



**Investor Road Show
Presentation Q2 2023**

Lund, July 20, 2023



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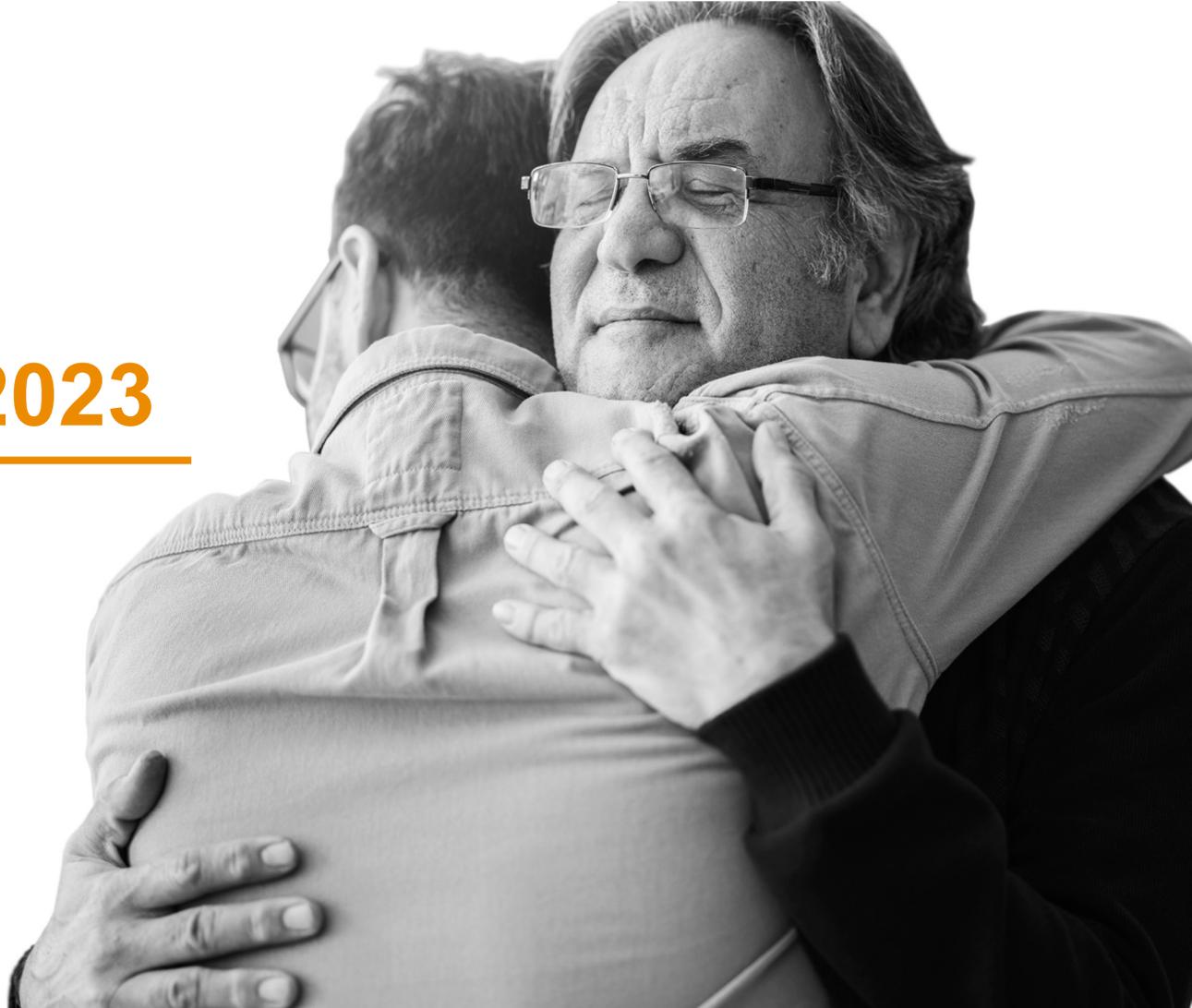
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Business update Q2'2023



Solid commercial performance in Q2 and advancements across all four franchises

1 Advancing the EU launch

- ✓ Solid sales performance in Q2'23; Sales doubled vs. Q1'23
- ✓ Desensitization clinical guidelines in five countries and Eurotransplant program
- ✓ Provisional approval in Australia in both living and deceased donor

2 Accelerating science across all franchises

- ✓ 76 patients enrolled in US ConfIdaS phase 3 trial
- ✓ First patients treated in ANCA-associated vasculitis phase 2 trial and anti-GBM phase 3 trial
- ✓ Gene therapy collaboration with Genethon in Crigler-Najjar syndrome
- ✓ Enrollment completed in HNSA-5487 phase 1 trial

3 Total Q2 revenue: 36.7m; Hansa financed into 2025

- ✓ SEK 29.6m in product sales
- ✓ SEK 7.1m in revenue recognition from partnerships
- ✓ Cash position: SEK 1.1bn (Q2'23)
- ✓ Write-up of SEK 1.4bn in intangible assets related to Idefirix®; Will increase Shareholder Equity

Scaling Idefix[®] globally as we transform the desensitization treatment landscape and advance a new way of transplanting patients

1 Build the foundation for Idefix[®]

- ✓ Commercialize in early-launch countries
- ✓ Secure Market Access in key markets
- ✓ Ensure clinical readiness/KOL engagement
- ✓ Implement medical guidelines (ESOT and country specific guidelines)
- ✓ Increase awareness on unmet need
- ✓ Initiate post approval study in Europe
- ✓ Support patient and organ access

2 Expanding internationally

- Leverage experience to scale Idefix in Europe
- Secure FDA approval and launch in the U.S.
- Geographical expansion beyond core markets
- Full marketing authorization in Europe

3 Potential label expansion

- Potentially expand into living donor transplantation
- Potentially expand into other solid organs

Key activity matrix

Commercial sales uptake



Eurotransplant pilot program set to transform desensitization and increase clinical experience with imlifidase

Acceptable Mismatch Priority Program

CURRENT

Acceptable Mismatch (AM) Program

Allocates organs to patients who are immunologically compromised because of current and/or historic HLA-sensitization

20 patients to be included in the Pilot program in rounds of five

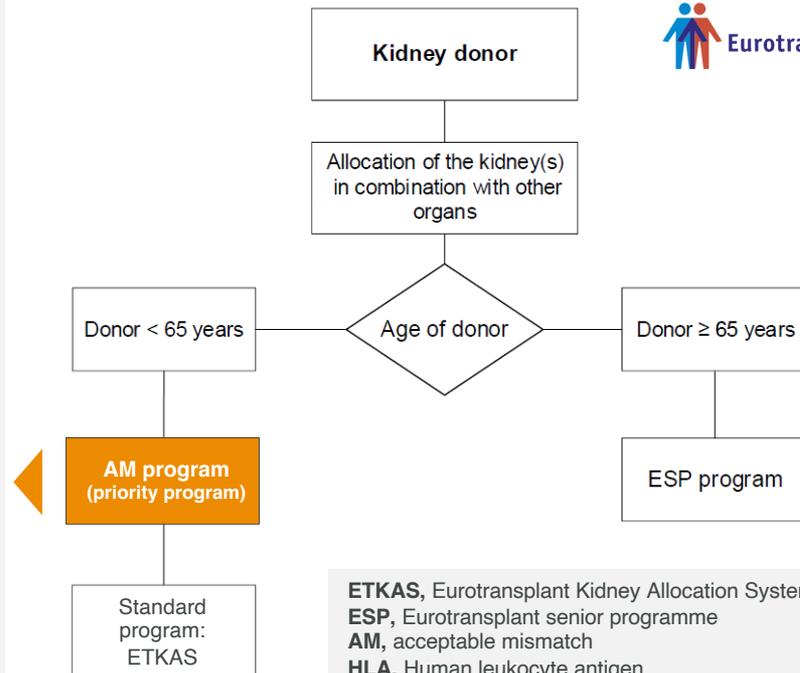
NEW PILOT

Eurotransplant Desensitization Program

Imlifidase-eligible patients who are incompatible to a deceased donor

Inclusion criteria for new program

- No age limitation for patients
- Donor below 65 years
- A minimal waiting time of 3 years in the AM program
- Final transplant center CDC crossmatch must be negative
- Informed consent form for a follow-up data



Idefirix receives provisional approval in Australia

First market to approve use in transplants from both living and deceased donors

Australian kidney disease and transplantation statistics

~15,200 patients suffer from ESRD and receive dialysis

1,338 patients were waitlisted for a kidney transplant from deceased donors in 2021

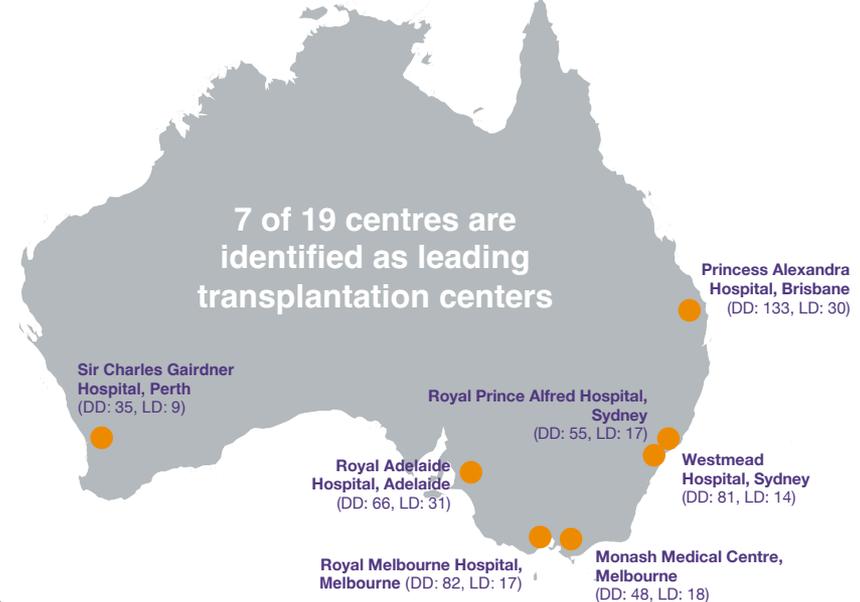
857 kidney transplantations were carried out in 2021

~21% of patients waitlisted have a cPRA score of 95 or higher

76/24 deceased vs living donor transplantations

Full approval in Australia will require submission to the TGA of further safety and efficacy data from studies that are currently underway (e.g. long-term follow-up, Post Approval Study and U.S ConfIdes study)

Kidney transplantation landscape in Australia



Sources:

1. ANZDATA. The Australia and New Zealand Dialysis and Transplant Registry (ANZDATA) collects information about people receiving dialysis or kidney transplant for end-stage kidney disease in Australia and New Zealand.
2. ANZDATA 2022 Annual Report #45; available at: <https://www.anzdata.org.au/report/anzdata-45th-annual-report-2022-data-to-2021/>

New investigator-initiated phase 2 study in ANCA-associated vasculitis

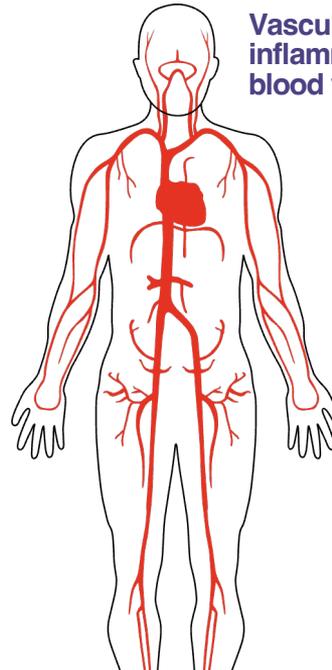
- a group of autoimmune diseases characterized by inflammation of blood vessels with very few treatment options today

Incidences

~3 in 100,000 annually across EU/US of which 8-36% are estimated to have ARDS due to pulmonary hemorrhage^{1,2}

Standard of Care

- Current protocol is Immunosuppression and Intensive support care



Vasculitis means inflammation of blood vessels

The investigator-initiated trial (IIT) is sponsored by Charité Universitätsmedizin, Berlin



Indication

- Causes damage to small blood vessels in the body resulting in inflammation and damage to organs, such as the kidneys, lungs etc.³
- Progress of the disease results in end stage kidney disease in 25 percent of patients⁵
- Most severe cases involving lungs lead to respiratory failure⁴
- Few treatment options today

Study design

- Single arm, single center, phase 2 study with the primary objective to evaluate efficacy and safety on top of SoC
- 10 patients with severe ANCA-associated vasculitis and Acute Respiratory Distress Syndrome will be treated with imlifidase on top of SoC
- First patient treated Q2 2023
- Trial led by Dr. Adrian Schreiber and Dr. Philipp Enghard at Charité

1. Bertl A, et al. Arthritis Rheum atol. 2017;69.
2. Rathmann J, et al. RMD Open. 2023;9:e002949.
3. Falk RJ, Jennette JC. The New England journal of medicine. 1988;318(25):1651-7.
4. Flossmann O, et al. Annals of the rheumatic diseases. 2011;70(3):488-94.
5. Booth AD, et al. American journal of kidney diseases. 2003;41(4):776-84.

Solid progress in our valuable pipeline of drug candidates across our franchises

U.S. Confides kidney tx

Phase 3

- 76 patients enrolled for randomization
- Plans to expand number of centers from currently 14 to 20 or more sites to accelerate randomization
- Randomization expected to be complete H2 2023

Decision to overenroll

Anti-GBM disease

Phase 3

- 4/50 patients enrolled
- Open-label, randomized controlled study
- 50 patients to be treated with imlifidase and SoC or SoC, alone
- First patient treated in Q2

Initiated

Guillain-Barré Syndrome (GBS)

Phase 2

- 30/30 patients enrolled
- Topline data expected H2 2023
- Full data following comparative efficacy analysis with the IGOS database expected 2024

Completed

Antibody Mediated Rejection (AMR)

Phase 2

- 30/30 patients enrolled
- Topline data showed statistical significance in rapidly reducing DSAs levels vs SoC
- Full data read-out expected H2 2023

Completed

ANCA associated vasculitis

Phase 2

- 10 patients with severe ANCA-associated vasculitis will be treated with imlifidase on top of SoC.
- Study is single center, single arm to evaluate efficacy and safety
- First patient treated Q2'23

Initiated

- Patients enrolled
- Patients remaining

Broad clinical pipeline in transplantation and autoimmune diseases

Candidate/ Project	Indication	Research/ Preclinical	Phase 1	Phase 2	Phase 3	Marketing Authorization	Marketed	Next Anticipated Milestone
Imlifidase	EU: Kidney transplantation in highly sensitized patients ^{1,2}	Completed	Completed	Completed	Planned	Completed	Ongoing	EU: Additional agreements around reimbursement / Post approval study to be completed by 2025
	US: Kidney transplantation in highly sensitized patients ^{1,2}	Completed	Completed	Completed	Ongoing			Completion of randomization (64 patients) H2 2023
	Anti-GBM antibody disease ³	Completed	Completed	Completed	Ongoing			Complete enrollment (50 patients)
	Antibody mediated rejection in kidney transplantation (AMR)	Completed	Completed	Ongoing				Full data read out H2 2023
	Guillain-Barré syndrome (GBS)	Completed	Completed	Ongoing				Topline data H2 2023 / Comparative efficacy analysis 2024
	ANCA-associated vasculitis ⁴	Completed	Completed	Ongoing				Complete enrollment (10 patients)
	Pre-treatment ahead of gene therapy in Duchenne (Partnered with Sarepta)	Ongoing	Planned					Initiate clinical study of imlifidase as pre-treatment in DMD 2023
	Pre-treatment ahead of gene therapy in Limb-Girdle (Partnered with Sarepta)	Ongoing						Preclinical research
	Pre-treatment ahead of gene therapy in Pompe disease (Partnered with AskBio)	Ongoing						Preclinical research
	Pre-treatment ahead of gene therapy in Crigler-Najjar syndrome (Partnered with Genethon)	Ongoing						Preclinical research
HNSA-5487	Lead molecule from second-generation IgG antibody cleaving enzymes (NiceR)	Completed	Ongoing					Completion of phase 1 (H2 2023)

Completed
 Ongoing
 Planned
 Post approval study running in parallel with commercial launch

¹ Results from the Phase 1 study have been published, Winstedt et al. (2015) PLOS ONE 10(7)

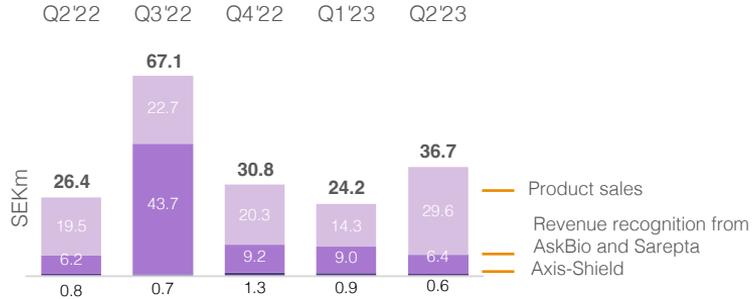
² Lorant et al., American Journal of Transplantation and 03+04 studies (Jordan et al., New England Journal of Medicine)

³ Investigator-initiated study by Mårten Segelmark, Professor at the universities in Linköping and Lund, Sweden

