinations



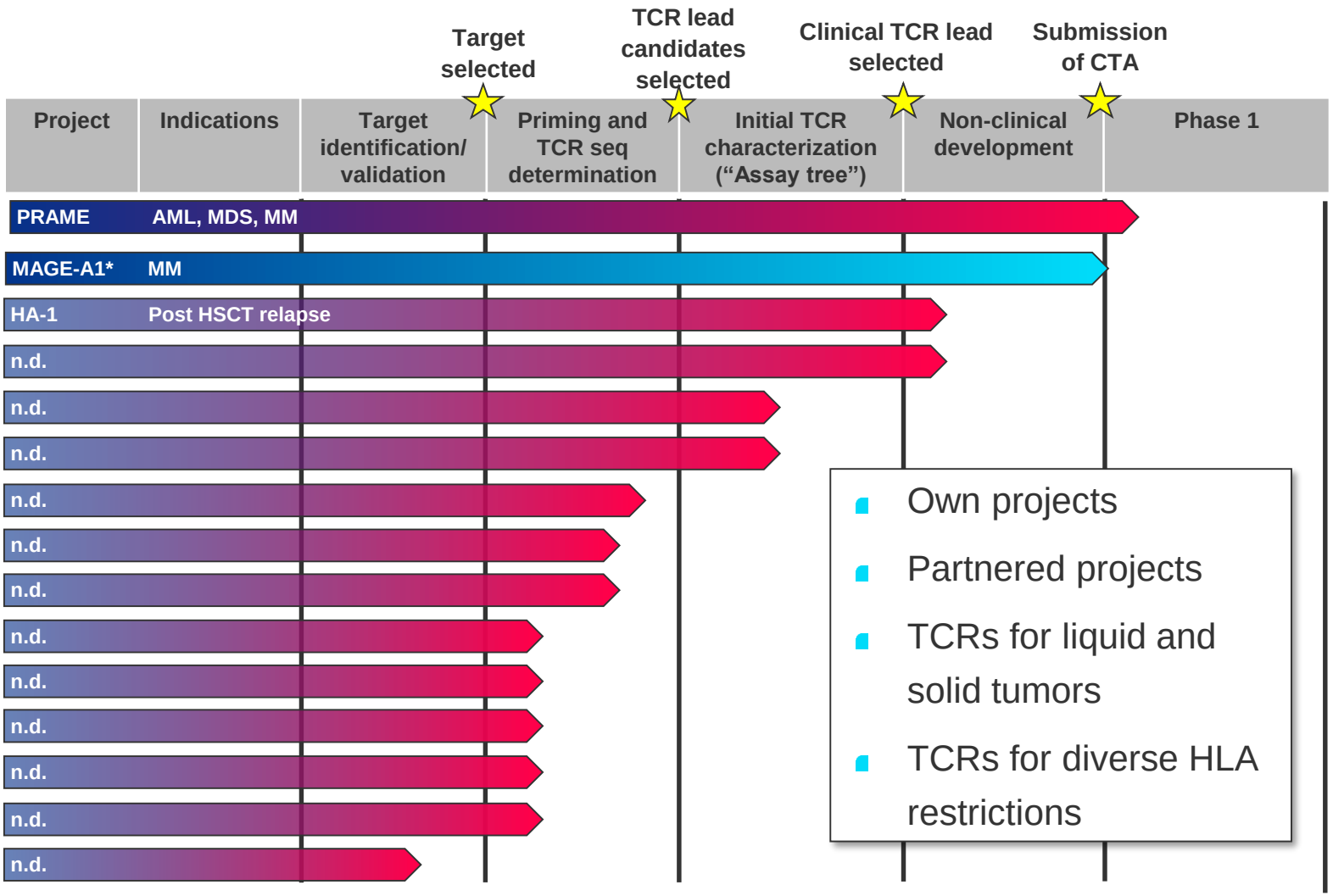
- Optimal priming capacity of mDCs is used for T cell priming *in vitro*
- Healthy donors provide autologous blood samples for DCs and T cells
- Any allogeneic class I or class II MHC can be used for peptide presentation
- Any antigen-encoding cDNA can be used to make ivt-RNA for DC loading
- A non-tolerant T cell repertoire can be tapped to obtain high-avidity T cell clones
- TCRs have natural higher-affinities without need for affinity maturation

Rapid and efficient TCR lead candidate identification uses high-throughput automation



- Highest level of standardization and reproducibility
- Exemplified by output over 12 month timeframe:
  - 145.000 wells automatically screened
  - 50.000 screened clones
  - 3.500 characterized specific T cell clones

