

# HEMA<sup>to</sup>O

AI-based Decision Support for Clinical Flow

# Blood cancer

*Blood cancer is a major burden on patients and society*

**Blood  
cancer**

**Leukemia**

**Lymphoma**

**Multiple myeloma**

**>1.2M**

yearly incidence  
(global)

**40k**

yearly incidence  
(Germany)

**60%**

mortality rate

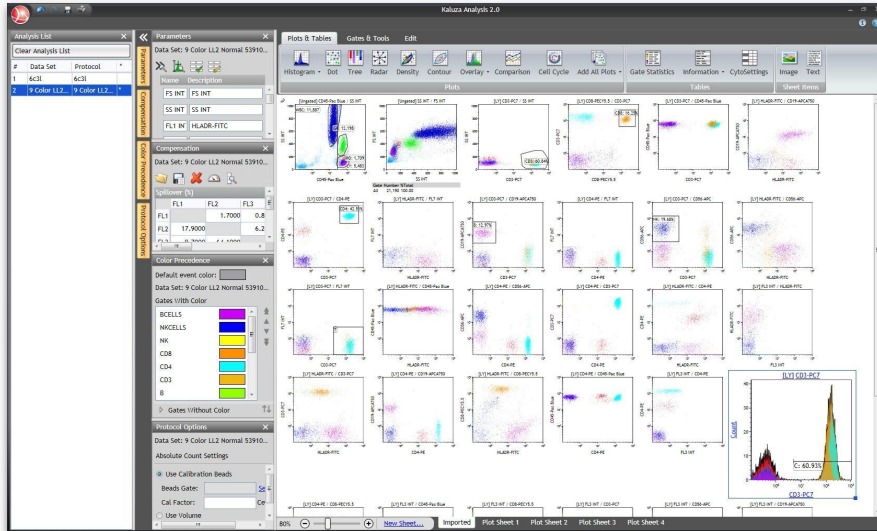
**50%**

increase since  
2000

# The Problem. Slow, costly, prone to error.

*Workflow hasn't fundamentally been updated*

Doctors look for abstract patterns by eye  
in **complex blood measurements**  
using **outdated software**



Slow (minutes-hours)



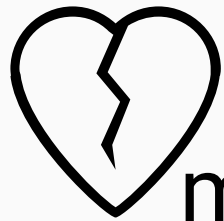
Expensive (€500)



Prone to error (~2.7%)

# The Problem. The cost of misdiagnosis.

*Patients experience the health cost. Insurers pays the financial cost.*



≈ 2.7%

**misdiagnosis rate**

Average of two expert opinions (1% and 5%) and 2.2%  
(due to lab tests in pediatric leukemia blood cancer).