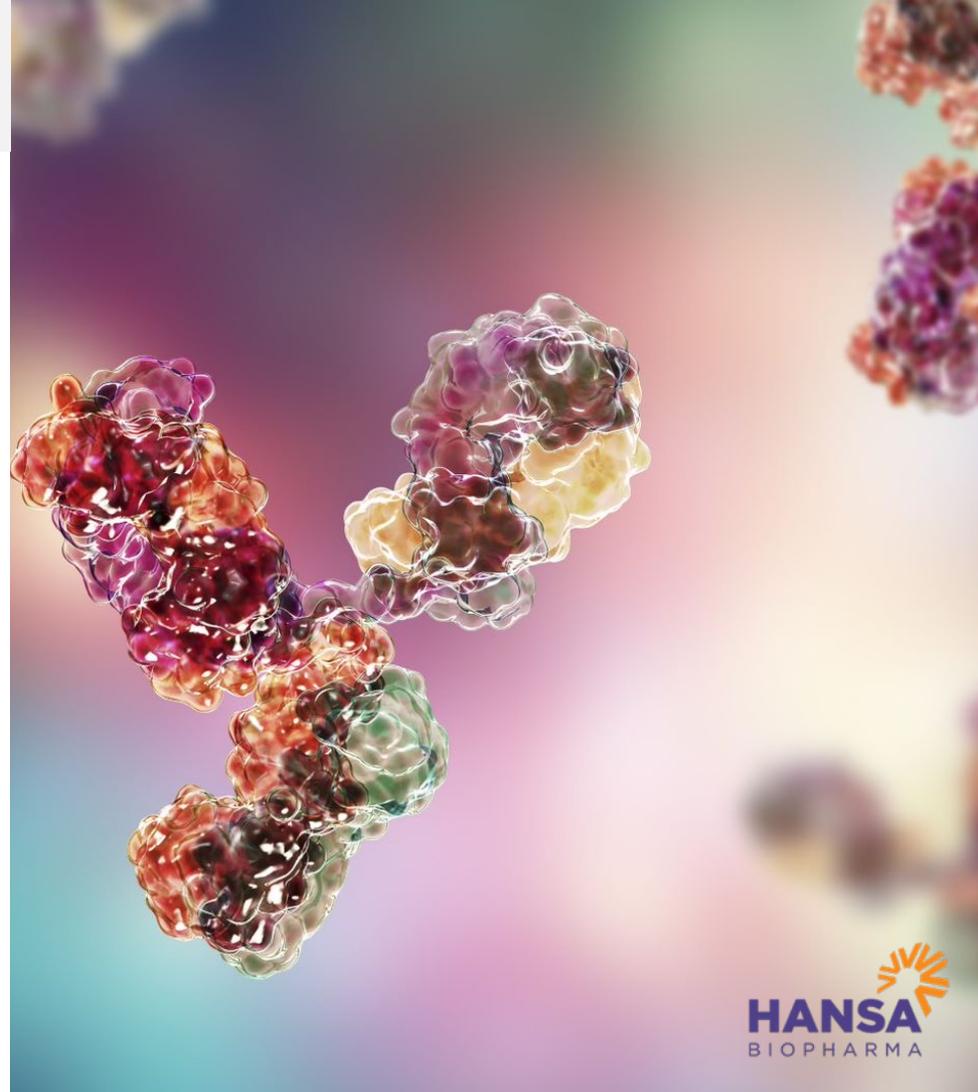
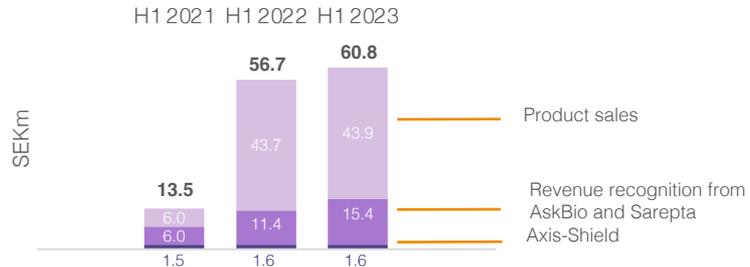
⁴ Investigator-initiated study by Dr. Adrian Schreiber and Dr. Philipp Enghard, at Charité Universitätsmedizin, Berlin, Germany

Q2 2023 Revenue amounted to SEK ~37m including SEK ~30m in product sales

Revenue (Q/Q)



Revenue (H1/H1)



Continued investments in commercialization and R&D activities

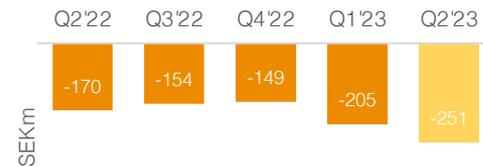
SG&A expenses (Q/Q)



R&D expenses (Q/Q)



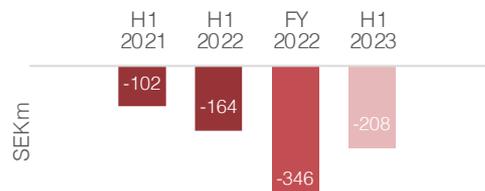
Net loss (Q/Q)



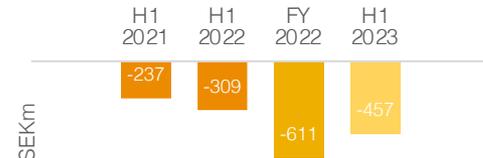
SG&A expenses (H1/H1)



R&D expenses (H1/H1)

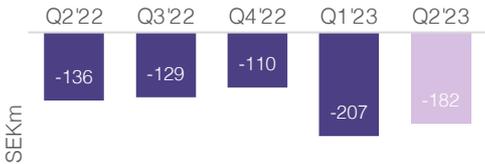


Net loss (H1/H1)



With current cash position and projected burn-rate, Hansa's operations are financed into 2025

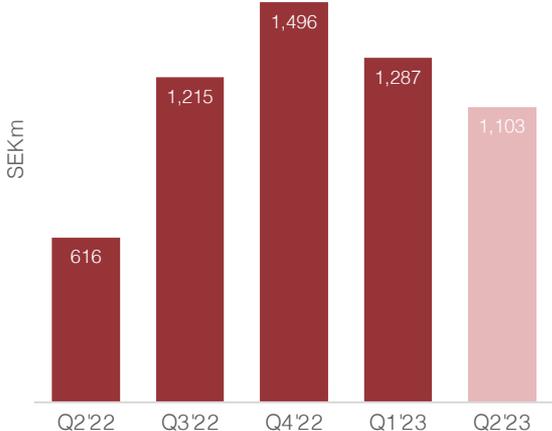
Operating cash flow (Q/Q)



Operating cash flow (H1/H1)



Cash & short-term investments (Q/Q)



Number of employees (Q/Q)



Achieved and upcoming milestones

2023		2024
H1 2023	H2 2023	
<ul style="list-style-type: none"> ✓ U.S. ConfideS (Kidney tx) Phase 3: Complete enrollment ✓ Anti-GBM disease Phase 3: First patient enrolled ✓ GBS Phase 2: Complete enrollment ✓ ANCA-associated vasculitis Phase 2: First patient enrolled ✓ HNSA-5487 (Lead NiceR candidate): Initiate Phase 1 study ✓ Genethon Crigler-Najjar: Initiate preclinical study with imlifidase prior to GNT-0003 	<ul style="list-style-type: none"> - U.S. ConfideS (Kidney tx) Phase 3: Complete randomization - GBS Phase 2: First data readout - AMR Phase 2: Full data readout - Long-term follow-up (Kidney tx): 5-year data readout - Sarepta DMD pre-treatment Phase 1b: Commence clinical study - HNSA-5487 (Lead NiceR candidate): Completion of Phase 1 study 	<ul style="list-style-type: none"> - U.S. ConfideS (Kidney tx) Phase 3: BLA submission - GBS Phase 2: Outcome of the comparative efficacy analysis to IGOS data - Genethon Crigler-Najjar Phase 1/2: Initiate clinical study with imlifidase prior to GNT-0003

Company overview



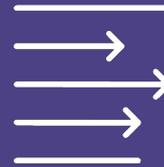
Hansa Biopharma today

A successful track record and a promising future...



A validated technology

- ✓ Commercial stage biotech company
- ✓ Approval in kidney transplantation (EU)
- ✓ Market Access in 13 European markets
- ✓ PoC in autoimmune diseases
- ✓ Three partnerships in gene therapy



Broad clinical pipeline

- Imlifidase being investigated in seven ongoing clinical programs in transplantation and autoimmune disease
- Planned clinical study in gene therapy
- Next generation IgG antibody-cleaving enzymes program in phase 1



Skilled and experienced team

- A high-performance organization with 20 years on average in life science
- Purpose driven culture
- Headquartered in Lund, Sweden with 162 employees (March 2023)
- Operations in both EU and the US



Financial position

- Hansa is financed into 2025
- Market cap (USD): ~228m (July 2023)
- Listed on Nasdaq Stockholm
- 20,000 shareholders
- Foreign ownership make up ~43%

We are building a global leader in rare diseases

Today

We are launching our first commercially approved product for enablement of kidney transplantation in Europe*

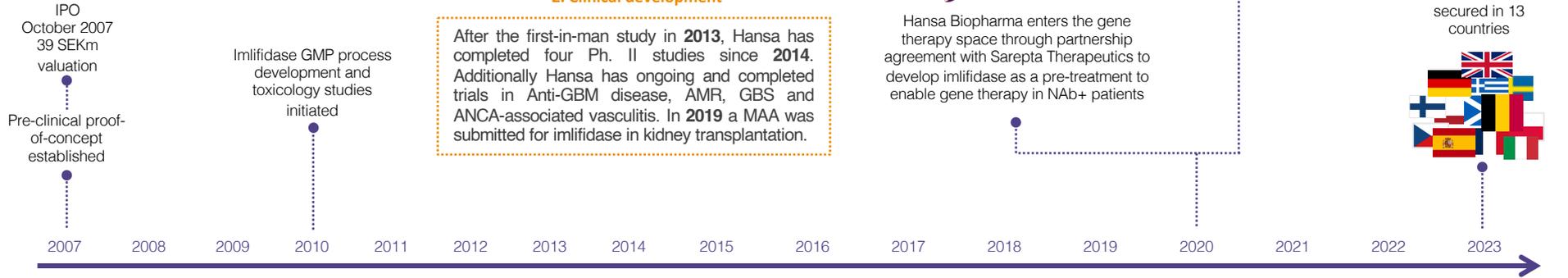


Tomorrow

We envision a world where patients with rare immunologic diseases and conditions can lead long and healthy lives



Hansa Biopharma's history



1. Turning foe into friend

The therapeutic potential in using a bacterial enzyme with specificity for IgG-antibodies, to neutralize pathogenic antibodies was discovered around **2006**. The original enzyme, IdeS, has been developed by *Streptococcus pyogenes* over thousands of years and by transferring a majority of the IdeS coding nucleotide into harmless *E. coli*-bacteria, the IgG-cleaving part of the IdeS molecule can be expressed and purified, resulting in the Hansa Biopharma drug imlifidase, i.e., turning a former foe to a friend.

First-in-man study

First Ph. II study of imlifidase in kidney transplantation

Starts trading on NASDAQ Stockholm main board

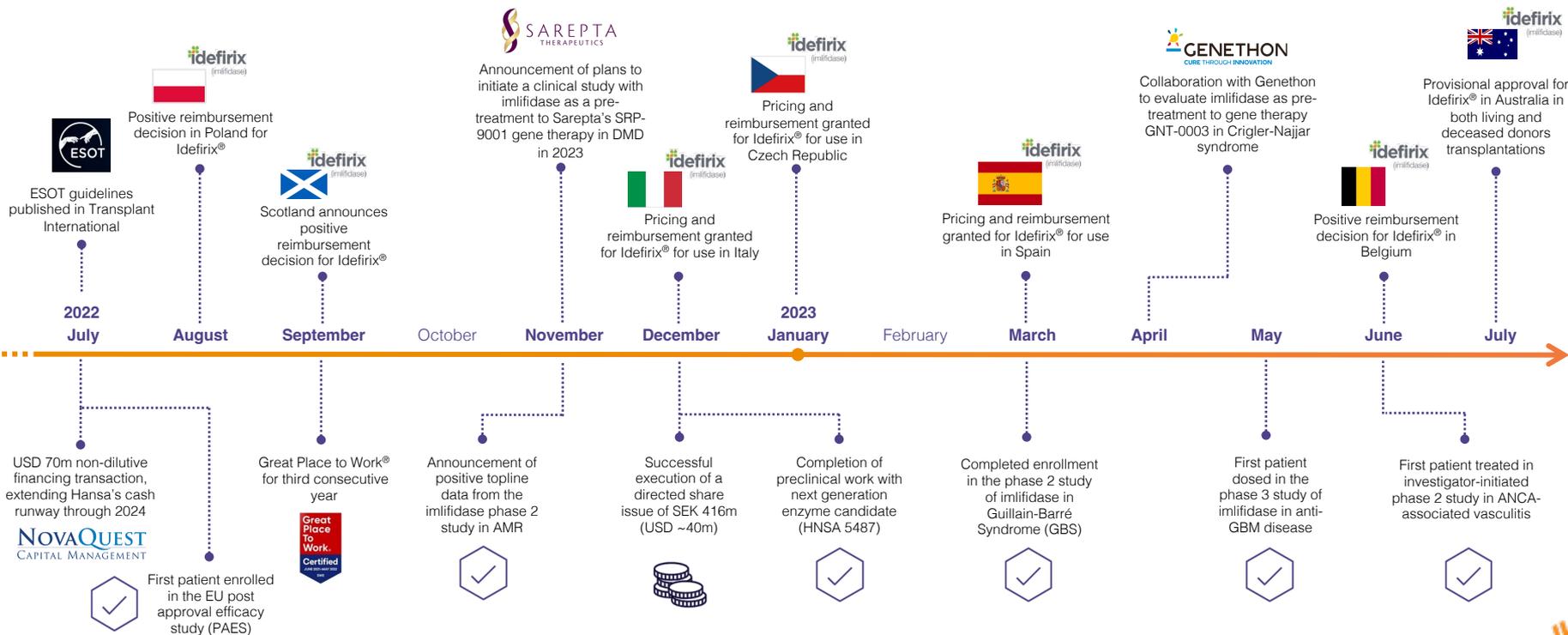
3. Commercialization

In August **2020**, Hansa received conditional approval for Idefirix (imlifidase) in kidney transplantation. Additionally, Hansa entered into the gene therapy field through a commercial partnership with Sarepta Therapeutics. Thus far, Hansa achieved market access in 13 European markets including the five largest markets. Market access procedures are ongoing in additional countries.

Hansa Biopharma enters into collaborations Medison (commercial), AskBio and Genethon (both gene therapy)



Key milestones achieved during the last 12 months



Imlifidase

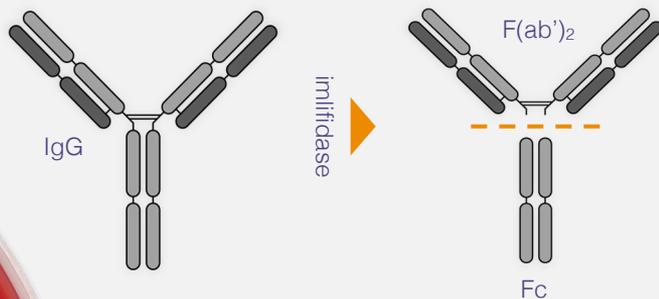
a novel approach to eliminate pathogenic IgG

Origins from a bacteria *Streptococcus pyogenes*

- Species of Gram-positive, spherical bacteria in the genus *Streptococcus*
- Usually known from causing a strep throat infection

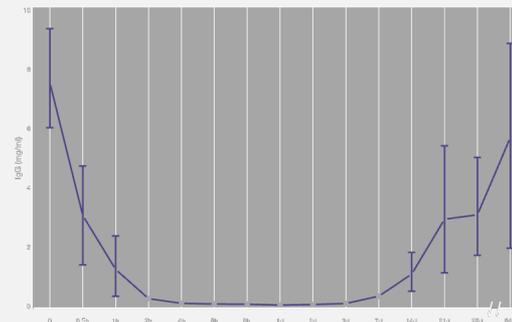
A unique IgG antibody-cleaving enzyme

- Interacts with Fc-part of IgG with extremely high specificity
- Cleaves IgG at the hinge region, generating one F(ab')₂ fragment and one homo-dimeric Fc-fragment



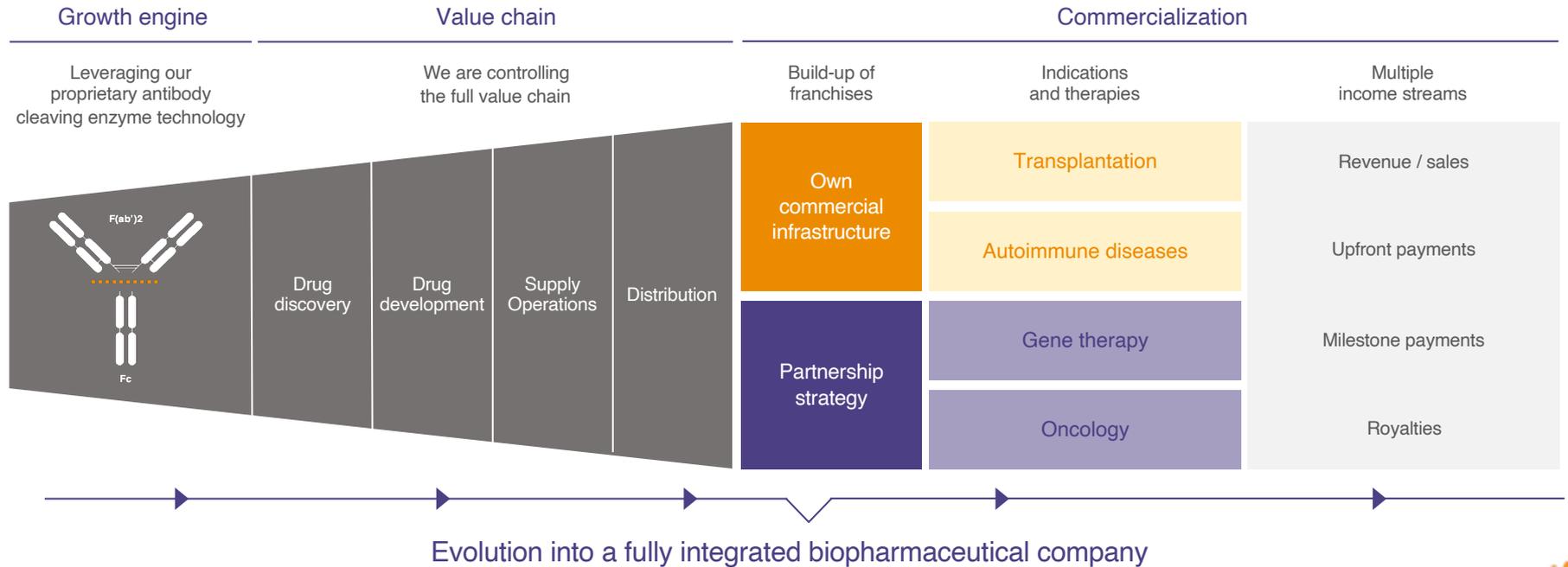
Inactivates IgG in 2-6 hours

- Rapid onset of action that inactivates IgG below detectable level in 2-6 hours
- IgG antibody-free window for approximately one week