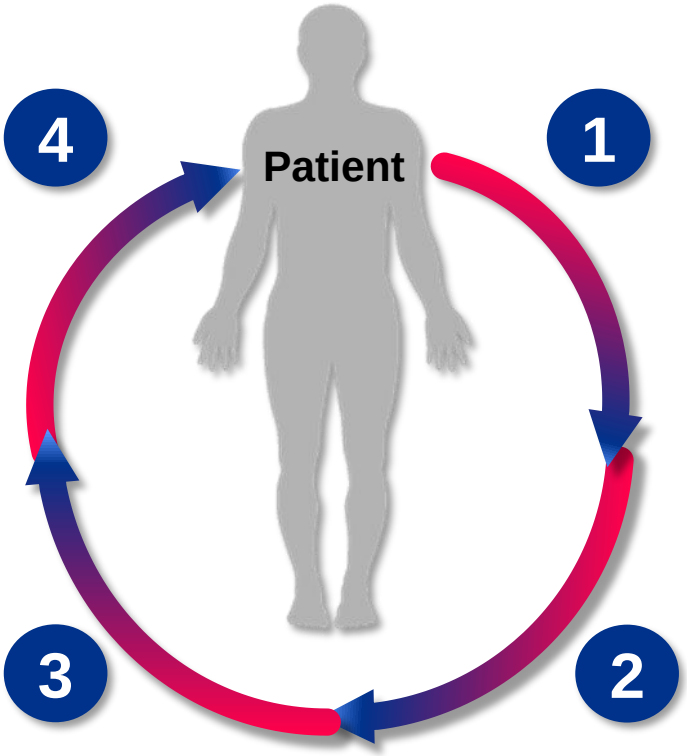
Medigene's growing TCR research pipeline demonstrates the power of our platform



* Investigator-initiated trial (IIT) of a publicly funded collaboration between MDC, Charité and Medigene

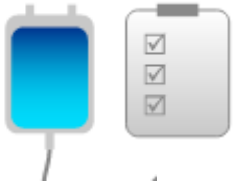
Personalized cancer treatment with TCRs in four steps

Thawing and re-infusion into patient

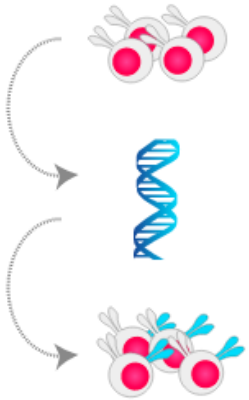


Leukapheresis & T cell isolation

TCR-T cell product

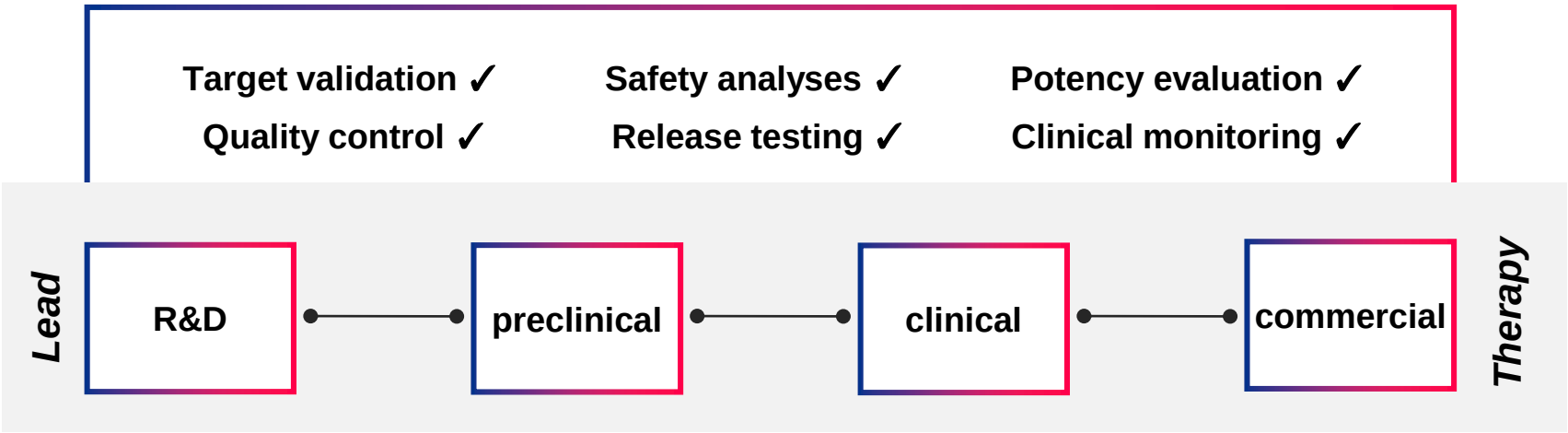


GMP: expansion, freezing and quality tests



GMP: activation of T cells and transfer of TCR from TCR pipeline

Immune monitoring facility supports lead discovery through clinical trial monitoring



- Assay development
- Assay validation
- Assay training
- Inter-laboratory controls

- Multi-color ELISPOT
- Cytokine assays
- Cytotoxicity assays
- Self-peptide analysis
- Alanine scan
- Expitope® (*in silico*)
- Nanostring® methods
- Statistical data evaluation

- GCP/GCLP-compliant immune monitoring
- FACS sorting
- Multi-color flow cytometry
- Cytokine secretion assay

- Data evaluation
- Documentation
- Validated IT Environment

Steady progress in science-driven innovation

Cutting-edge technologies assessed to **improve selection and functional properties** of T cell immunotherapies:

- Enhancement of T cell effector function *in situ* (Cancer Research 77:3577, 2017). In-license of PD-1:41BB fusion costimulatory protein to turn negative signal into positive amplification of effector cells.
- Application of robotic technologies for functional identification of immunogenic neoantigens

Innovative approaches to **improve safety** of next generation T cell therapies under evaluation and development:

- Tagging of TCRs for tracking and elimination
- Inducible TCRs
- 3D cell culture systems for high-end safety and pre-clinical efficacy analyses

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MDG1011

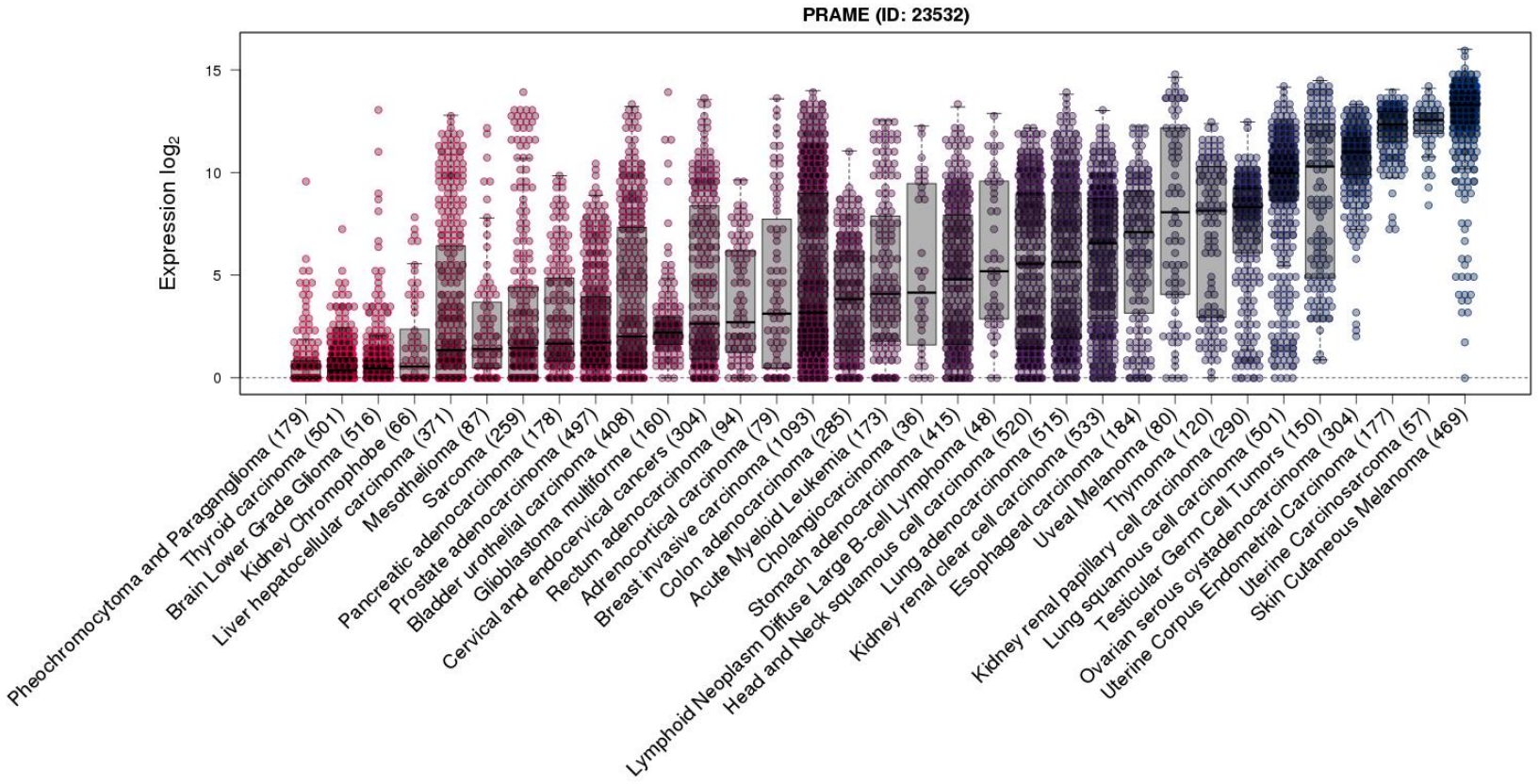
First TCR therapy clinical trial

PRAME is the target of Medigene's 1st lead TCR

- PRAME (Preferentially Expressed Antigen of Melanoma) is a well described cancer-testis (CT) antigen
- Literature reports (in addition to in-house data) that PRAME expression is high in tumors but very scarce or absent in normal tissues
- Medigene's clinical trials indicate that using a PRAME DC vaccine is safe and well tolerated, confirming other vaccine trials targeting PRAME
- PRAME mRNA is expressed in 9 out of 10 common non-hematological cancers (NCI):
  - bladder, breast, colorectal, kidney, liver, lung (NSCLC & SCLC), prostate, thyroid and uterus