## **False positive**

Result: traumatic, unnecessary treatment

## **False negative**

Result: delayed treatment

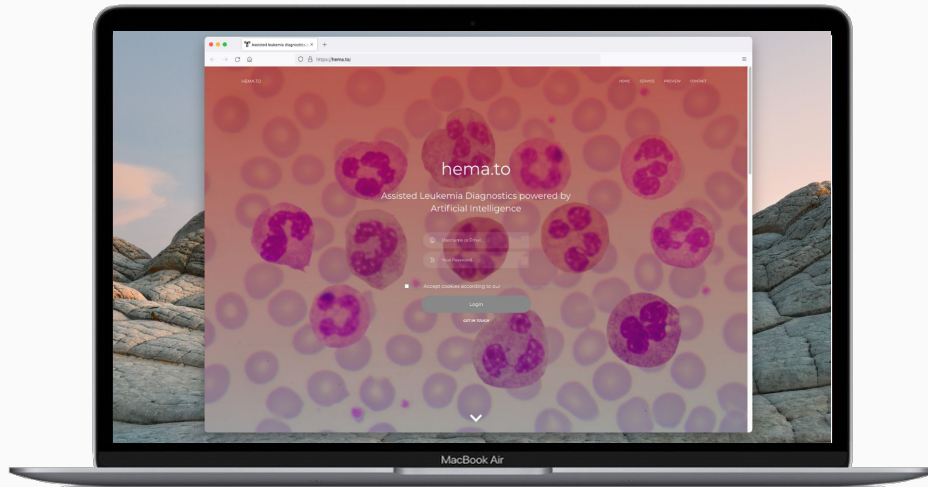
## **Wrong disease**

Result: suboptimal treatment

Insurers incur **€450 hidden cost** per  
sample from these misdiagnoses

# The Solution. Introducing hema.to

*Increase efficiency while maintaining quality*



**5x faster diagnosis**

Enable lab to satisfy increasing demand



**€100 cost reduction**

Increase lab's profits

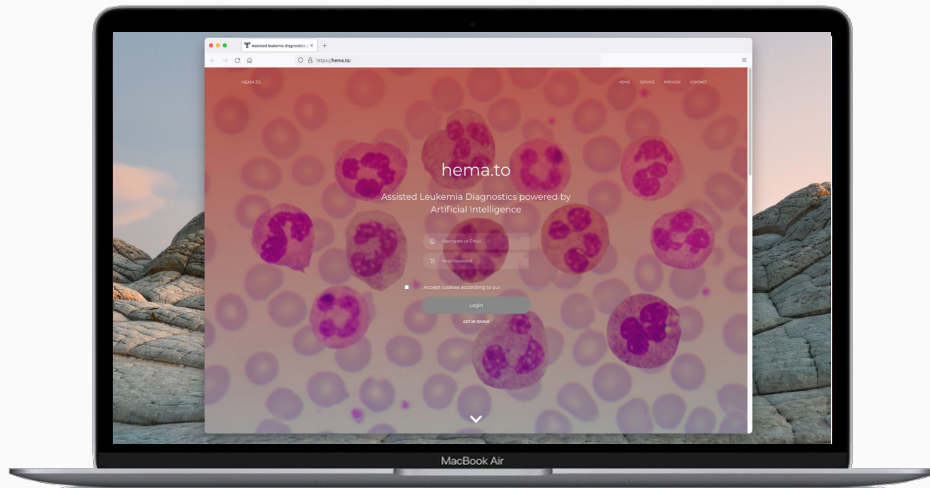


**2x reduction of errors**

Empower lab to improve quality

# The Solution. Introducing hema.to

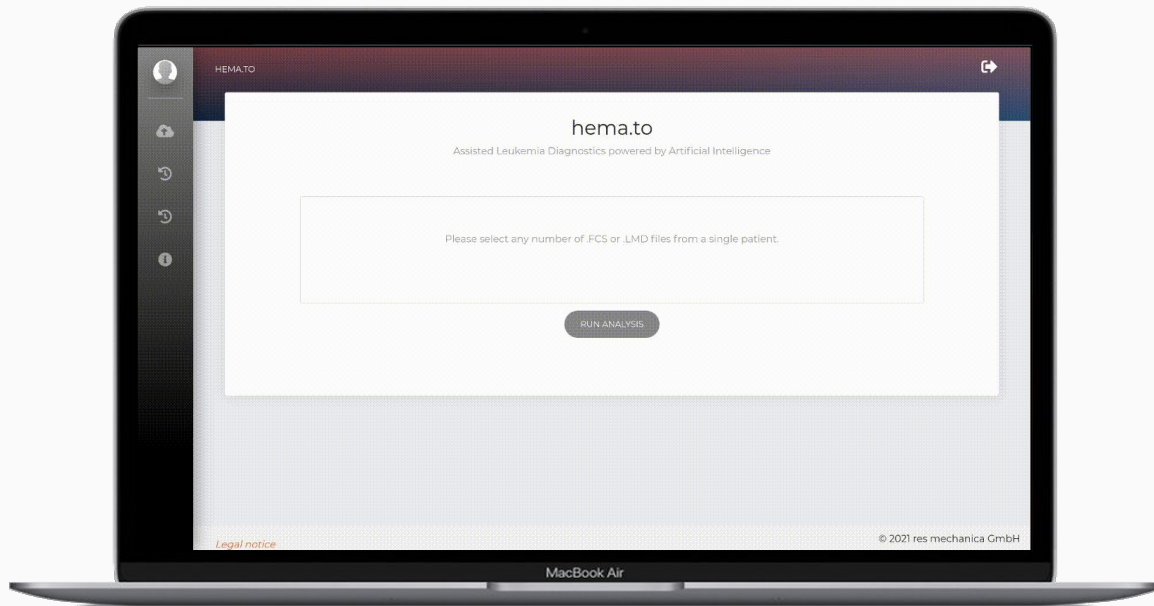
*Increase efficiency while maintaining quality*



Our mission:  
**10x reduction of  
misdiagnoses**

[hema.to](https://hema.to) is our proprietary web service based on state-of-the-art AI to diagnose leukemia...