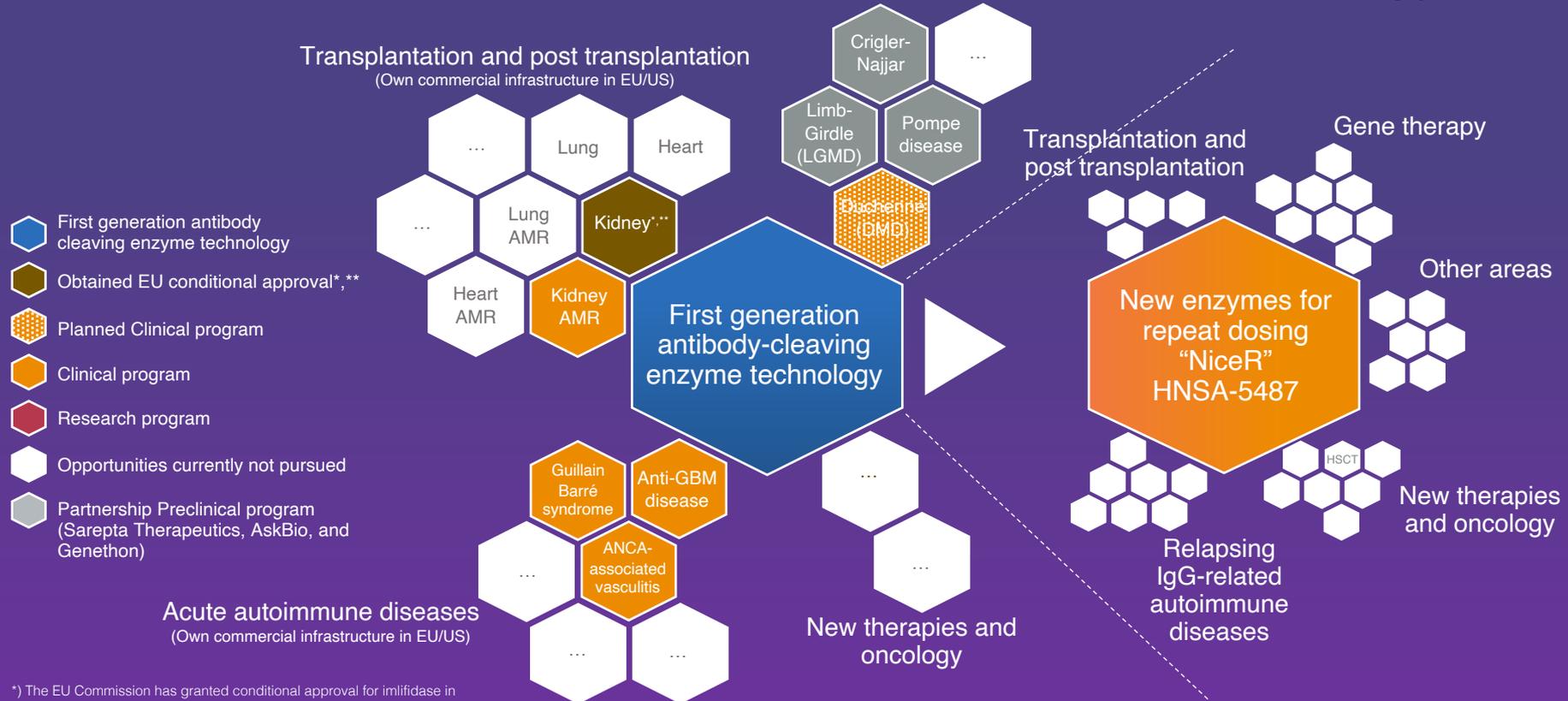


Our Business model

Leveraging our technology platform to develop new therapies targeting rare diseases with unmet medical need across a range of indications



Potential indication universe



*) The EU Commission has granted conditional approval for imlifidase in highly sensitized kidney transplant patients.

**) In the US a new study has commenced targeting a BLA filing in 2024

Our strategic priorities

Our mission is to become a global leader in rare diseases



Commercialize Idefirix® in first indications and markets

- Successfully launch Idefirix® in Europe
- Secure FDA approval and launch Idefirix® in the U.S.
- Geographical expansion



Advance ongoing imlifidase clinical programs in transplantation and autoimmune diseases

- Achieve approval/usage of imlifidase in follow-on indications
- Broaden our Idefirix® label beyond kidney transplantation



Expand IgG-cleaving enzyme technology platform into new disease areas and indications

- Explore gene therapy opportunity
- Explore opportunities in Oncology and stem cell transplantation (HSCT)
- Develop our next generation IgG-cleaving enzymes to allow for recurring treatment

Build focused, integrated, agile and empowered international organization and seek partnerships to accelerate growth and reduce risk

Becoming a fully integrated commercial stage biopharmaceutical company

while expanding our technology and global footprint



Pre-clinical

Early-stage clinic

Late-stage clinic

Commercial stage

1

Creating a scientific platform

- Advanced imlifidase from preclinical models through to approval
- Initiated clinical studies in transplantation in EU and the US
- Built the R&D organization
- Validated through peer-reviewed publications (e.g. NEJM and AJT)

2

Preparing the company for commercial success

- Completion of four phase 2 studies in transplantation
- Development of GMP process
- Expanded the pipeline to post-transplantation and autoimmunity
- Established corporate and medical functions
- Expanding the footprint in EU and US

3

Building and capturing value in new indications and markets

- First drug approval in kidney transplantation in EU*
- Commercialization
- Market Access secured in 13 countries, including the five largest European markets
- Expanding commercial teams and adding territory management
- Securing supply chain management
- Progressing pipeline and advancing our technology footprint

Our culture is driven by people passionate about making changes



Purpose driven culture

Helping patients with rare diseases serves as a **strong purpose** for our colleagues to **go the extra mile**



Diverse and international

~45%
Internationals across
~30 nationalities

~55/45
Male/female gender split in
the leadership team



Skilled and experienced team

>50%
With relevant PhD in R&D

~20 years*
of life science experience
on average from
Big Pharma, Biotech
and Academia

*covers Management, R&D, and Commercial functions



Motivated workforce

For second consecutive year Hansa is certified as a “Great Place to Work” with **100%** participation rate in the survey



Experienced Board and Executive Committee

Extensive experience from the global healthcare industry

Executive Committee



Søren Tulstrup

President & CEO (2018)
+30 years in the Healthcare sector
Ex-CEO at Vifor Pharma
Ex-SVP at Shire Pharmaceuticals
Ex-CEO at Santaris Pharma
Shareholding: 26,541



January 30, 2023, it was announced that CSO/COO Christian Kjellman had decided to leave the company in 2024. Achim Kaufhold will assume an interim role as CSO, while a search is underway for a new Chief Scientific Officer.



Donato Spota

SVP & CFO (2019)
+20 years in the Healthcare sector
Ex-CFO Basilea Pharmaceutica
Senior Finance roles at Roche
Shareholding: 5,673



Achim Kaufhold

SVP & CMO (2020) and interim CSO
+40 years in the Healthcare sector
Ex-CMO Basilea Pharmaceutica
Ex-CEO Affitech (merged with Pharmexa A/S)
Ex-CMO Chiron (acquired by Novartis)
Shareholding: 0



Matthew Shaulis

CCO & US President (2023)
+20 years in the Healthcare sector
Ex-SVP Global Commercial and Medical Go-To-Market model transformation at Pfizer Inc.
Shareholding: 0



Anne Säfström Lanner

SVP & CHRO (2019)
Ex-Head of HR European Spallation Source
Ex-Head of HR Cellavision
Shareholding: 3,565



Peter Nicklin

Chairman (2022)
+30 years in the Healthcare sector
Chairman of Tunstall Healthcare, Sciensus & Versantis
Held senior executive roles at Baxter, Bayer, Novartis & Bristol-Myers Squibb
Shareholding: 14,500



Hilary Malone

Board Member (2021)
COO at Valo Health (US)
Chief Regulatory Officer & Head of Global Regulatory Affairs at Sanofi (2013-2019)
SVP & Head of Worldwide Regulatory Strategy at Pfizer (2009-2011)
Shareholding: 0



Anders Gersel Pedersen

Board Member (2018)
+30 years in the Healthcare sector
Ex-EVP R&D H.Lundbeck
Chairman of Hansa Biopharma's Scientific Committee
Shareholding: 2,500



Eva Nilsagård

Board Member (2019)
Board member of several companies, e.g. Adolife, Bufab, Irras, Abirane
Ex-CFO of Vitrolife and Plasta
Chairman of Hansa Biopharma's Audit Committee
Shareholding: 3,000



Mats Blom

Board Member (2019)
CFO of NorthSea Therapeutics
Ex-CFO Zealand Pharma
Member of Hansa Biopharma's Audit Committee
Shareholding: 1,000



Andreas Eggert

Board Member (2018)
Ex-SVP at H. Lundbeck A/S
Ex-VP Wyeth/Pfizer in the U.S.
Member of Hansa Biopharma's Audit Committee and Remuneration Committee
Shareholding: 5,500

Hansa Biopharma's Governance Structure

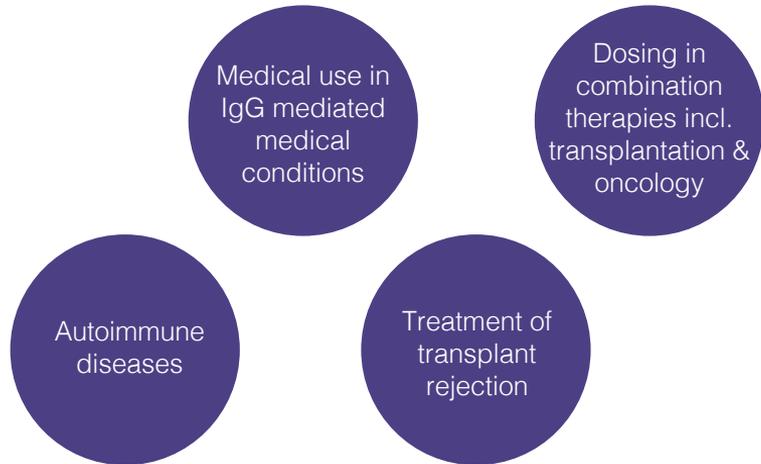


 Electing / Appointing
 Reporting / Informing

Strong technology protection through patents and orphan drug designations

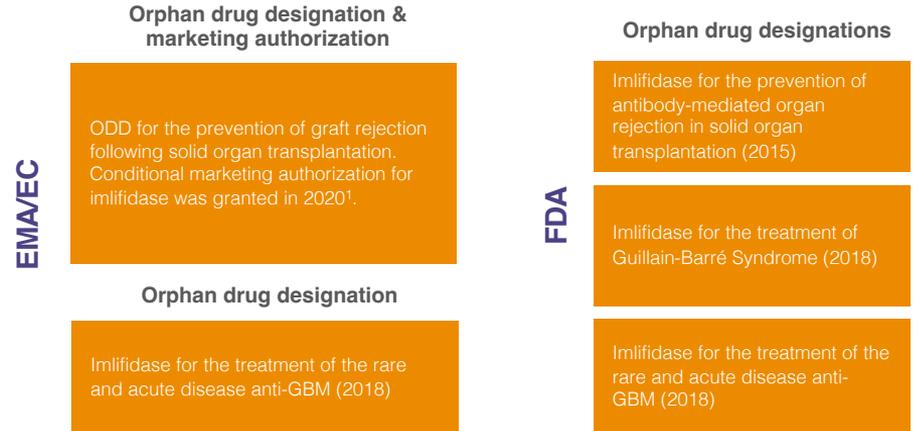
Patent coverage out to 2035 in key markets

- Our lead product, imlifidase, is protected by six patent families including both granted patents and pending applications and cover the use of isolated imlifidase
- Patents cover use of isolated imlifidase at least in:



Orphan drug designation

- Orphan drug designation is granted to drugs intended for rare diseases (affecting max 5 patients in 10,000 persons in EU or affecting less than 200,000 patients in the US)
- The designation provides development and commercial incentives, including ten years of market exclusivity in the EU and seven years in the U.S., protocol assistance on the development of the drug, including clinical studies and certain exemptions from or reductions in regulatory fees



Hansa Biopharma is financed into 2025

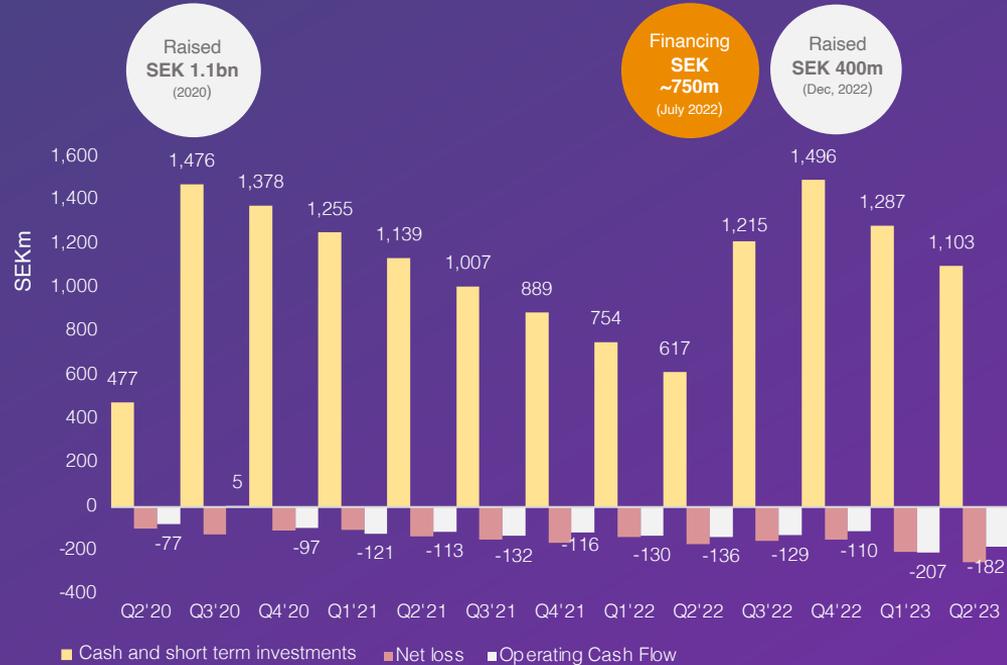
Financing to support the continued development of Hansa's antibody-cleaving enzyme technology platform and commercial preparations toward regulatory approval in the U.S.

Capital Raised
SEK ~4bn
since 2007*

R&D investment
(acc.)
SEK ~1.5bn
(Since 2007)

SG&A spend
(acc.)
SEK ~1.4bn
(Since 2007)

Cash position
SEK ~1.1bn
(June, 2023)



*Including SEK ~750m from NovaQuest financing agreement & SEK ~100m upfront payments from Sarepta

Mid-term financial priorities

Our key financial priorities over the coming years will be focused on ensuring a successful European launch of Idefirix[®], while targeting mid-term product profitability

**With the recent financing Hansa is fully financed into 2025
We expect to use our current cash position to:**

Fund the launch and commercial expansion of Idefirix[®] in kidney transplantation across Europe and start preparations for a potential launch in the U.S.

Complete our EU post-approval commitments and patient enrollment in our ConfideS study as well as advance in our long-term follow-up study to the five-year data readout in 2023

Strengthen ongoing product development activities and expand the Company's R&D pipeline, including AMR, GBS, and anti-GBM disease

Advance our next generation enzymes (HNSA-5487) into clinical development as well as our initiatives in our other indications such as gene therapy and oncology

Fund working capital and general corporate purposes

SEK ~1.1bn

(USD ~101m)

in cash and short-term investments
post recent financing



Strategic plan to build U.S. presence ahead of potential regulatory approval and commercial launch of imlifidase in the US

Three shots on goal to enter important US market



US pivotal phase 3 study in kidney transplantation



Pivotal phase 3 study in anti-GBM disease



Pre-treatment to SRP-9001 in Gene Therapy (DMD)

Critical functions to be established

- Small and agile team with deep clinical and US marketplace expertise
- Comprehensive functional coverage with dedicated US based and experienced team members
- Strength of global strategy and key global functions

Timeline



US functions to be established over time		
US Market Access	US Marketing	US Regulatory
Supply Chain/Distribution	US Key Account Mgmt	US Clinical Operations
US Commercial Operations	US Medical Affairs/MSLs	US ISTs & Outcomes
US HR	US Finance/Corporate	US Legal/Compliance

An exciting journey ahead!

✓ This is just the beginning!