PRAME RNA expression is prevalent in a broad spectrum of tumors

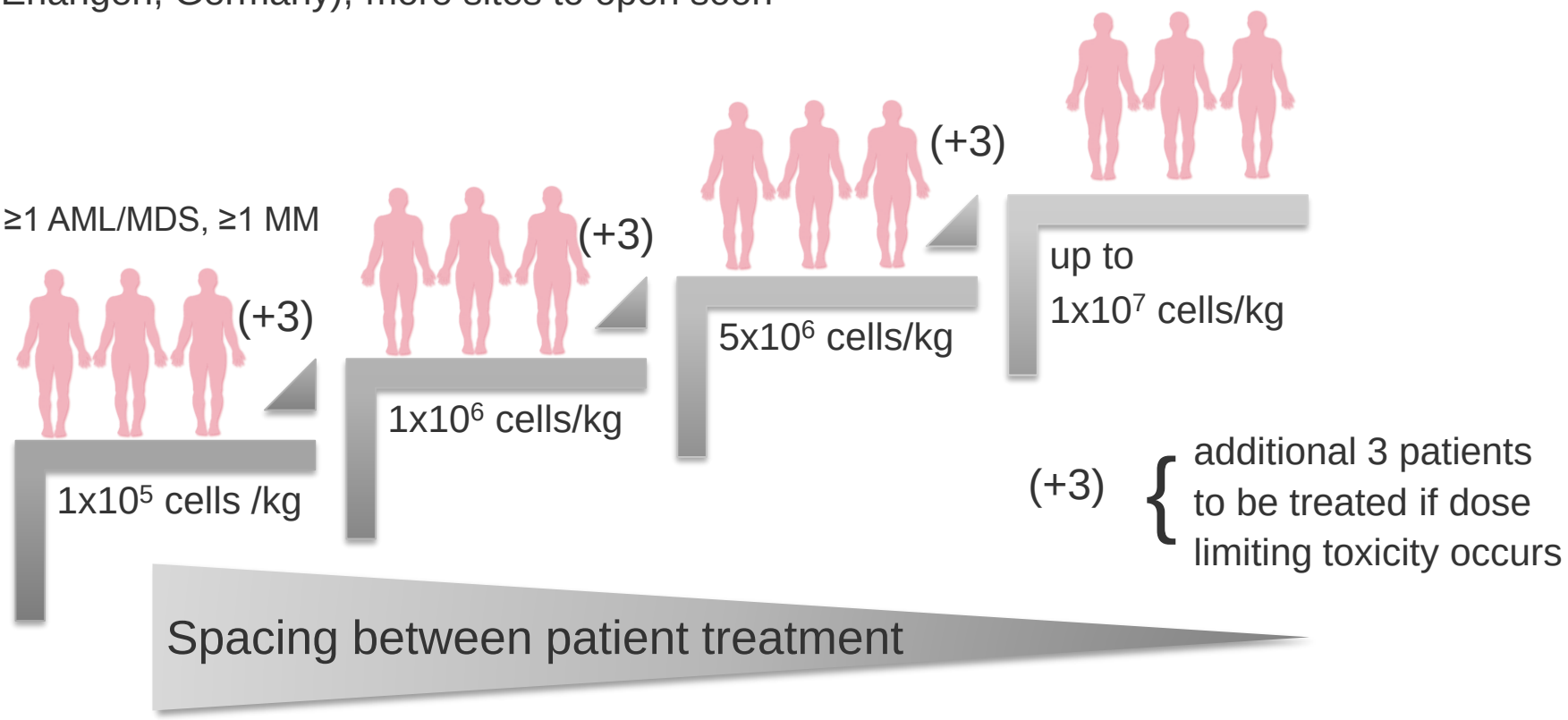
- Tumor expression patterns with each circle representing an individual patient:



Scale is given as RSEM. RSEM quantifies gene and isoform abundances from single-end or paired-end RNA-Seq data.

First patient treated in Phase I in February 2019

Multi-center study with approx. 12 patients at currently three sites (University of Regensburg, Würzburg and Erlangen, Germany), more sites to open soon

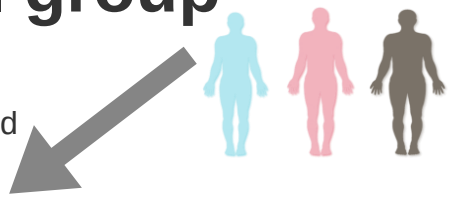


= independent Data and Safety Monitoring Board (DSMB) decides on progression between dose cohorts.

https://www.clinicaltrialsregister.eu/ctr-search/trial/2017-000440-18/DE

MDG1011 clinical trial design for Phase II includes control group

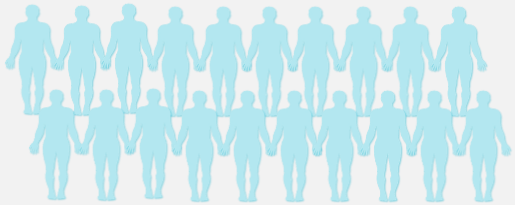
Estimate that 2 of 3 indications will be carried into Phase II (after a DSMB and PEI/ethics committee vote)