*automatically,  
consistently,  
on expert level,  
& within seconds*



hema.to in action on patient with chronic lymphocytic leukemia (CLL)

# hema.to is a highly scalable SaaS in a global market



**globally standardized**  
file format



**zero integration costs**  
because hema.to is a web-app



**hardware agnostic**  
because labs use PC for diagnosis



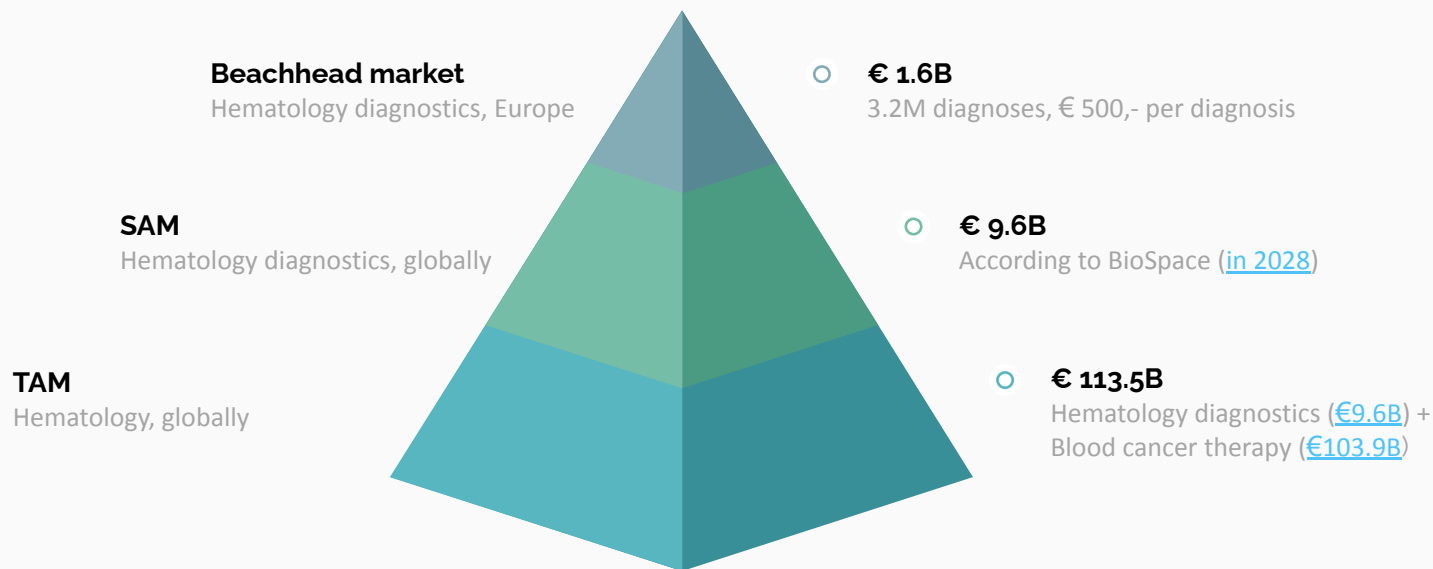
**B2B sales**  
to private labs with profit motive



**steady cash flows**  
from fixed demand for diagnoses



# Market size



## Adjacent spaces

### Immune therapy ([€86B market](#))

Flow cytometry is used for monitoring & guiding immune therapy, a [€86B](#) and rapidly growing market. Value proposition: automated routine monitoring.

### Next-generation sequencing (NGS, [€7B market](#))

NGS is used for diagnostics, prognosis and determining treatment of blood cancers, a [€7B market](#). Value proposition: integrate NGS with flow cytometry.

### Cytogenetics ([€2.6B market](#))

Collection of techniques used for diagnostics, prognosis and determining treatment of blood cancers, a [€2.6B market](#). Value proposition: integrate diagnostics for personalized diagnoses.