- ✓ Clinical validation
- ✓ External validation
- ✓ Regulatory validation
- ✓ Validated manufacturing
- ✓ Strong IPR
- ✓ Exciting pipeline
- ✓ Strong team

Key milestones to be achieved

- Expand Idefirix® label in transplantation and in other solid organs
- Expand our platform and obtain regulatory approval in indications beyond kidney transplantation
- Advance our lead second generation molecule HNSA-5487 successfully through phase 1 and identify first relevant indication area
- Expand partnerships in gene therapy and oncology
- Advance imlifidase as pre-treatment into Limb-Girdle, Duchenne, Pompe Disease and Crigler-Najjar syndrome in gene therapy
- Show PoC in new indications such as oncology
- Advance potential combination treatment into the clinic

Idefirix® approved in EU under conditional approval for kidney transplantation

Our future

Hansa Biopharma is a recognized global leader in rare diseases across multiple broad therapeutic areas with several market leading products and a highly valuable pipeline of late stage drug candidates



Stock images

Imlifidase in kidney transplantation



Idefirix[®] is the first and only approved drug in Europe for desensitization of highly sensitized kidney transplant patients

Between 80,000 and 100,000 kidney transplant patients are waiting for a new kidney in both Europe and the U.S. Availability of organs remain a big challenge since only 1 in 4 patients are offered access to a lifesaving transplantation, while many highly sensitized patients are unlikely to be transplanted even under current prioritization programs

Low complexity transplants

High complexity transplants



First patient experiences with Idefirix in highly sensitized kidney patients post approval published

54-year-old man successfully transplanted at Vall d'Hebron, Barcelona after two failed transplantation attempts in the 90s and being on dialysis since 1984

[Link article from Vall d'Hebron news forum August 25, 2022](#)



29-year-old woman transplanted at Erasmus, Rotterdam after being dialysis dependent since 2016 and experiencing two graft losses

[Link article in Amazing Erasmus from July 7, 2022](#)



Addressable market (annually)
4,000-6,000
split across Europe and the US

Patients that are likely to be transplanted with a compatible donor

Patients unlikely to be transplanted under current prioritization programs

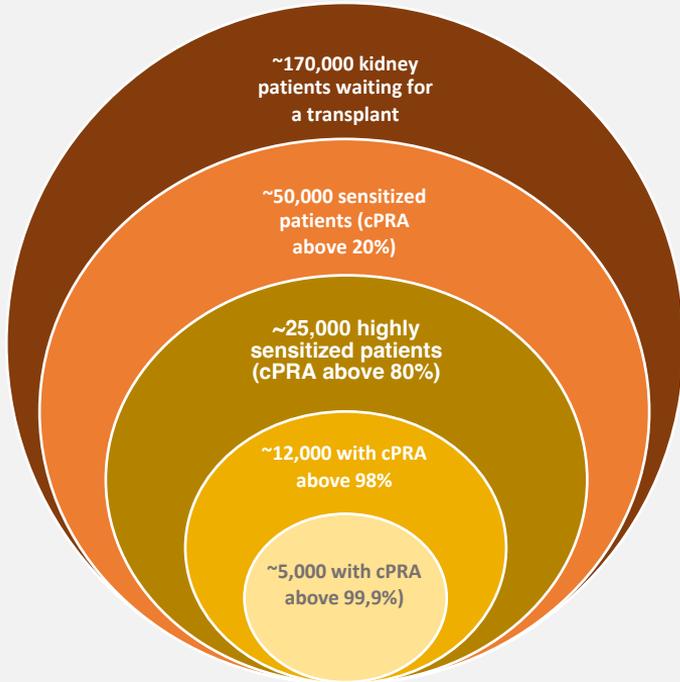


¹ EDQM. (2020). International figures on donation and Transplantation 2019
² SRTR Database and individual assessments of allocation systems

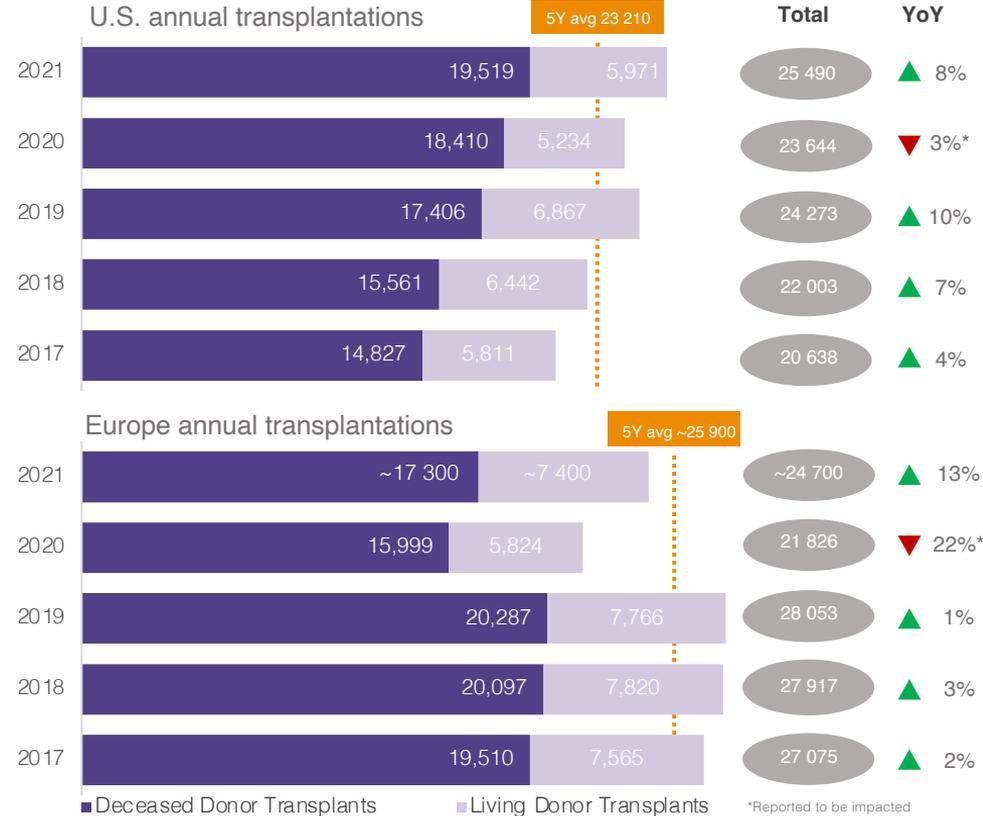
The kidney transplantation landscape in Europe and the U.S.

Up to 15% of patients waiting for a new kidney are highly sensitized

Breakdown of the kidney transplant waitlist in U.S. and EU



~50,000 transplants done annually in the U.S. and Europe



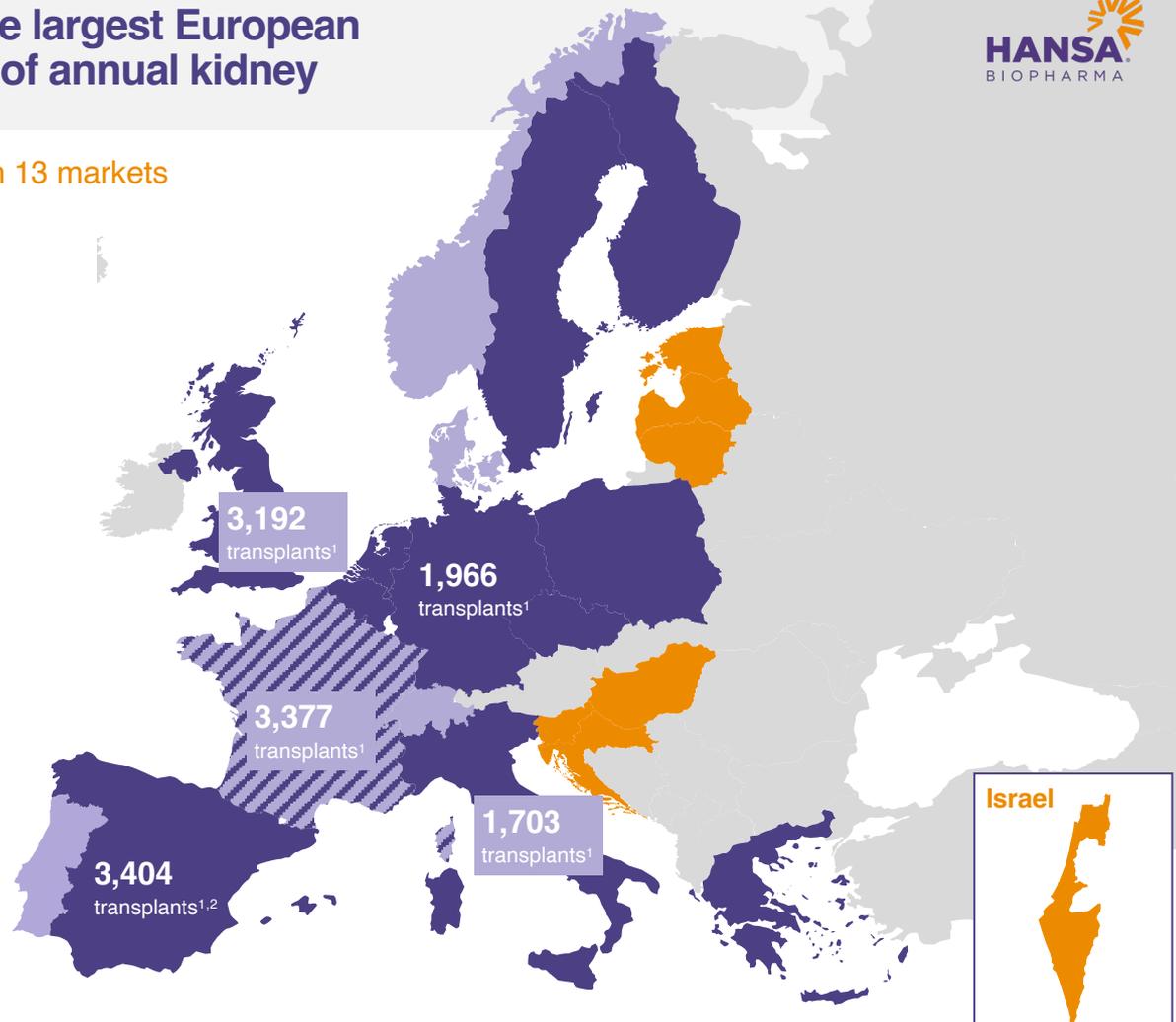
*Reported to be impacted by the COVID-19 pandemic

Source: Global Observatory on Donation and Transplantation, <http://www.transplant-observatory.org/>

Market Access secured in the five largest European markets representing two thirds of annual kidney transplants in Europe

Positive reimbursement decisions received in 13 markets

- Health Technology Assessments (HTA) dossiers submitted
- Reimbursed Early Access Program
- Pricing & reimbursement obtained (country or clinic level)
- Territories covered commercially by Medison Pharma



¹ Annual kidney transplantations 2022. Transplantation data is from Global Observatory on Donation and Transplantation. <https://www.transplantobservatory.org/> [Accessed 2023-07-10]

² A positive recommendation for pricing and reimbursement of Idefix® in Spain was published on February 6, 2023. https://www.sanidad.gob.es/profesionales/farmacologia/pdf/20230202_ACUERDOS_CIPM_230.pdf

Scaling Idefix[®] globally as we transform the desensitization treatment landscape and advance a new way of transplanting patients

1 Build the foundation for Idefix[®]

- ✓ Commercialize in early-launch countries
- ✓ Secure Market Access in key markets
- ✓ Ensure clinical readiness/KOL engagement
- ✓ Implement medical guidelines (ESOT and country specific guidelines)
- ✓ Increase awareness on unmet need
- ✓ Initiate post approval study in Europe
- ✓ Support patient and organ access

2 Expanding internationally

- Leverage experience to scale Idefix in Europe
- Secure FDA approval and launch in the U.S.
- Geographical expansion beyond core markets
- Full marketing authorization in Europe

3 Potential label expansion

- Potentially expand into living donor transplantation
- Potentially expand into other solid organs

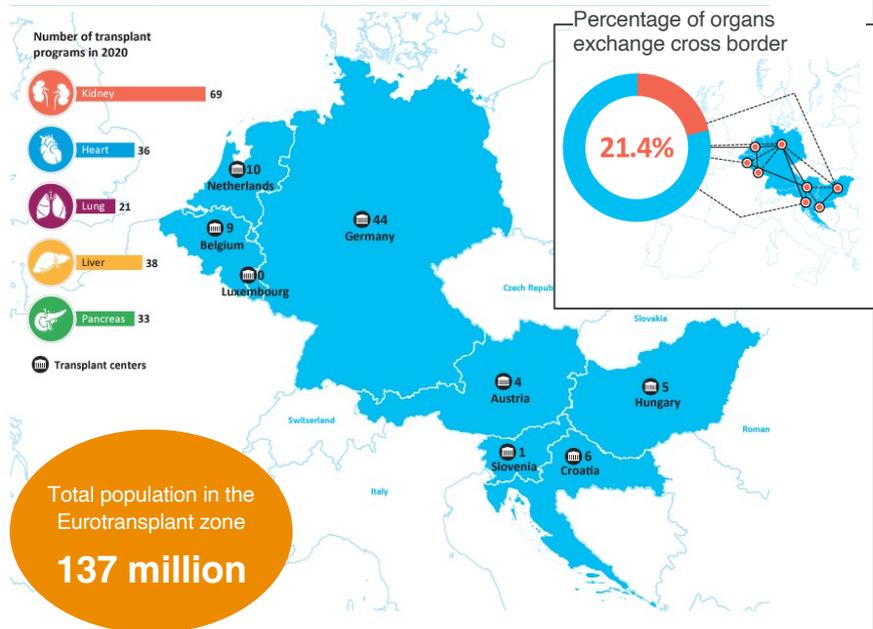
Key activity matrix

Commercial sales uptake



Eurotransplant has recently initiated a new desensitization program for imlifidase-eligible patients

The Eurotransplant zone covers eight countries



Eurotransplant and the Eurotransplant network

- Eurotransplant is an international non-profit organization, that acts as a mediator between donor hospitals and transplant centers between its member states
- Eurotransplant is responsible for the allocation of donor organs in Austria, Belgium, Croatia, Germany, Hungary, Luxembourg, the Netherlands and Slovenia
- The Eurotransplant network has facilitated organ allocation (deceased) and cross-border exchanges for more than 50 years
- The network has one common aim: *"Ensure best possible match"*
- Today patients with a high level of donor specific antibodies are eligible for a special priority list "Acceptable Mismatch" program
- Within the Acceptable Mismatch program, a new desensitization program is established for an imlifidase-tier of patients (June '23)



Eurotransplant pilot program set to transform desensitization and increase clinical experience with imlifidase

Acceptable Mismatch Priority Program

CURRENT

Acceptable Mismatch (AM) Program

Allocates organs to patients who are immunologically compromised because of current and/or historic HLA-sensitization

20 patients to be included in the Pilot program in rounds of five

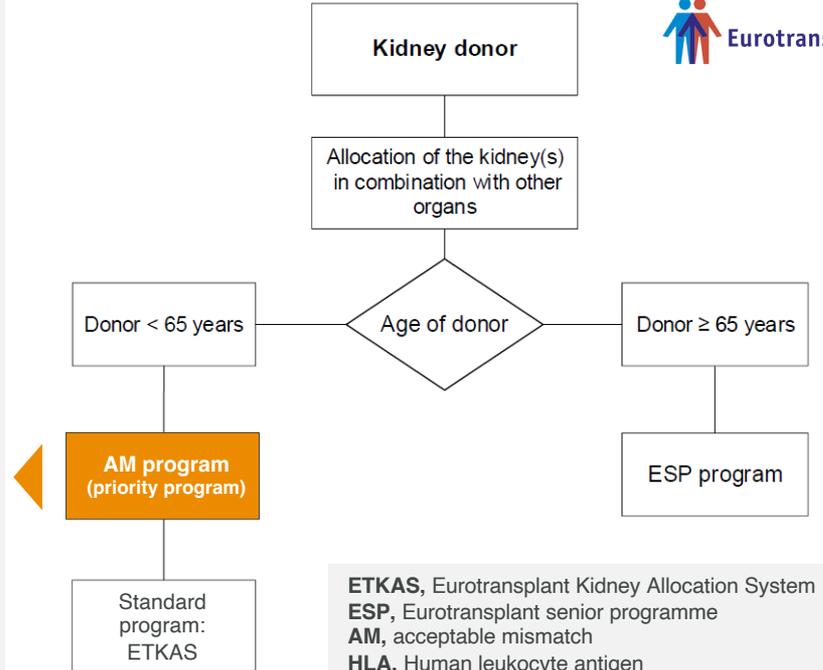
NEW PILOT

Eurotransplant Desensitization Program

Imlifidase-eligible patients who are incompatible to a deceased donor

Inclusion criteria for new program

- No age limitation for patients
- Donor below 65 years
- A minimal waiting time of 3 years in the AM program
- Final transplant center CDC crossmatch must be negative.
- Informed consent form for a follow-up data



Highly sensitized patients are difficult to match with an available kidney

Transplantation leads to better outcomes, saves lives and increase quality of life for patients

Causes of sensitization include:



Pregnancy



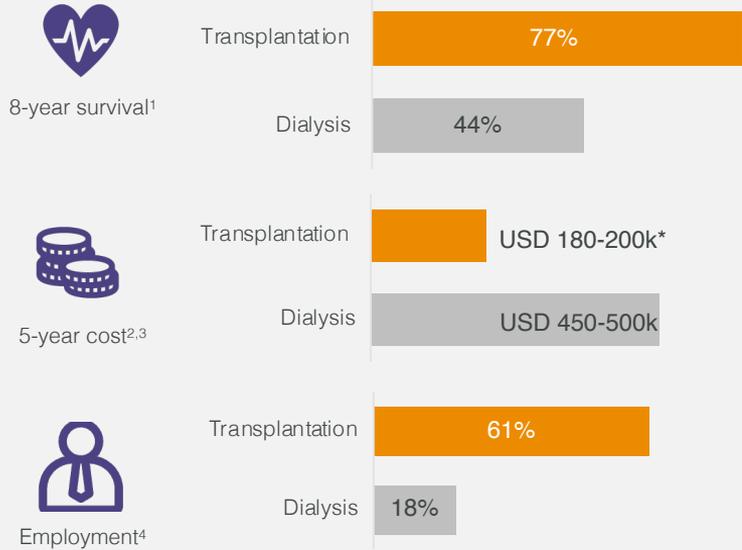
Blood transfusion



Previous transplantations

- Calculated Panel Reactive Antibodies (cPRA) is a measure for HLA-sensitization
- Inability to match or effectively desensitize patients remains a barrier for transplantation in highly sensitized patients
- Allocation Systems such as KAS and Eurotransplant rely on cPRA score to characterize patients for transplant

Better outcomes with transplantation



¹ Orandi et al. N Engl J Med 2016;374:940-50

² www.usrds.org

³ Shehata et al. Transfus Med Rev 2011, 24 Suppl 1: S7-S27

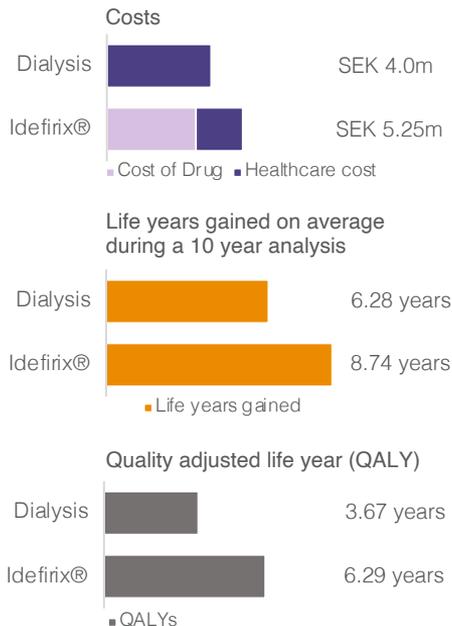
⁴ Jarl et al. Transplantation, 2018, 102:1375-1381

*Cost of kidney transplantation and 5 years of immuno-suppression treatment^{6,7}

First HTA report (TLV) published in Sweden favourable to the use of Idefirix® in highly sensitized patients incompatible to a deceased donor