Screened patients

PRAME positive
HLA-A*02:01 postive

PRAME positive
HLA-A*02:01 negative
(genetically not suitable for MDG1011)



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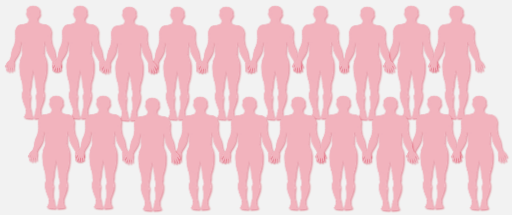
MDG1011 treatment



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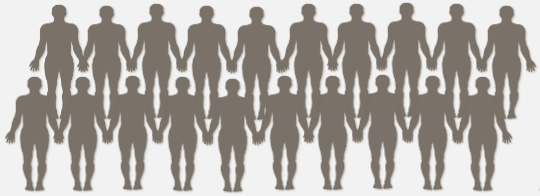
Indication 1

Indication 2



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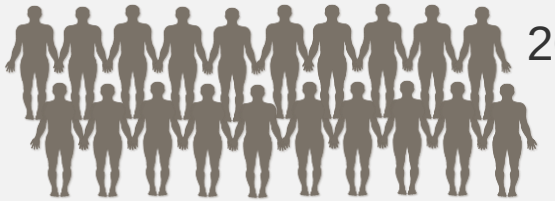
Investigator‘s choice treatment



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Treatment group

Control group

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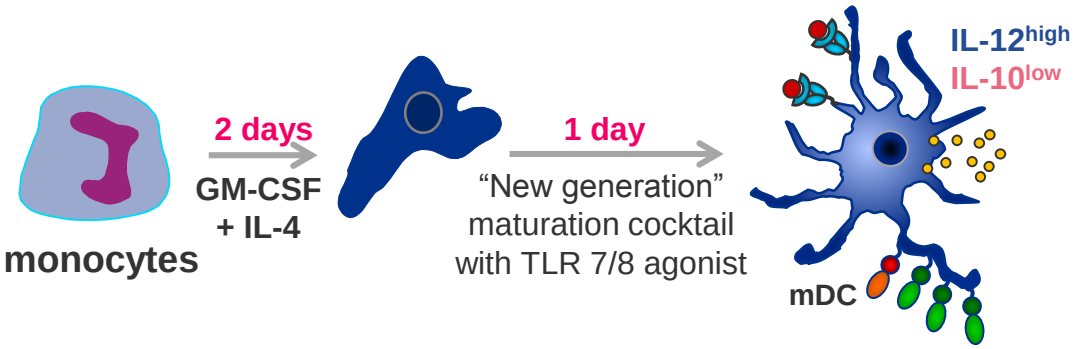
DC vaccine trial in AML

Medigene's approach to DCs vaccines



New generation "polarized" 3d-mDCs

Optimized interleukin (IL) secretion pattern for innate and adaptive immunity

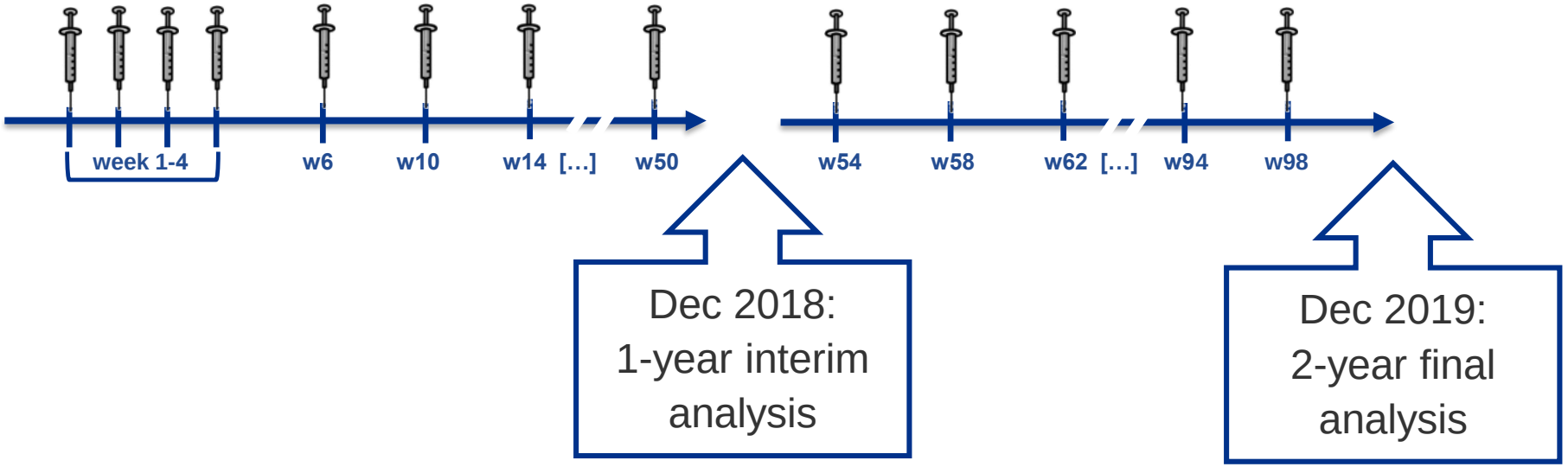
Best biological properties for improved clinical efficacy