## Business model

**Customers:** private hematology & hospital labs

Demand:	×	SaaS fee:	=	Revenue:
<b>10k</b>		<b>€20,-</b>		<b>€200k</b>
diagnoses per customer		per diagnosis		per customer

## Scope

**Diagnostic scope**



**Geographical scope**



**Beachhead market**

Flow cytometry

Europe (~650 labs)

**Follow-up markets**

Other diagnostics (a.o. ICA), immune therapy

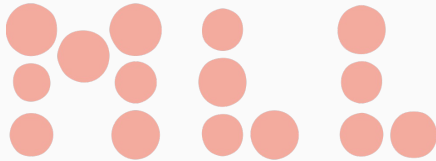
Global (~4k labs)

# Market Traction



Institut für  
Hämatopathologie  
Hamburg

**Paying customer** of our service



Approached us to build a **payed** prototype

**SYNLAB**



Cooperation partner; **convert to paying customer** after validation in live setting



**LABOR 28**  
BERLIN

Early adopter, **convert to paying customer** after validation of diagnoses



*“hemato’s quantitative diagnosis is **revolutionary**”*

**Early adopter**

Dr. Cassano Juan Carlos  
Zentrum für Labormedizin

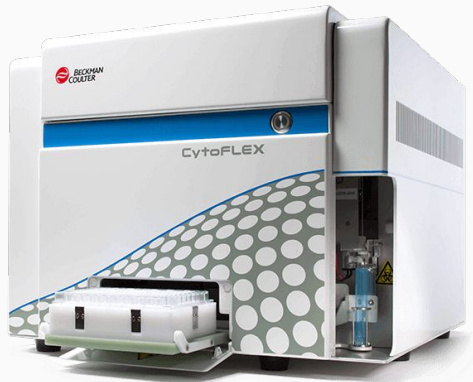
Additional potential customers that already handed over data:



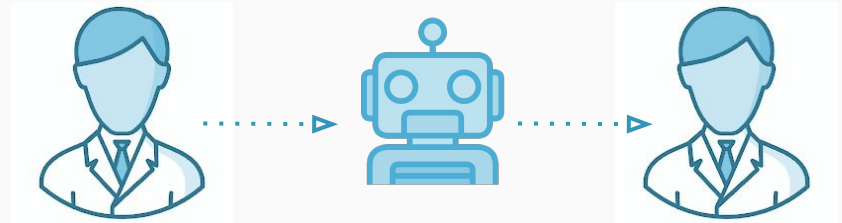
# Competition

*Our competitors are not automating the entire workflow*

**Device manufacturers:**  
conventional (manual) software

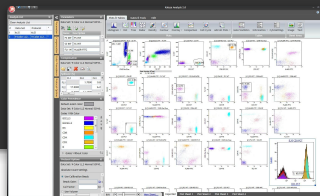


**Tech startups:**  
partial automation, no end-to-end diagnosis

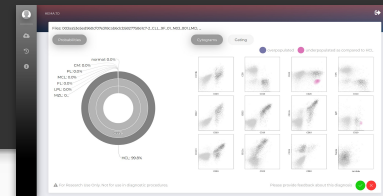


# USPs

## LEGACY SOFTWARE



## HEMATO



**PREPROCESSING**

manual

automatic

**TIME TO DIAGNOSIS**

minutes to hours

seconds

**RESULTS**

qualitative, inter- & intra-observer variability

quantitative & reproducible

**POST PROCESSING**

manual

automatic highlighting of suspicious cells

**IMPLEMENTATION**

on-prem, delayed updates, upfront fees

SaaS, continuous updates, variable fees

# Factsheet

*We've put ourselves in an excellent position to scale*

4  
publications

ASH [1] [2]  
Cytometry Part A [3]  
Cell Patterns [4]

€151k  
public  
funding

€ 99k BayTOU for F&E  
€ 16k WIPANO for 2 patents  
€ 36k Start?Zuschuss!

99.7%  
accuracy

In case of:  
infiltration >1%  
confidence >95%

+4k  
processed  
cases

↓ 50% miss-diagnoses  
↓ 90% colors required  
↑ 80% faster

+150k  
validated  
datasets

We own one of the  
largest data sets  
in the world

18  
cooperations

SYNLAB

CHARITÉ  
UNIVERSITÄTSMEDIZIN BERLIN

Universitätsklinikum  
Erlangen

SONIC  
HEALTHCARE

IGSB

UNIVERSITÄT  
BONN

UNIVERSITÄT  
BONN

Universitätsklinikum  
Essen

# Milestones

*Our vision: capture the leukemia diagnosis market with a comprehensive diagnostic platform*

Working prototype



First diagnoses validated



Hire the Team to rapidly execute our dev.- & go-to-market strategy

**March 2022**



Reach profitability. Scale across Europe (Synlab, Sonic Healthcare)