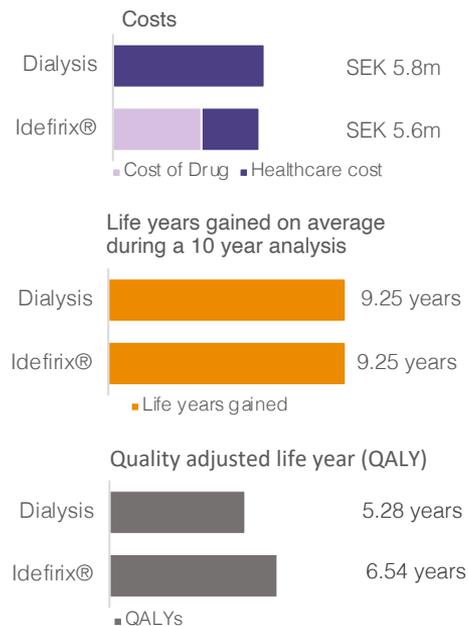
Two cost-effectiveness scenarios presented – both within the accepted threshold for costs related to new drugs
 One scenario even concluding Idefirix treatment would lead to an overall cost saving – rare for orphan drugs

Scenario 1
High dialysis mortality



Costs per quality adjusted life year (QALY)
 SEK 460k (EUR 45k)

Scenario 2
Low dialysis mortality



Scenario 2 supports Idefirix® as a cost saving drug

Costs per quality adjusted life year (QALY)
 SEK -170k (EUR -17k)

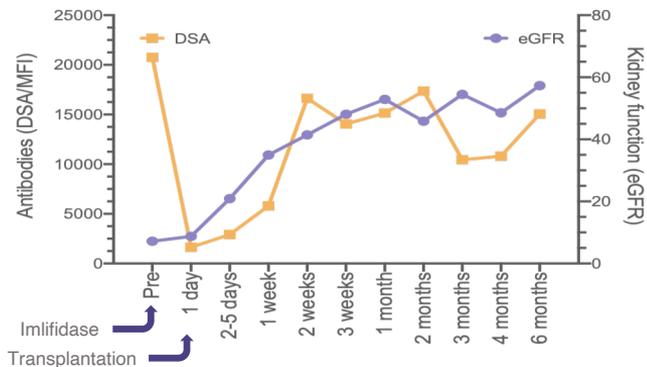
Completed and ongoing studies in kidney transplantation



Imlifidase enabled kidney transplantation in 46 highly sensitized patients during clinical trials

Pooled analysis from four Phase 2 trials

- Analysis included 46 patients
 - 50% had a cPRA of 100% (Average 99%)
 - 85% were crossmatch positive
 - 70% were retransplanted
- Donor Specific Antibody (DSA) levels rapidly decreased and all crossmatches were converted to negative, thus enabling transplantation in all patients
- At study completion, all patients alive and graft survival at 94% six months post transplantation
- 5 year follow-up data expected in 2023



Study design of our four Phase 2 trials leading to the approval in EU

- | | | |
|---------------------|-----------------------|---|
| Study 02
Phase 2 | Subjects | 8 patients |
| | Design | Single-center, single-arm, open-label |
| | Main objective | Efficacy defined as Imlifidase dosing scheme resulting in HLA antibody levels acceptable for transplantation, within 24 hours |
| Study 03
Phase 2 | Subjects | 10 patients |
| | Design | Single-center, single-arm, open-label, no prior desensitization |
| | Main objective | Safety in the transplantation setting and efficacy defined as HLA antibody levels acceptable for transplantation |
| Study 04
Phase 2 | Subjects | 17 patients |
| | Design | Investigator initiated, single-center, single-arm, open-label. All patients had prior desensitization with IVIG and/or PLEX |
| | Main objective | Safety in combination with Cedars Sinai's "standard protocol" for desensitization of highly sensitized patient |
| Study 06
Phase 2 | Subjects | 18 patients |
| | Design | Multicenter, multinational, single-arm, open-label |
| | Main objective | Efficacy in creating a negative crossmatch test |

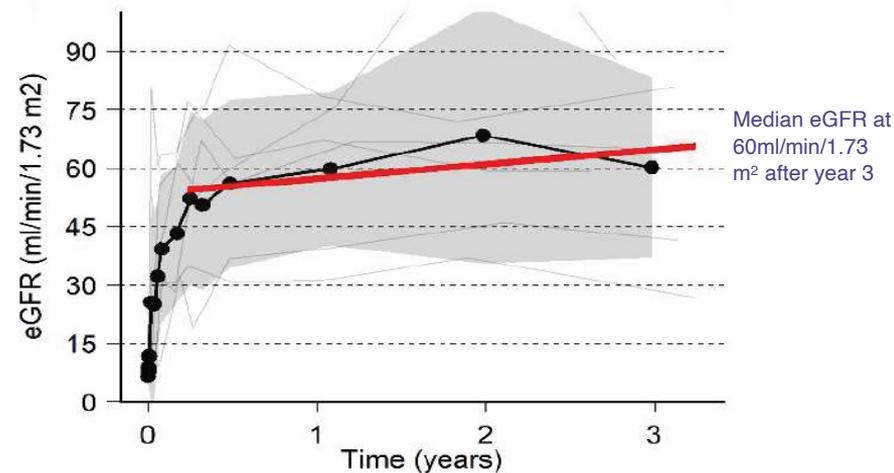
3-year follow up demonstrate graft survival of 84% after imlifidase treatment and transplantation

Data accepted for publication in the American Journal of Transplantation¹ [Link AJT article](#)
30 patients participating in follow-up study at year three

AMR frequency in line with other desensitization protocols

- Three-year follow-up data shows graft survival of 84% after imlifidase treatment and transplantation and a mean eGFR of 55 mL/min/1.73 m² (61 ml/min/m² for those without AMR)
- For a subgroup of patients (n=13) with cPRA of $\geq 99.9\%$ graft survival was 92% and improved kidney function for patients with a mean eGFR at 60ml/min/1.73 m² after year three
- 38% of the patients experienced active antibody mediated rejection episodes (AMR) within the first six months, which compares with 25-60% of patients in the literature for highly sensitized patients²
- Only two AMR episodes were reported beyond the first 6 months. All AMRs were treated with standard therapies and no graft losses were attributed to AMR
- Patient survival 90% (three deaths unrelated to imlifidase)
- Long-term safety profile indicates no increase in the rates of infection or malignancy
- Next milestone expected in H2 2023 on the 5-year follow-up data

Improved kidney function for patients with cPRA $\geq 99.9\%$



Potential to disrupt transplantation care in the U.S. with imlifidase

Complex allocation system with limited clinical innovation

25,000 annual kidney transplants

71% diseased donors

~90,000 patients on the waitlist

10-15% of waitlisted patients are highly sensitized

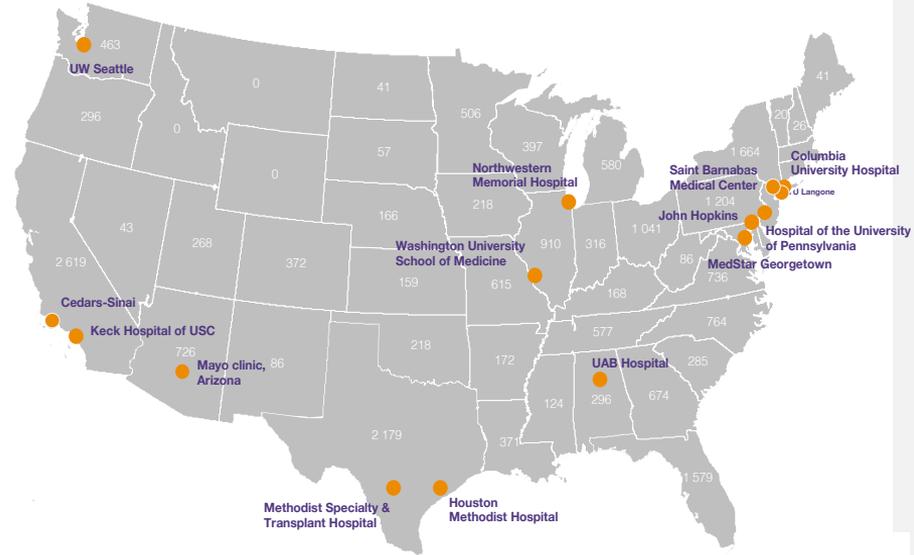
~6,000 highly sensitized patients with cPRA of 98% or above
(hereof ~2,500 with cPRA of 99.9% and above)

U.S. ConfideS

Phase 3

- 76 patients screened and enrolled
- Plans to expand no of sites from currently 14 to 20 or more to accelerate randomization
- Randomization expected to be completed H2 2023, as previously guided

ConfideS phase 3 trial will further advance potential for imlifidase to address unmet need in desensitization

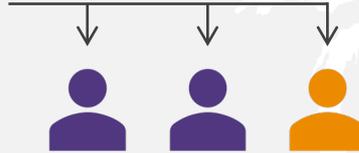


Imlifidase may complement the US Kidney Allocation System, as thousands of patients are still unlikely to find a match

- Factors impacting the KAS score¹**
- Waiting time
 - Age
 - Transplantation history
 - Sensitization (cPRA score)
 - Distance and recipient
 - Quality of donor kidney (KDPI)

KAS gives patients points with regards to levels of sensitization, increasing the likelihood of finding a match for sensitized patients

Transplantation of highly sensitized patients has increased since the introduction of KAS. However, thousands of patients are still unlikely to find a match



Highly sensitized patients are less likely to find a matching organ from a deceased donor through KAS

Degree of sensitization		cPRA%	Est. no. of organs to find match ²	Estimated number of patients on waitlist (U.S) ³
		Less or moderate	0-20	1-2
Highly sensitized	20-80	2-14	~16,000	
	80-98	14-300	~5,000	
	98-99.9	300-3,000	~3,500	
	>99.9	3,000-300,000	~2,500	

KAS was revised in the U.S. in 2014 to increase equity of transplantation. However, thousands of highly sensitized patients are still not treated



If approved, Idefix[®] may address highly sensitized kidney transplant patients, who are incompatible to a deceased donor in the US Kidney Allocation System

¹ OPTN, https://optn.transplant.hrsa.gov/media/1200/optn_policies.pdf

² p=95%, Clinical Journal of the American Society of Nephrology, 2016

³ Company estimates, OPTN and Global Observatory on Donation and Transplantation

U.S. ConfideS study: Randomized controlled study in 64 highly sensitized patients with highest unmet medical need

U.S. trial design

64 highly sensitized kidney patients with the highest unmet medical need

- Patients with a cPRA score of $\geq 99.9\%$ will be enrolled
- First patients enrolled at Columbia University, NYC
- 76 patients enrolled across fourteen sites as of July 20, 2023
- 1:1 Randomization
- When a donor organ becomes available and a positive crossmatch with the intended recipient indicates that the organ is not compatible, the patient will be randomized to either imlifidase or to a control arm, where patients either remain waitlisted for a match or receive experimental desensitization treatment*

Primary endpoint

- Mean estimated glomerular filtration rate (eGFR) “kidney function” at 12 months.
- For randomized patients who do not undergo transplantation, lose their graft or die before 12 months, eGFR will be set to zero, consistent with kidney failure

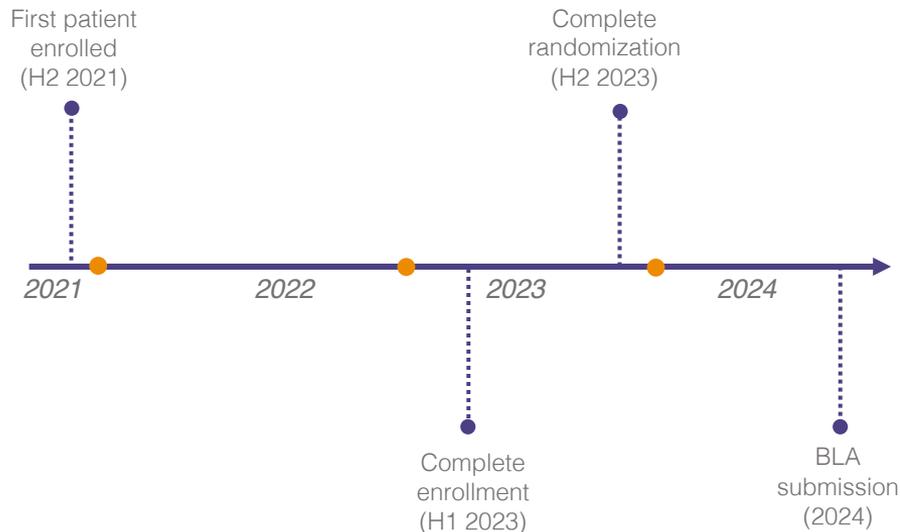
Secondary endpoint

- Patient survival at 12 months

Up to 20 leading transplantation centers in the U.S. will be engaged in the study

- Robert A. Montgomery, M.D. Professor of Surgery and Director, NYU Langone Transplant Institute, NYC is appointed to be the principal investigator

Timeline



*Experimental desensitization treatment can include any combination of plasma exchange (PLEX), intravenous IVIg, anti-CD20 antibody, and eculizumab. Link to the full protocol at [ClinicalTrials.gov](https://clinicaltrials.gov)

First patient treated in post-authorization efficacy study (PAES) of Idefirix® (imlifidase) in highly sensitized kidney transplant patients

The study will provide further important insights regarding Idefirix® desensitization treatment of highly sensitized kidney transplant patients

An open-label Phase 3 study in 50 patients

- First patient was treated by Dr. Oriol Bestard, Chair of Nephrology and Kidney Transplantation at Vall d'Hebron University Hospital in Barcelona
- Study will enroll 50 highly sensitized patients with positive crossmatch against an available deceased donor across multiple countries and centers in Europe
- The study is an obligation under the conditional marketing authorization for Idefirix® granted by EMA in August 2020, in order to complete a full marketing authorization in the EU. Study is expected to be complete in 2025
- The aim will be to confirm the long-term efficacy and safety of Idefirix® with the primary objective to determine the one-year graft failure-free survival of the Idefirix® treated and transplanted patients.
- In addition, a total of 50-100 patients undergoing compatible kidney transplantation at the participating centers will be included and serve as a non-comparative concurrent reference cohort, with no formal comparison, to contextualize the one-year graft failure-free survival of the Idefirix® treated patients



Study to assess imlifidase in combination to optimize patient outcome

in highly sensitized patients with donor specific antibodies (DSA) rebound and antibody mediated kidney transplant rejection

Trial design (ClinicalTrials.gov ID: NCT05049850)

The study is designed to assess if imlifidase in combination with bortezomib¹, belatacept², rituximab³ and IVIg⁴ can suppress donor specific antibodies (DSA) and the occurrence of antibody-mediated rejection (AMR) in transplant patients with a positive crossmatch towards their living donor.

Open label, single arm study

- Imlifidase is administered within the 24-hour prior to a living donor transplantation

Primary endpoint

- Proportion of patients with DSA rebound (up to 3 months after transplantation)
- Rebound of DSA may cause AMR and is thus a risk for graft loss

Secondary endpoint

- Proportion of patients with AMR (up to 6 months after transplantation)

The study will be run at the NYU Langone Transplant Institute and was commenced end of 2022

¹ bortezomib, a proteasome inhibitor which has activity against mature plasma cells, the source of DSA

² belatacept, a fusion protein which is crucial in blocking T-cell co-stimulation and which is effective in reducing de novo DSA generation in humans

³ rituximab, an anti-CD20 monoclonal antibody that targets B-cells and which is an immunomodulatory agent

⁴ intravenous immunoglobulin (IVIg) which is commonly used in desensitization regimens and for the treatment of AMR

Link to the full protocol at [ClinicalTrials.gov](https://clinicaltrials.gov)



Study 01 Phase 1

The 01 study results

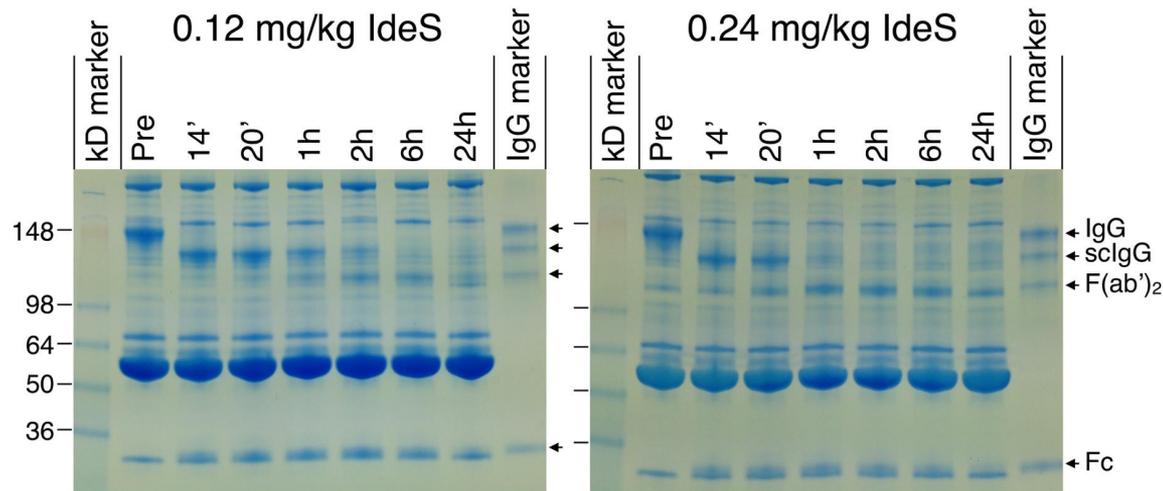
Data showed complete removal of IgG and a good tolerability profile

Efficacy

- ✓ Rapid degradation of IgG in serum in subjects dosed with 0.12 and 0.24 mg/kg imlifidase. Imlifidase had full effect within 6 hours. The entire IgG pool was converted into F(ab')₂ and Fc-fragments. Maximal effect was accomplished 2-6 hours after dosing.