- **Defined antigen loading with *ivt*-RNA** replaces unknowns of loading with peptides or tumor lysates
- Use of full length antigen requires **no need for patient HLA selection**
- **Positive co-stimulatory profile is optimal** with young 3-day mature dendritic cells
- **Optimal cytokine polarization supports** both innate and adaptive immune responses
- **High quantity yields of DCs** allow for **20+ vaccinations** (>85% mature polarized DCs)

Best product characteristics for commercialization

- 3-day production is **cost effective** and **amenable to automation**
- **RNA** as source of antigens is **versatile, inexpensive** and has **no need for tumour material**
- **Single-batch production** reduces time, costs and is patient friendly (only one apheresis)
- **Frozen vaccine formulation** gives **2+ years of shelf-life** and simplified logistics

Treatment scheme of Medigene's DC trial embodies extensive vaccination over a 2-year time period



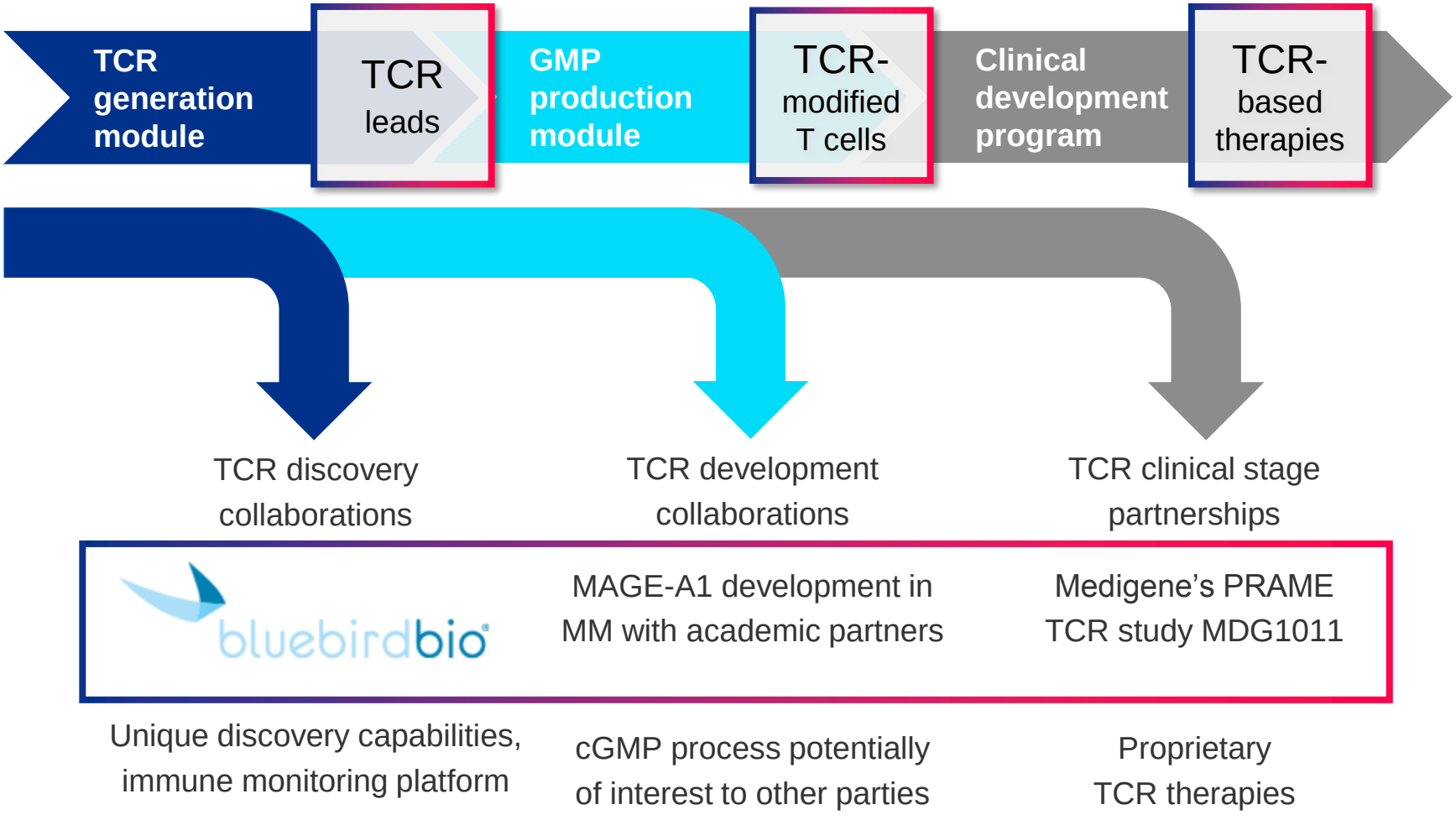
- Open-label, prospective, non-randomized trial with 20 AML patients
- Primary objectives: feasibility and safety
- Secondary objectives: overall survival (OS), progression free survival (PFS), control of minimal residual disease (MRD), time to progression (TTP), induction of immune responses