**2022-2023**



Enter US market and scale globally

**2025**



First paying customer

**2021**



Secure pre-seed funding



***We raised 500k to tackle this technical challenge***

**May 2022**

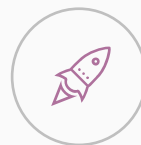
Get certified (IVDD), first subscriptions



***Seed funding round (+2M)***

**2023-2024**

Integrate further diagnostics



# Requirements

**We are looking for motivated cooperation partners and up to 3M seed funding.**

With this seed funding, we:

- scale across the ca. 650 labs in Europe (expand marketing and sales teams)
- get reimbursed for our improved diagnostic quality (4B revenue stream) <sup>1</sup>
- commercialize integrated diagnosis (see “Vision”)

With this, we project to be profitable by October 2023 and to achieve a 5% market capture <sup>2</sup> by 2025.

1) Assuming a fee of 100 E per diagnosis (ca. 20% of the hidden cost of misdiagnosis) for 40M yearly diagnoses.

2) Assuming 6 new free trials per month and sales/marketing employee and a 25% conversion rate after the trial phase.



# Our vision

“We don’t know how to combine  
the diagnostics for 10-20% of  
our patients”  
*Dutch hematologist*

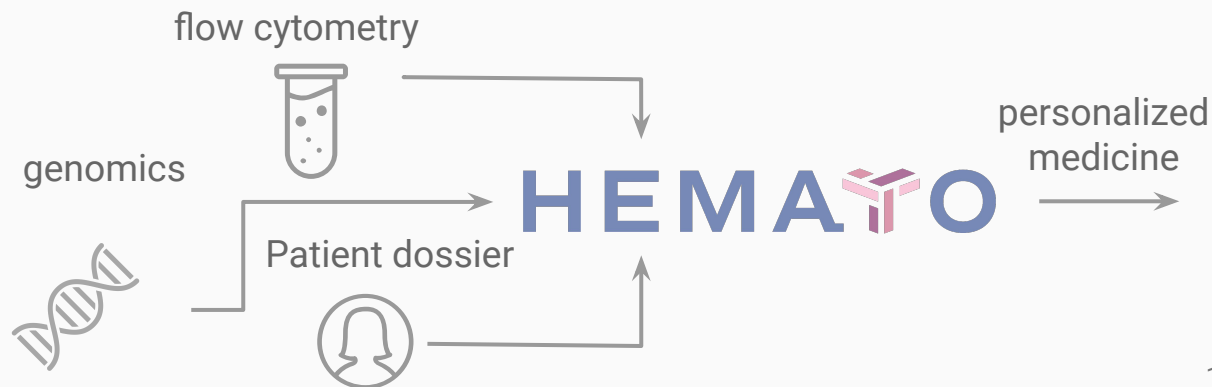
Increasingly precise and personalized treatment options

Increasingly diverse and complex diagnostics

Correctly interpreting multiple data sources therefore becomes  
**increasingly relevant**, but also **increasingly challenging**.

Clinicians need a **comprehensive platform** to integrate all diagnostics.

Our vision:  
use AI to integrate  
multiple measurements  
for a **highly precise  
diagnoses &  
treatments**.



# Team

*We combine the necessary skills in science, tech, and business*



**Founder (business)**  
Dr. Hannes Lüling

Hannes holds a PhD in comput. Neuroscience and has a **decade of experience** in both DAX companies and startups. His role is managing director as well as representative of hema.to.



**Founder (AI)**  
Dr. Franz Elsner

Franz is a former cosmologist and our AI expert. He is the creator of a multitude of novel approaches for data analyses in over **120 peer-reviewed publications**.



**Founder (tech)**  
Felix Kunzweiler

Felix is a full stack data scientist with a M.Sc. in physics. He has gathered a deep understanding of the development of **cloud applications and AI-based** web services.



**Founder (product)**  
Dr. Karsten Miermans

Karsten is our in-house generalist with a **background in AI and biophysics**. As CPO, he ensures that the technology behind hema.to is transformed into a great product.



**Medical advisor**  
Dr. med. Richard Schabath  
Founder of a hematological lab in downtown Berlin.



PRAXIS FÜR  
HÄMATOLOGIE UND ONKOLOGIE  
BERLIN MITTE



**Research advisor**  
Prof. Dr. med. Peter Krawitz  
Director of the Institute for Genomic Statistics and Bioinformatics of the University of Bonn.