Safety

- ✓ Newly synthesized intact IgG was clearly detectable in all subjects after 1-2 weeks after dosing. After 3 weeks the level of intact IgG constituted the main IgG fraction in serum



CLINICALTRIALS.GOV ID

NCT01802697 (2013/2014)

SUBJECTS

29 (20 active plus 9 placebo) healthy subjects (Sweden)

DOSES/FOLLOW UP TIME

The starting dose was 0.01 mg/kg BW and the highest dose group received 0.24 mg/kg BW

MAIN OBJECTIVES

- The objectives were to assess safety, efficacy in IgG cleavage, pharmacokinetics and immunogenicity of imlifidase following intravenous administration

STUDY DESIGN

- Randomized placebo-controlled dose-escalation study with 29 (20 active plus 9 placebo) healthy subjects

STATUS

Completed

- The 01 study showed that Imlifidase was considered safe to use

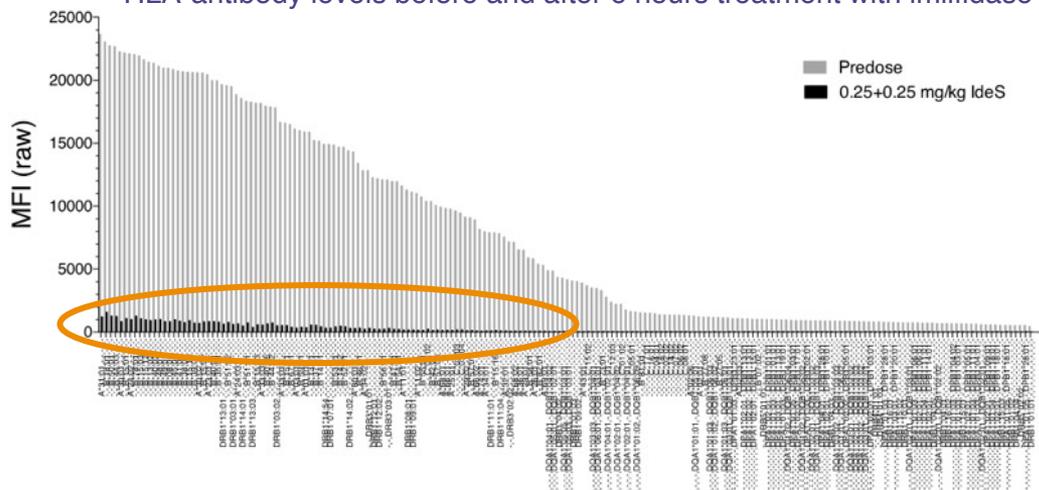
Study 02 Phase 2

The 02 study results

Data showed that 1-2 doses of imlifidase at 0.25 mg/kg BW resulted in HLA antibody levels acceptable for transplantation¹

- ✓ Imlifidase is well tolerated in patients with chronic kidney disease
- ✓ Efficacy results strongly support further development in the patient population
- ✓ The first HLA-incompatible transplantation ever after desensitization with imlifidase was performed in one of these patients (2014)

HLA-antibody levels before and after 6 hours treatment with imlifidase



¹ Lorant et al (2018) American Journal of Transplantation (2018)

Study 03 Phase 2

The 03 study proved safety and efficacy

HLA antibodies at acceptable levels; enabling transplantation in all patients

CLINICALTRIALS.GOV ID

NCT02475551

SUBJECTS

10 Patients (Sweden)

DOSES/FOLLOW UP TIME

0.25 and 0.50 mg/kg during 180 days

MAIN OBJECTIVES

- Safety in the transplantation setting
- Efficacy defined as HLA antibody levels acceptable for transplantation

STUDY DESIGN

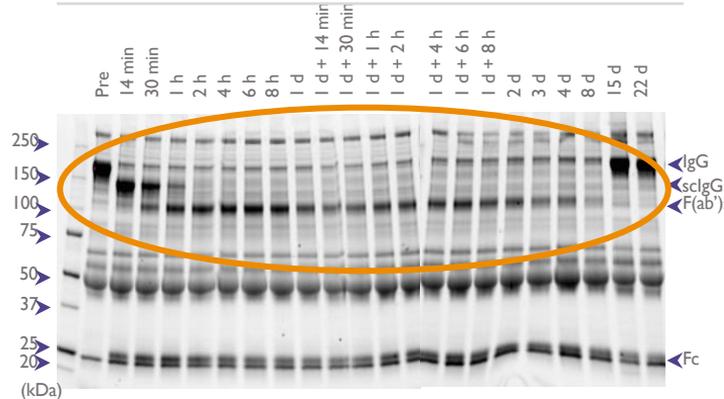
- Single-center, single-arm, open-label, no prior desensitization
- Similar design as 13-HMedIdeS-02 but transplantation part of protocol
- In deceased and living donors

STATUS

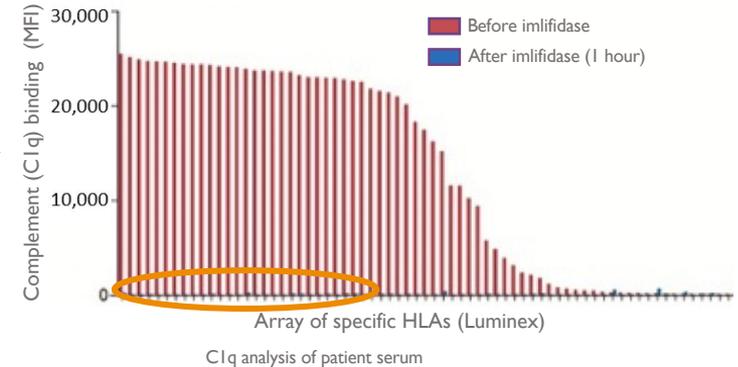
Completed

- Proved safety and efficacy with HLA antibodies at acceptable levels; enabling transplantation in all patients

Analysis of IgG in patient serum before and after imlifidase treatment



Analysis of complement binding HLA antibodies before and after imlifidase



Protocol

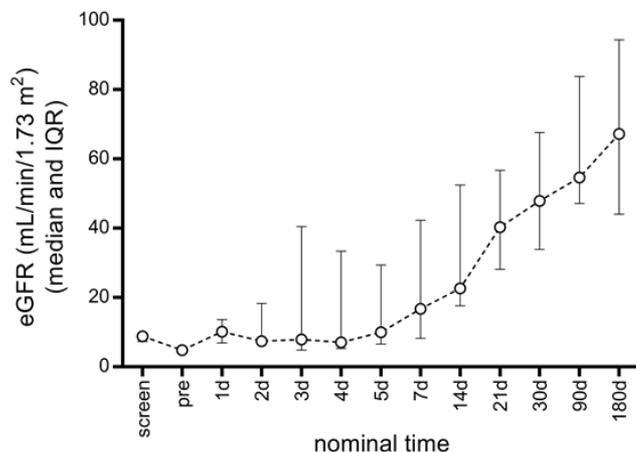


Study 04 Phase 2

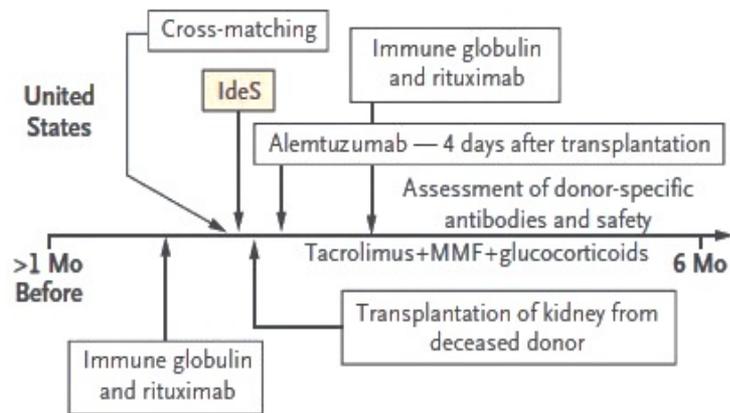
The 04 study results

Study proved safety and efficacy with Cedar Sinai's standard protocol (rituximab and IVIg)

Graft function (eGFR) post six months



Cedar's desensitization protocol in combination with imlifidase



CLINICALTRIALS.GOV ID

NCT024226684

SUBJECTS

17 Patients (US)

DOSES/FOLLOW UP TIME

0.24 mg/kg 180 days

MAIN OBJECTIVES

- Safety in combination with Cedars Sinai's "standard protocol" for desensitization of highly sensitized patients
- Efficacy in preventing AMR

STUDY DESIGN

- Investigator initiated study
- Investigator sponsored IND
- Imlifidase to desensitize patients previously treated with rituximab and IVIg
- Deceased donors only

STATUS

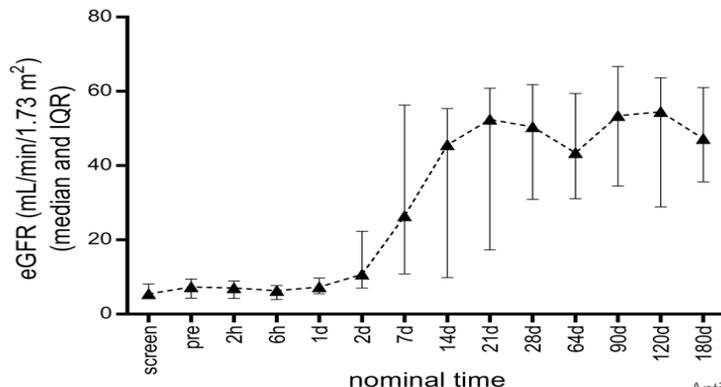
Completed

Study 06 Phase 2

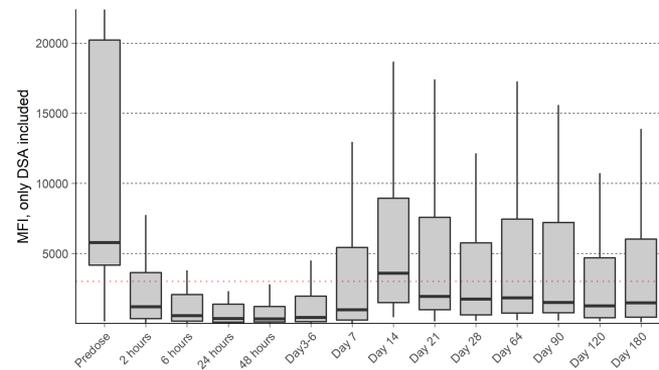
The 06 study results

Study showed proved safety and efficacy in making highly sensitized patients eligible for kidney transplantation

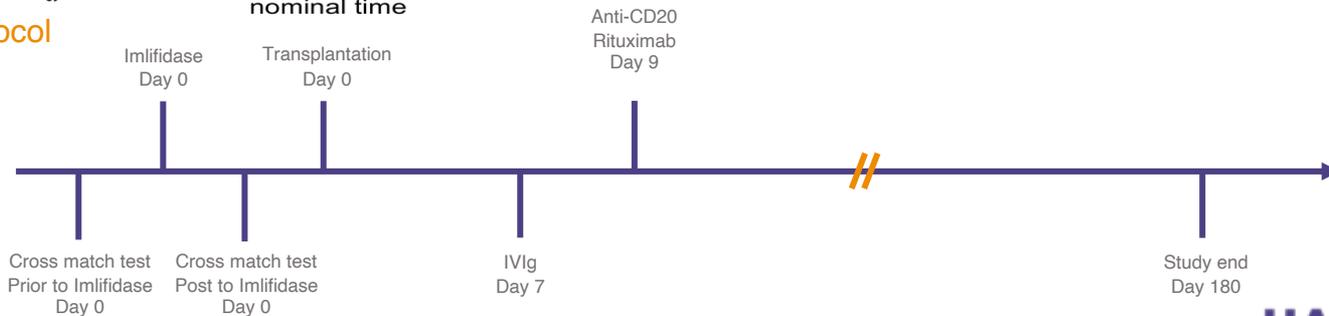
Graft function (eGFR) post imlifidase



DSA level pre-dose and post imlifidase



Protocol



CLINICALTRIALS.GOV ID

NCT02790437

SUBJECTS

18 Patients (US+Sweden+France)
19 safety set, 18 efficacy set

DOSES/FOLLOW UP TIME

0.25 mg/kg 180 days

MAIN OBJECTIVES

- Efficacy in creating a negative crossmatch test

STUDY DESIGN

- Multicenter, multinational, single-arm, open-label Included patients who may have had prior unsuccessful desensitization or patients in whom it was unlikely to be effective

STATUS

Completed

Completed studies with imlifidase in transplantation

STUDY	SUBJECTS/ COUNTRY	STUDY DESIGN	PRIMARY ENDPOINT	SECONDARY ENDPOINTS	STATUS/ PUBLICATION
Study 01 Phase 1	29 subjects 	<ul style="list-style-type: none"> Randomized placebo-controlled dose-escalation study with 29 (20 active plus 9 placebo) healthy subjects 	<ul style="list-style-type: none"> Safety and tolerability 	<ul style="list-style-type: none"> Efficacy in IgG cleavage, the pharmacokinetics (PK) and immunogenicity of imlifidase 	Complete PLOS ONE (2015) ¹
Study 02 Phase 2	8 subjects 	<ul style="list-style-type: none"> Single-center, single-arm, open-label 	<ul style="list-style-type: none"> Dosing resulting in HLA-antibody reduction (MFI<1100) 	<ul style="list-style-type: none"> Efficacy: HLA antibody reduction acceptable for transplantation (MFI <1100 as measured in SAB assay) 	Complete Lorant et al (2018) American Journal of Transplantation ²
Study 03 Phase 2	10 subjects 	<ul style="list-style-type: none"> Single-center, single-arm, open-label No prior desensitization 	<ul style="list-style-type: none"> Safety: AEs, clinical laboratory tests, vital signs, ECGs 	<ul style="list-style-type: none"> Efficacy: HLA antibody reduction acceptable for transplantation (MFI <1100 as measured in SAB assay) 	Complete The New England Journal of Medicine (2017) ³
Study 04 Phase 2	17 subjects 	<ul style="list-style-type: none"> Investigator initiated study, Single-center, single-arm, open-label All patients had prior desensitization with IVIG and/or plasmapheresis 	<ul style="list-style-type: none"> Assessment of efficacy in eliminating DSAs in DSA and flow cytometry positive, highly sensitized patients Assessment of safety Assessment of efficacy/kidney function 	<ul style="list-style-type: none"> Serum creatinine (0-6 months) Proteinuria (0-6 months) DSA at multiple timepoints posttransplant (day 0, D30, D90, D180) 	Complete The New England Journal of Medicine (2017) ³
Study 06 "Highdes" Phase 2	18 subjects 	<ul style="list-style-type: none"> Multicenter, multinational, single-arm, open-label Included pts who may have had prior unsuccessful desensitization or pts in whom it was unlikely to be effective 	<ul style="list-style-type: none"> Crossmatch conversion in DSA+ patients who have a positive XM test to their available LD or DD 	<ul style="list-style-type: none"> DSA reduction at multiple timepoints (2, 6, 24, 48 h after imlifidase) Time to create negative CDC XM test and/or flow cytometry (FACS) XM test Safety 	Complete Annals of Surgery (Lonze et al, only New York patients) Montgomery et al ATC abstract (2019) ⁴
Long-term follow-up study	Up to 46 subjects 	<ul style="list-style-type: none"> A prospective, observational long-term follow-up study of patients treated with imlifidase prior to kidney transplantation 	<ul style="list-style-type: none"> Long-term graft survival in patients who have undergone kidney transplantation after imlifidase administration 	<ul style="list-style-type: none"> Patient survival, kidney function, comorbidity, treatments and QoL Safety DSA Immunogenicity 	Ongoing 5 year long-term data read-out (2023)

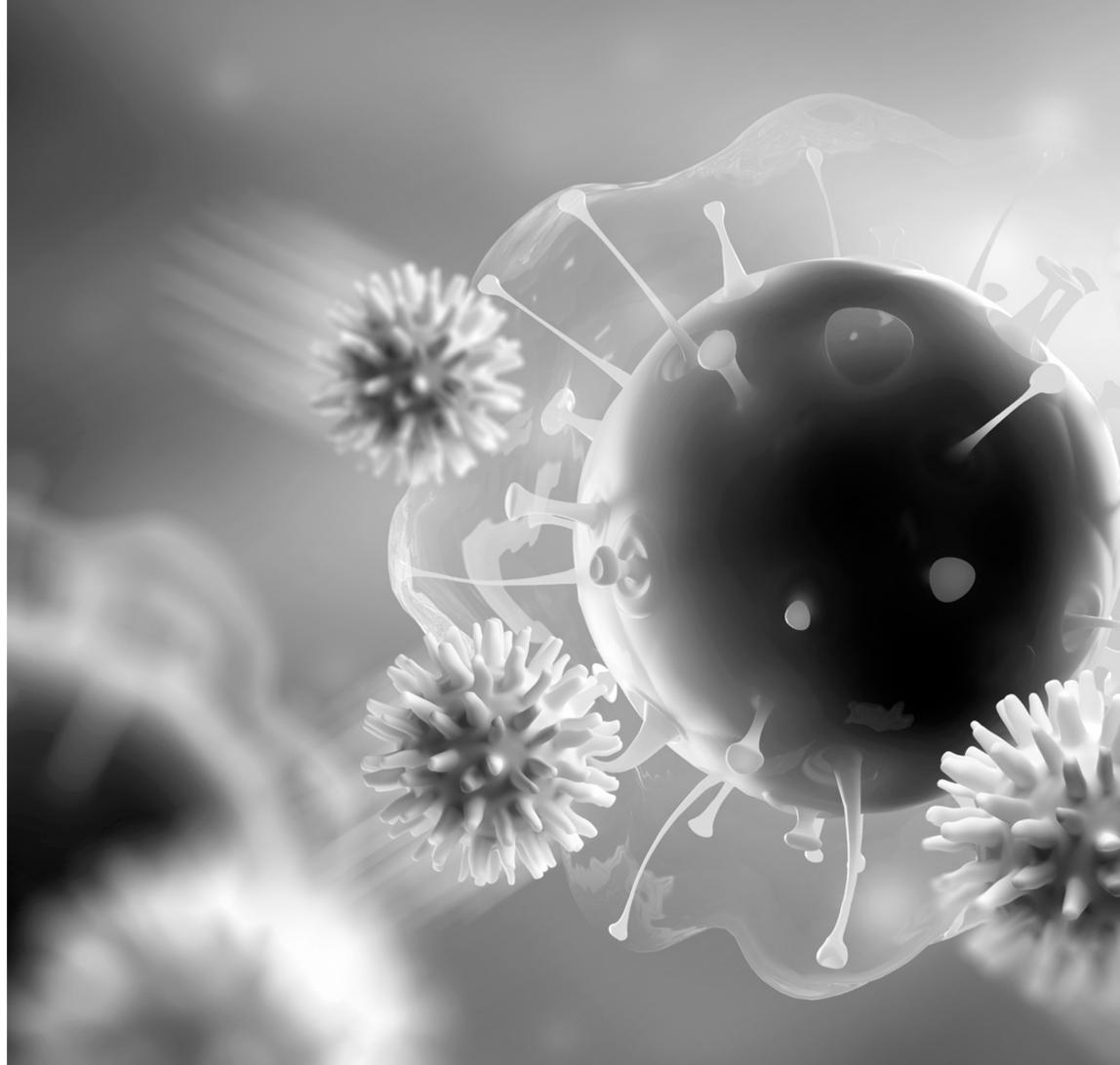
¹ Winstedt et al., "Complete Removal of Extracellular IgG Antibodies in a Randomized Dose Escalation Phase I Study with the Bacterial Enzyme IdeS – A Novel Therapeutic Opportunity", PLOS ONE 2015, 10(7)

² Lorant et al., "Safety, immunogenicity, pharmacokinetics and efficacy of degradation of anti-HLA antibodies by IdeS (imlifidase) in chronic kidney disease patients" Am J Transplant. 2018 Nov;18(11):2752-2762

³ Jordan et al., "IgG Endopeptidase in Highly Sensitized Patients Undergoing Transplantation", N Engl J Med 2017;377:442-53.