Topline data from first half of treatment period (one year) in Phase I/II study

- **Very good feasibility for manufacture** of vaccines from patient-derived monocytes
- **Excellent safety and tolerability profile**
- **Preliminary data** on overall survival and progression-free survival:
  - 20 subjects (median age 59, range 24 to 73) in 3 AML risk groups:
    13 good, 5 intermediate, 2 poor
  - **Overall survival 89%** (18 of 20 patients, 95% confidence interval: 61 to 97%)
  - **Progression free survival 60%** (12 of 20 patients, 95% confidence interval: 36 to 78%)
  - Majority of relapses (5/8) and deaths (2/2 at 45 and 64 days) occurred within the first 80 days of treatment, possibly indicating start of relapse at study entry

Presentation of further details planned for an upcoming scientific conference

Value creation in TCR development



Expansion of strategic alliance with bluebird bio

- Number of T cell receptor (TCR) discovery projects increased from four to six
- **Deal structure:**
  - Upfront payment of USD 15 million in 2016 and additional payment of USD 8 million in 2018
  - Potential preclinical, clinical, regulatory and commercial milestone payments up to USD 1.5 billion
  - Royalties on net sales
- Joint preclinical development of all product candidates
- bluebird bio gains worldwide development and commercial rights and exclusive license for IP covering the TCRs
- Extension will significantly increase R&D funding and potential milestone payments to Medigene reflecting the extended scope of the collaboration

bluebirdbio

Expansion of TCR pipeline through licensing agreement with Leiden University

- Medigene licensed a Histocompatibility Antigen 1 (HA-1)-specific TCR from Leiden University
- HA-1 belongs to the group of minor Histocompatibility Antigens (mHA)
- The Leiden University HA-1-specific TCR was already tested in a small IIT Phase I trial with five patients, showing safety and tolerability, making it a partially de-risked preclinical/clinical asset
- The TCR will be assessed internally at Medigene for its potential for clinical development in numerous liquid and solid tumors

HA-1: Unique opportunity to complement and advance TCR-T clinical development program

Antigen

- HA-1 extensively studied in-house
- Very well defined, easily assessed by PCR
- Well characterized tissue expression pattern
- Clinically validated T cell target in SCT

Patients

- High medical need
- Broad HA-1 expression in liquid & solid tumors
- Especially interesting in the stem cell transplantation setting; mismatched in 10-20% of cases
- Well defined indications for clinical use

TCR

- First safety & tolerability data from IIT in Leiden with five patients
- Clinically de-risked TCR

PD-1/4-1BB: In-licensed co-stimulator to enhance TCR therapies for solid tumors

- Medigene entered an exclusive license agreement with Helmholtz Zentrum Munich (HMGU) for a chimeric co-stimulatory receptor (fusion protein of PD-1 and 4-1BB)
- The PD-1/4-1BB molecule is designed to reverse the “stop” signal to a “go” command to help T cells overcome the checkpoint blockade in the tumor microenvironment
- To be explored in combination with Medigene’s TCR-Ts for the treatment of solid tumors
- Worldwide, exclusive license for the therapeutic and diagnostic use
- HMGU receives an upfront fee, an annual maintenance fee, milestone payments and royalties on marketed therapeutic and diagnostic products containing the chimeric co-stimulatory receptor.

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Corporate & financial highlights

New CFO/CBDO: Axel Malkomes

- Axel Malkomes starts on 1 April 2019 as Chief Financial Officer (CFO) and Chief Business Development Officer (CBDO)
- Mr. Malkomes will assume responsibility for Finance, Business Development, Public & Investor Relations, Legal Affairs, IT and Commercial Operations
- Mr. Malkomes has been active in the healthcare sector for more than 25 years:
  - Managing Director of the Life Sciences Practice at Barclays
  - Global Head of Healthcare & Chemicals Investment Banking at Société Générale
  - Co-head of European Healthcare Investments at 3i
  - Operational and corporate roles at the German pharmaceutical company Merck KGaA

Preliminary results for 2018 published

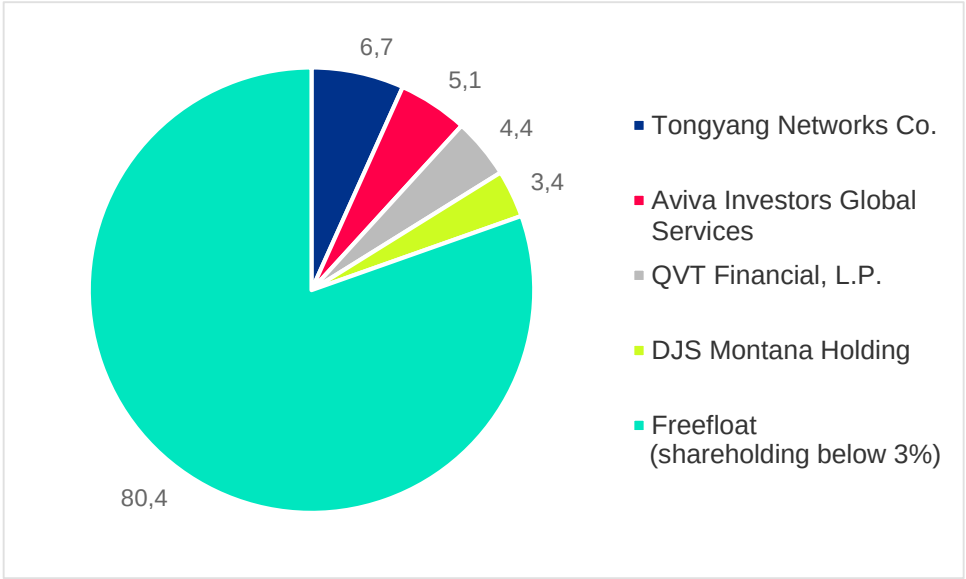
	2018
Total revenue	€7.8 m
R&D expenses	€17.1 m
EBITDA loss	€16.3 m
Cash usage	€10.3 m

- EBITDA guidance 2018 met
- Liquid assets as of December 31, 2018 amounted to €71.4 m
- Medigene expects it has sufficient financial resources at least for the planning horizon of two years
- No milestone payments or additional cash inflows are included from existing or future partnerships or transactions

Shareholder structure

Key share information

- Listed on Frankfurt Stock Exchange (Prime Standard)
  Symbol: MDG1
  ISIN: DE000A1X3W00
- Number of outstanding shares: 24.6 m
- Current market cap of approx. €215 m



March 2019, Numbers based on last voting right notifications

Outlook

MDG1011, Medigene's first TCR trial:

- Treatment of first dose cohorts

Medigene's DC trial in AML:

- Analysis of 1-year-treatment (half of treatment period) to be presented at scientific conferences in 2019
- Final read-out (2-years-treatment) expected end of 2019

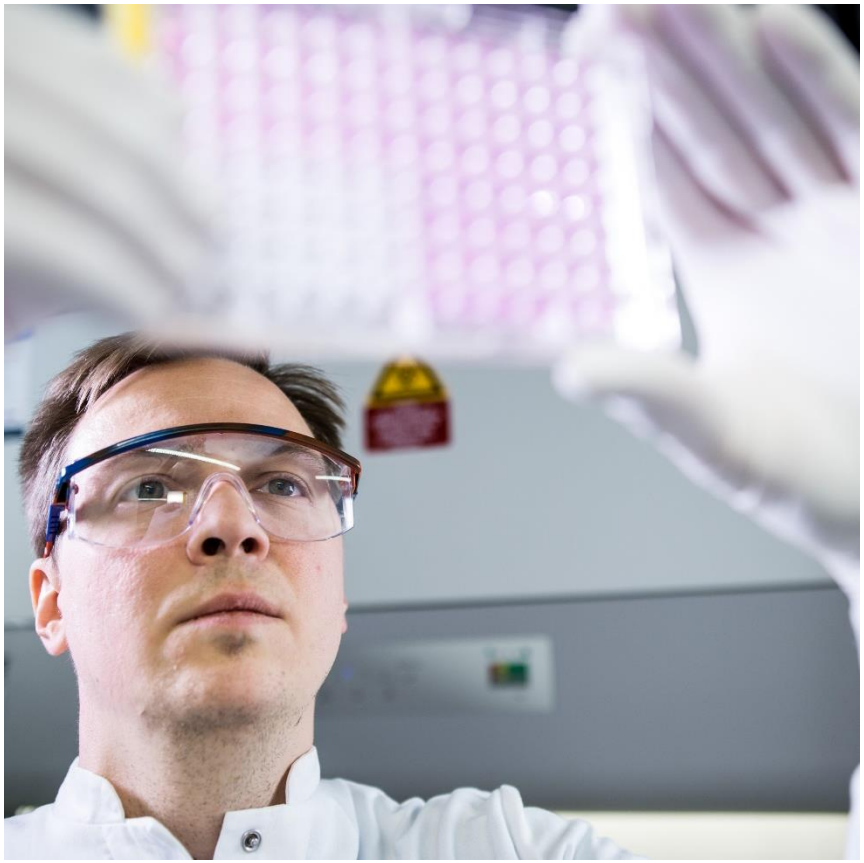
HA-1 TCR:

- Further preclinical evaluation

TCR IIT by MDC & Charité:

- Study start

Progress in expanded bluebird bio collaboration



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IR Calendar 2019

Annual Report 2018	27/03/2019
Q1 Report	14/05/2019
Half-year Report	07/08/2019
Q3 Report	13/11/2019

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