⁴ Montgomery et al., "Safety And Efficacy Of Imlifidase In Highly-sensitized Kidney Transplant Patients: Results From A Phase 2 Study" ATC Abstract, 2019

Our antibody cleaving enzyme technology



Broad clinical pipeline in transplantation and autoimmune diseases

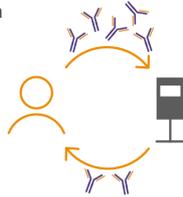
Candidate/ Project	Indication	Research/ Preclinical	Phase 1	Phase 2	Phase 3	Marketing Authorization	Marketed	Next Anticipated Milestone
Imlifidase	EU: Kidney transplantation in highly sensitized patients ^{1,2}	Completed	Completed	Completed	Planned	Completed	Ongoing	EU: Additional agreements around reimbursement / Post approval study to be completed by 2025
	US: Kidney transplantation in highly sensitized patients ^{1,2}	Completed	Completed	Completed	Ongoing			Completion of randomization (64 patients) H2 2023
	Anti-GBM antibody disease ³	Completed	Completed	Completed	Ongoing			Complete enrollment (50 patients)
	Antibody mediated rejection in kidney transplantation (AMR)	Completed	Completed	Ongoing				Full data read out H2 2023
	Guillain-Barré syndrome (GBS)	Completed	Completed	Ongoing				Topline data H2 2023 / Comparative efficacy analysis 2024
	ANCA-associated vasculitis ⁴	Completed	Completed	Ongoing				Complete enrollment (10 patients)
	Pre-treatment ahead of gene therapy in Duchenne (Partnered with Sarepta)	Ongoing	Planned					Initiate clinical study of imlifidase as pre-treatment in DMD 2023
	Pre-treatment ahead of gene therapy in Limb-Girdle (Partnered with Sarepta)	Ongoing						Preclinical research
	Pre-treatment ahead of gene therapy in Pompe disease (Partnered with AskBio)	Ongoing						Preclinical research
	Pre-treatment ahead of gene therapy in Crigler-Najjar syndrome (Partnered with Genethon)	Ongoing						Preclinical research
HNSA-5487	Lead molecule from second-generation IgG antibody cleaving enzymes (NiceR)	Completed	Ongoing					Completion of phase 1 (H2 2023)

¹ Results from the Phase 1 study have been published, Winstedt et al. (2015) PLOS ONE 10(7)
² Lorant et al., American Journal of Transplantation and 03+04 studies (Jordan et al., New England Journal of Medicine)
³ Investigator-initiated study by Mårten Segelmark, Professor at the universities in Linköping and Lund, Sweden
⁴ Investigator-initiated study by Dr. Adrian Schreiber and Dr. Philipp Enghard, at Charité – Universitätsmedizin Berlin, Germany

Development of IgG-modulating technologies

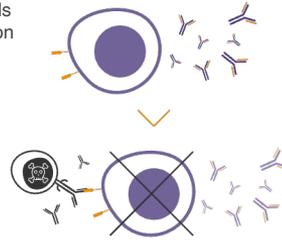
Mechanisms can be both complementary and competing

PLEX, plasmapheresis, immunoadsorption
Mechanically removes antibodies from circulation



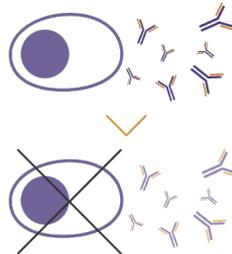
1950s

B-cell depleting mAbs
Lowering antibody levels through B-cell elimination



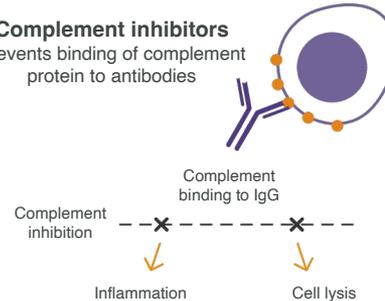
1990s

Proteasome inhibitors
Depletes antibody producing long-lived plasma cells and lowers overall immunoglobulin levels



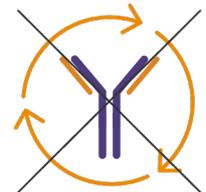
2000s

Complement inhibitors
Prevents binding of complement protein to antibodies



2010s

FcRn-inhibitors
Lowering IgG through blocking of antibody recycling

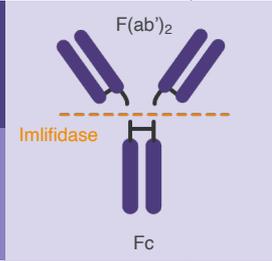


2020s

Imlifidase – IgG-cleaving enzyme

Deactivates IgG within 2-6 hours through enzymatic cleavage. IgG-free window for approximately one week

Unique mechanism-of-action is the basis for competitive advantage vs other IgG-modulating therapies

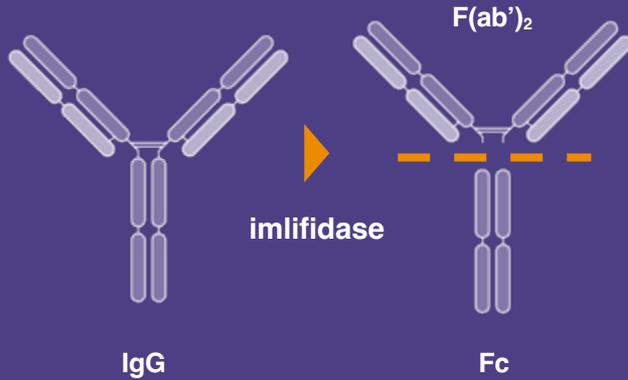


Imlifidase mode of action

Novel approach to effectively eliminate pathogenic IgG

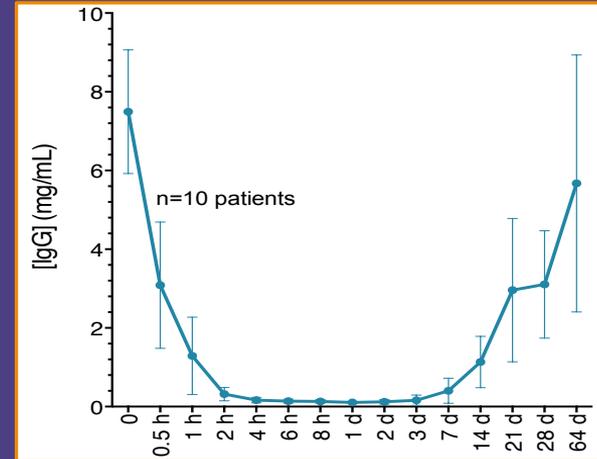
Proven mechanism of action

- Interacts with Fc-part of IgG with extremely high specificity
- Cleaves IgG at the hinge region, generating one F(ab')₂ fragment and one homo-dimeric Fc-fragment



Inactivation of IgG in human serum

- Rapid onset of action that takes down IgG below detectable level in 2-6 hours post 15 min infusion
- IgG antibody-free window for approximately one week



Our unique antibody cleaving enzyme technology may have relevance across a range of indications

Targeting rare IgG mediated diseases



Auto-immune diseases

Anti-GBM paves the way for development in other autoimmune diseases

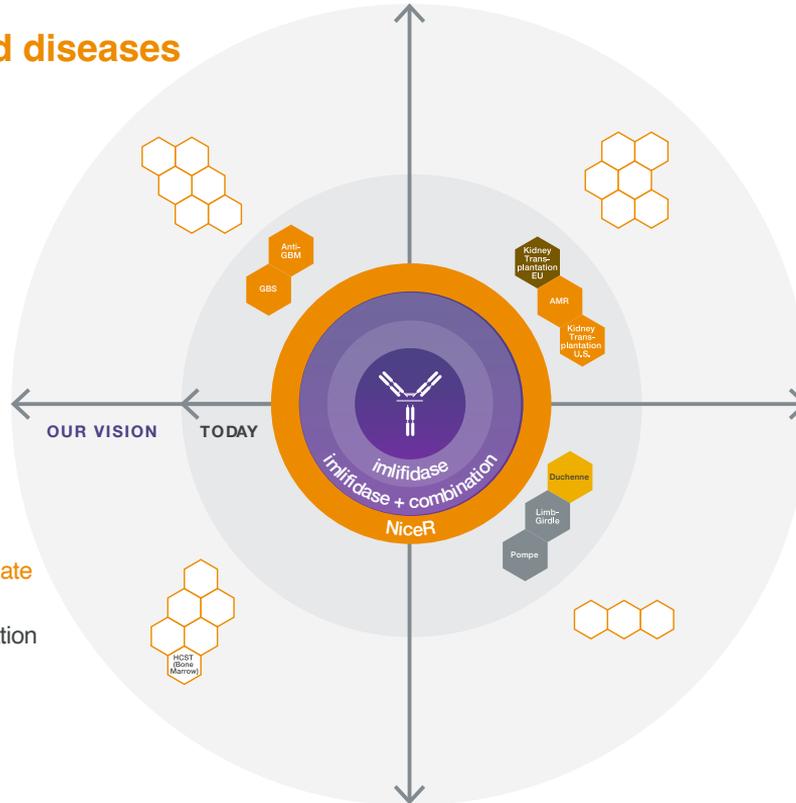
- Rapidly progressive glomerulonephritis
- Neurological disorders
- Skin and blood disorders



New therapies and oncology

IgG-cleaving enzymes to enable or even potentiate cancer therapy

- Allogenic stem cell (bone marrow) transplantation (HSCT)



Transplantation

Shaping a new standard for desensitization will help enable new indications in transplantations

- Antibody mediated rejection (AMR) in kidney transplantation
- Other transplantation types



Gene therapy

Exploring opportunities in gene therapy

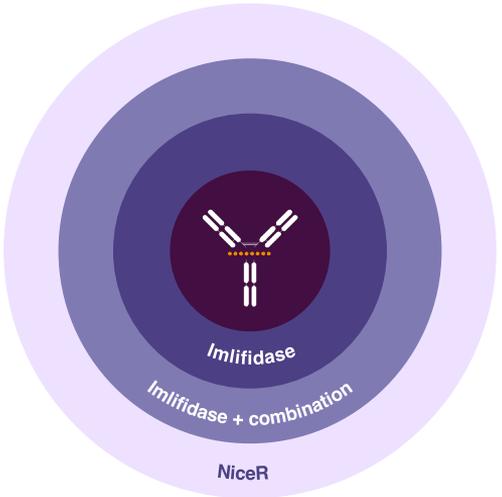
- Encouraging preclinical data published in Nature
- Validation through collaborations with Sarepta and AskBio
- Wide indication landscape beyond

The technology platform is the primary basis for achieving our vision

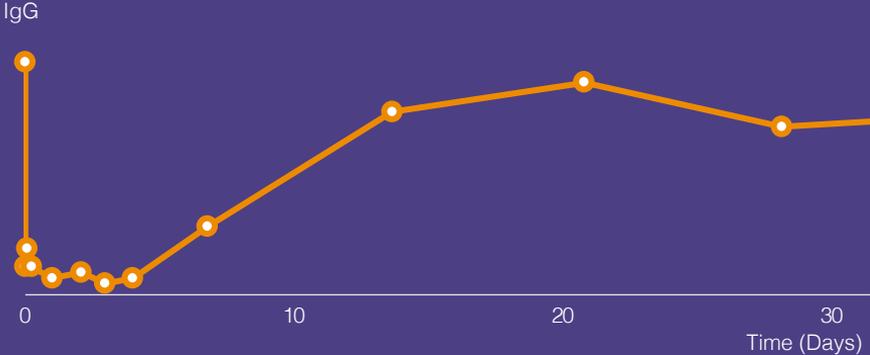
Targeting rare IgG mediated diseases and conditions

Key opportunities:

- Expanding into **new indications**
- Reduce immune response to IgG-cleaving enzyme, i.e. allow **repeated treatment**
- **Combination therapy**, i.e. induction and maintenance therapy



IgG levels after imlifidase treatment in highly sensitized patients – First 30 days



IgG levels after imlifidase treatment in highly sensitized patients – 1 year and beyond

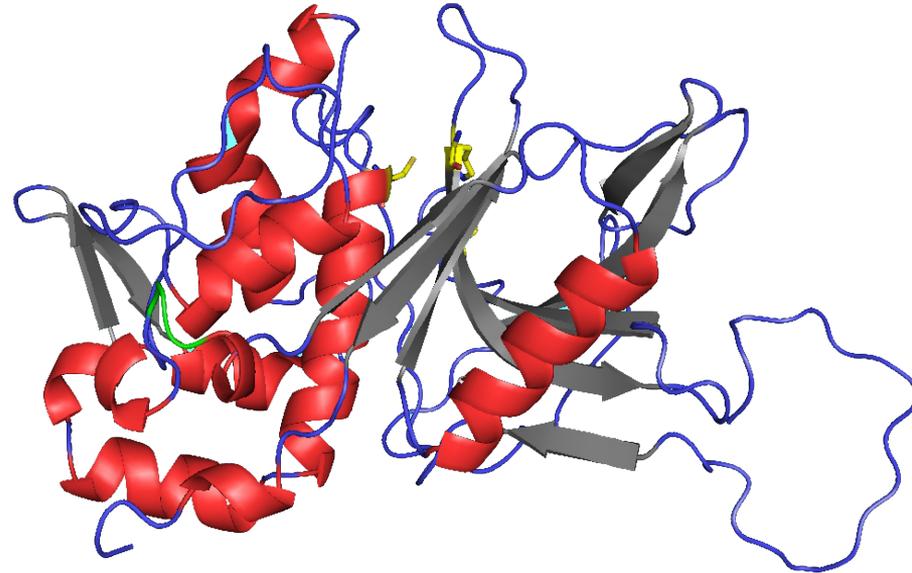


Our IgG antibody-cleaving enzyme, imlifidase

Origins from *Streptococcus pyogenes*

- Cysteine protease derived from an Immunoglobulin G (IgG)-degrading enzyme of *Streptococcus pyogenes*
- Contains only one cysteine - no disulfide bridges
- Monomeric protein with a molecular mass of 35 Kilo Dalton
- Isoelectric point of 6.1
- The coding gene for imlifidase is cloned and expressed in *Escherichia coli*

Imlifidase consists of 311 amino acids



Imlifidase is a lyophilized product formulation

Shelf life of 18 months at 2-8° Celsius storage; Ongoing stability studies indicate a shelf life of at least 24 months.

Imlifidase will be infused in 15 minutes

- The product for commercial supply will be a lyophilized (cold chain) powder concentrate (11 mg solution) for infusion currently with a claimed shelf life of 18 months at 2-8°C storage. Ongoing stability studies indicate a shelf life of at least 24 months.
- Each vial is filled with 1.2 mL of a 10 mg/mL solution before freeze drying (=12 mg). Extractable volume after reconstitution with 1.2 mL sterile water is 1.1 mL of 10 mg/mL solution - resulting in 11 mg product
- The protein concentration, 10 mg/mL, has desirable characteristics with respect to not form aggregates
- Continuous stability programs ongoing to study changes in protein characteristics and performance.
- Imlifidase dose is clinically set to 0.25 mg/kg bodyweight (11 mg / 0.25 mg/kg = 44 kg (BW) / vial content) 2R vial size is suitable for the content



Manufacturing process

Hansa has close collaborations with highly experienced European based third party CMOs

Drug substance production process (API)

Northway Biotech



Fermentation/ harvesting

- Working Cell Bank
- Pre-Cultivation
- Main Cultivation
- Cell Harvest

Protein purification

- Cell Disruption
- Protein Release

Protein purification cont.

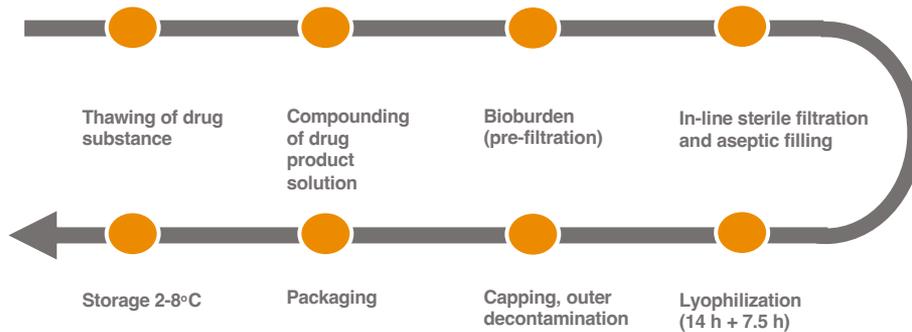
- Ion Exchange Chromatography
- Ceramic Hydroxy Apatite Chromatography
- Hydrophobic Interaction Chromatography
- Ultrafiltration/ Diafiltration

Filling

- Formulation, filtration, filling and storage (-80°C)

Drug product production process (upscaling)

Baxter



Thawing of drug substance

Compounding of drug product solution

Bioburden (pre-filtration)

In-line sterile filtration and aseptic filling

Storage 2-8°C

Packaging

Capping, outer decontamination

Lyophilization (14 h + 7.5 h)



Facts

- Based in Vilnius, Lithuania
- Start-up Year: 2004
- Capacity: 300 L fermentor (1000 L fermentor in 2020)
- Certifications: GMP compliance, Manufacturing authorization license
- Inspections: National regulatory agency (EU), EU/US customer inspections, FDA mock inspection



Facts

- Based in Halle/Westfalen Germany
- Start-up Year: 2001 (contract manufacturing)
- Capacity: 6-35 L drug product solution per batch (5,000-30,000 vials)
- Certifications: GMP compliance, Manufacturing authorization license
- Inspections: National regulatory agency (EU), FDA, EU/US customer inspections



Clinical development programs



Autoimmune attacks

A result of when the body's immune system by mistake damages its own tissue

Blood

Autoimmune hemolytic anemia,
Immune thrombocytopenia



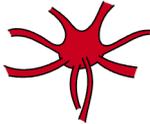
GI tract

Crohn's disease



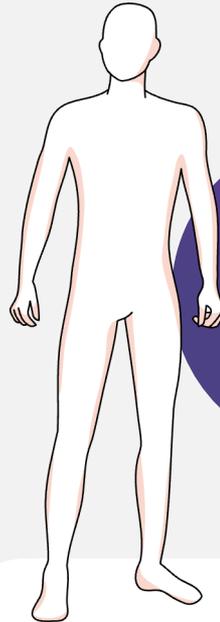
Nerves

Guillain-Barré syndrome,
Myasthenia gravis



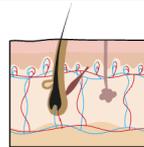
Lung

Wegner's granulomatosis



Skin

Psoriasis, Pemphigus



Over
100 different
types of
Autoimmune
disorders



Brain

Multiple sclerosis,
Neuromyelitis optica



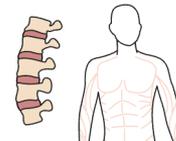
Thyroid

Hashimoto's disease,
Graves' disease



Kidney

Anti-GBM disease



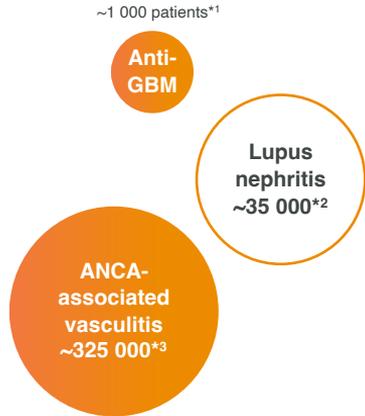
Bone and muscle

Rheumatoid arthritis,
Dermatomyositis+ 32

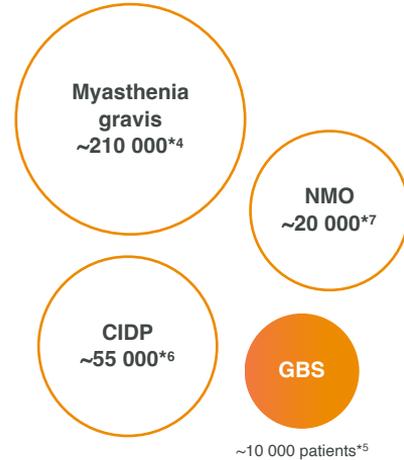
Hansa's antibody cleaving enzyme technology

may have relevance in several autoimmune diseases where IgG plays an important role in the pathogenesis

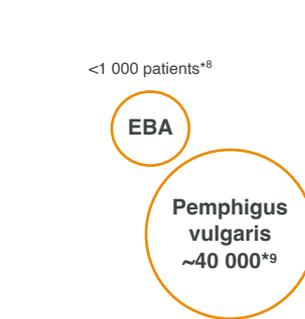
Rapidly progressive glomerulonephritis



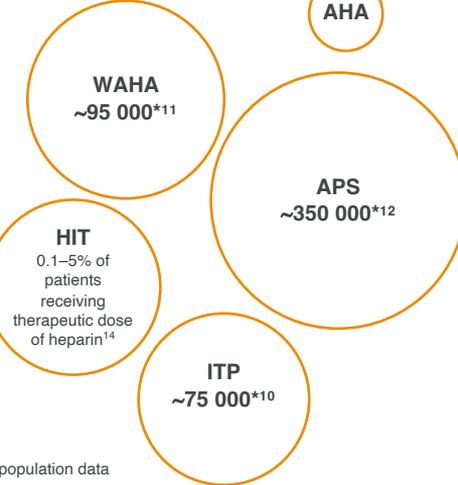
Neurological disorders



Skin disorders



Blood disorders



■ Clinical programs
 □ Potential autoimmune indications (currently not pursued)

*Total disease populations in EU & US, based on prevalence and population data

CIDP: Chronic inflammatory demyelinating polyradiculoneuropathy
NMO: Neuromyelitis optica
EBA: Epidermolysis bullosa acquisita
ITP: Immune thrombocytopenia
WAHA: Warm antibody hemolytic anemia
APS: Antiphospholipid syndrome
AHA: acquired hemophilia A
HIT: Heparin-induced thrombocytopenia

¹DeVrieze, B.W. and Hurley, J.A. *Goodpasture Syndrome*. StatPearls Publishing, Jan 2021.

²<https://www.ncbi.nlm.nih.gov/books/NBK459291/> [accessed 2021-03-29]

³Patel, M et al. *The Prevalence and Incidence of Biopsy-Proven Lupus Nephritis in the UK*. Arthritis & Rheumatism, 2006.

⁴Berti A, Cornec D, Crowson CS, Specks U, Matteson EL. *The Epidemiology of ANCA Associated Vasculitis in the U.S.: A 20 Year Population Based Study*. Arthritis Rheumatol, 2017;69.

⁵*Myasthenia Gravis*. National Organization for Rare Disorders. <https://rarediseases.org/rare-diseases/myasthenia-gravis/> [accessed 2021-03-29]

⁶Gullain-Barré syndrome. Orpha.net. https://www.orpha.net/consor/cgi-bin/OC_Exp.php?lng=GB&Expert=2103 [accessed 2021-03-29]

⁷*Chronic Inflammatory Demyelinating Polyneuropathy: Considerations for Diagnosis, Management, and Population Health*. The American Journal of Managed Care, <https://www.ajmc.com/view/chronic-inflammatory-demyelinating-polyneuropathy-considerations-for-diagnosis-management-and-population-health> [accessed 2021-03-29]

⁸Marrie, R.A. *The Incidence and Prevalence of Neuromyelitis Optica*. International Journal of MS Care, 2013 Fall; 113-118

⁹Mehren, C.R. and Gniadecki, R. *Epidermolysis bullosa acquisita: current diagnosis and therapy*. Dermatol Reports, 2011;10-05

¹⁰Wententeil, S. et al. *Prevalence Estimates for Pemphigus in the United States*. JAMA Dermatol, May 2019; 627-629.

¹¹*Immune Thrombocytopenia*. National Organization for Rare Disorders. <https://rarediseases.org/rare-diseases/immune-thrombocytopenia/> [accessed 2021-03-29]

¹²*Warm Autoimmune Hemolytic Anemia*. National Organization for Rare Disorders. <https://rarediseases.org/rare-diseases/warm-autoimmune-hemolytic-anemia/> [accessed 2021-03-29]

¹³Litvinova, E. et al. *Prevalence and Significance of Non-conventional Antiphospholipid Antibodies in Patients With Clinical APS Criteria*. Frontiers in Immunology, 2018;12-14.

¹⁴NORD. *Acquired Hemophilia* [accessed 2022-10-17], available at <https://rarediseases.org/rare-diseases/acquired-hemophilia/>

¹⁵Hogan M, Berger JS. *Heparin-induced thrombocytopenia (HIT): Review of incidence, diagnosis, and management*. Vascular Medicine. 2020;25(2):160-173. doi:10.1177/1358863X19898253

Anti-GBM, a rare acute autoimmune disease

Incidences

1.6

in a million affected annually^{1,2}

Standard of Care

- Plasma Exchange
- Cyclophosphamide (CYC)
- Glucocorticoids

Results from Phase 2 study of imlifidase in anti-GBM disease published in Journal of American Society of Nephrology (JASN)³

10 out of 15 patients were dialysis independent after six months vs. the historical cohort⁴, where only 18% had functioning kidney

Inflammation in the glomeruli

Early symptoms are unpecific...

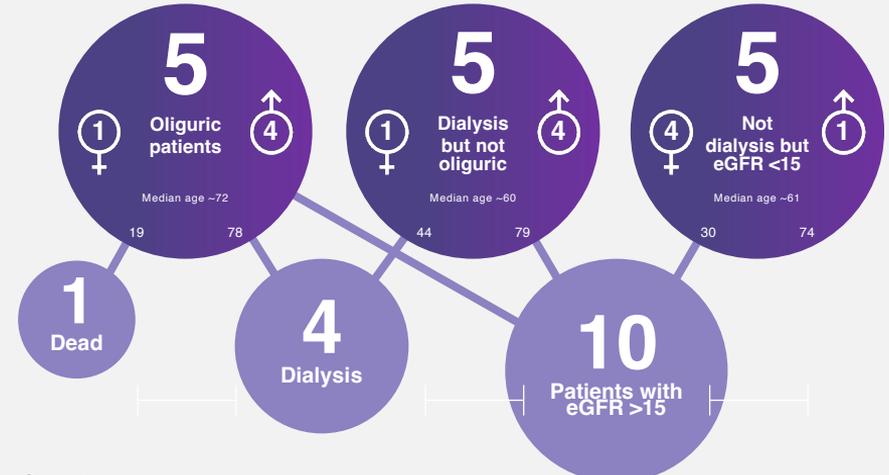
...but can lead to rapid destruction of the kidney and/or the lung

Data published in JASN

Endopeptidase Cleavage of Anti-GBM Basement Membrane Antibodies in vivo in Severe Kidney Disease: An Open-Label Phase 2a Study

Frederik Uhlin,^{1,2} Madeline Szpin,¹ Andreas Kronbichler,^{3,4} Annette Bruchfeld,^{1,5} Inga Soren,¹ Lovisa Westberg,⁶ Eric Dargatzis,⁷ Arnaud Lisonet,⁷ Nassim Kumar,¹⁰ Cedric Ruffat,¹¹ Mikko Myllyluoto,¹² Vladimir Tesar,⁶ Anders Remuzzi,¹³ Christian Eggers,¹⁴ Charlotte Elling,¹⁵ Stephen McAdoon,¹⁶ Johan Malmk,¹⁵ Ingeborg Bajema,¹⁴ Elisabeth Sorensen,¹⁴ and Martin Sogahard,¹⁷

ABSTRACT
Background The prognosis for kidney survival is poor in patients presenting with circulating anti-glomerular basement membrane (GBM) antibodies and severe kidney injury. It is unknown if treatment with an endopeptidase that cleaves circulating and kidney bound IgG can alter the prognosis.
Methods An investigator-driven phase 2a open-label study (NCT02064002) was performed in 17 hospitals in five European countries. A single dose of 0.25 mg/kg of imlifidase was given to 15 adults treated with cyclophosphamide and corticosteroids, but plasma exchange only if autoantibodies rebounded. The primary outcome was safety and dialysis independence at 6 months.
Results At inclusion, ten patients were dialysis dependent and the other five had eGFR levels between 7 and 14 mL/min per 1.73 m². The median age was 67 years (range 50-77), six were women, and six were also positive for antineutrophil cytoplasmic antibodies. Three 6 hours after imlifidase infusion, all patients had anti-GBM antibodies levels below the reference range of a preproliferated assay. At 6 months 6/15 (40%) were out of control (P=0.001). Patient's exact renal, eight serious adverse events (including one death) were reported, none assessed as probably or possibly related to the study drug.
Conclusions In this pilot study, the use of imlifidase was associated with a better outcome compared with conventional, without major safety issues, but the findings need to be confirmed in a randomized clinical trial.
Clinical Trial registration number: EUDRACT 2016-00402-2-39 (<http://www.clinicaltrialsregister.eu/ctsearch?text=2007-00137-26>)
 JASN 2023; 33(1): 146-150. doi: 10.1093/ajkd/kpab116



Sources:
¹ Wang et al., J. Intern. Med., 2015
² Desai et al., Front. Endocrinol., 2019
³ Uhlin et al. JASN (2023)
⁴ McAdoon et al.: Patients double-seropositive for ANCA and anti-GBM antibodies have varied renal survival, frequency of relapse, and outcomes compared to single-seropositive patients. Kidney Int 92: 693-702, 2017

New pivotal phase 3 trial with imlifidase in 50 anti-GBM patients to evaluate kidney function after six months

Study Design

- Open-label, controlled, randomised, multi-centre Phase 3 trial evaluating renal function in patients with severe anti-GBM disease imlifidase + SoC vs. SoC

Subjects

- 50 anti-GBM patients to be enrolled
- Patients will be followed for six months
- Recruitment at 30-40 clinics across US/UK/EU

Doses/Follow up time

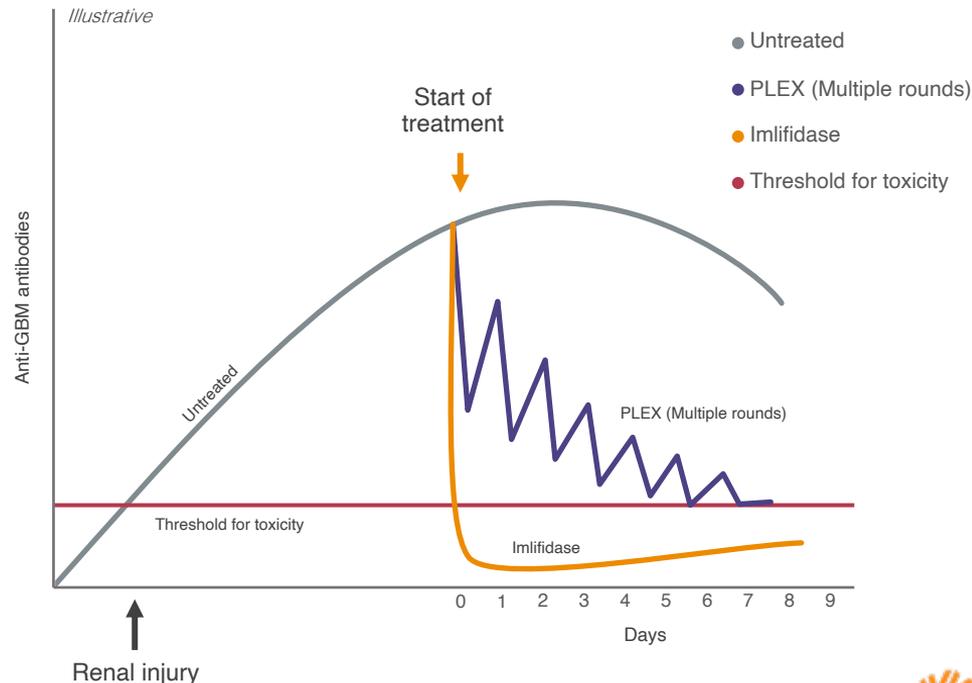
- Dosage 0.25mg/kg with 180 days follow up

Main Objectives

- Renal function is evaluated by estimated glomerular filtration rate (eGFR) at 6 months
- Dialysis need at 6 months

Status

- First patients enrolled in May 2023



Guillain-Barré Syndrome (GBS) is an aggressive acute autoimmune attack on the peripheral nervous system

Incidences

~10,000

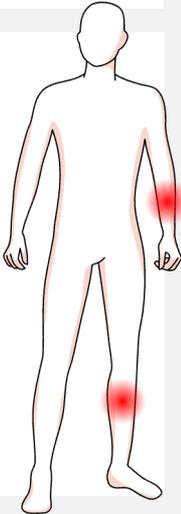
in 100,000 annually in 7 major markets

Standard of Care

- Intravenous immune globulin (IVIg) or
- Plasma Exchange (PLEX)

Indication

- Rapidly and progressively weakens extremities
- Triggered frequently by viral infections



High unmet need

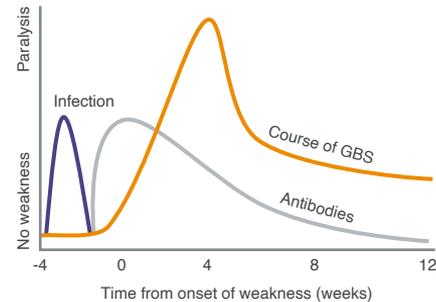
- 1/3 of hospitalized patients require mechanical ventilation
- Remaining long lasting symptoms in ca 40% of patients

FDA granted Orphan Drug Designation to imlifidase for the treatment of GBS

Phase 2 study to evaluate safety and effectiveness of imlifidase in patients diagnosed with GBS

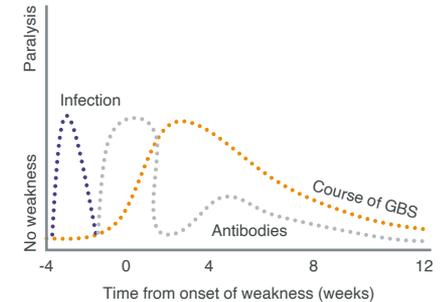
Today's Standard of Care IVIg or PLEX

Illustrative



Potential with imlifidase

Illustrative



Study design: Study is an open-label, single arm, multi-center trial in 30 patients

Data read-out: Topline data expected H2'2023; Comparative efficacy analysis to a match cohort (IGOS data base at Erasmus, Rotterdam) expected 2024

Sources:

¹⁾ McGrogan et al. Neuroepidemiology 2009;32(2): 150-63.

New investigator-initiated phase 2 study in ANCA-associated vasculitis

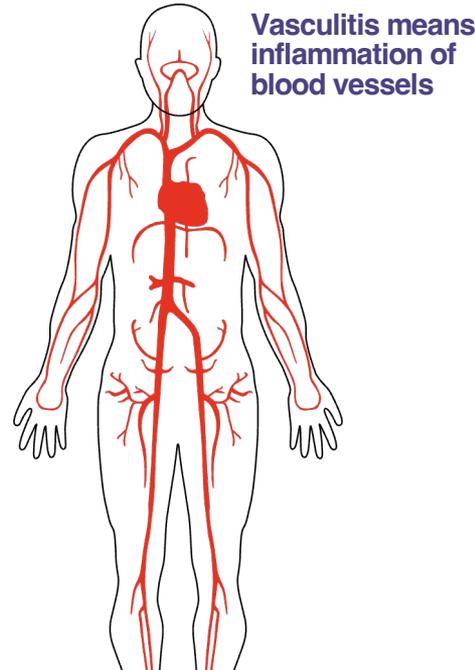
- a group of autoimmune diseases characterized by inflammation of blood vessels with very few treatment options today

Incidences

~3 in 100,000 annually across EU/US of which 8-36% are estimated to have Acute Respiratory Distress Syndrome due to pulmonary hemorrhage^{1,2}

Standard of Care

- Current protocol is Immunosuppression and Intensive support care



The investigator-initiated trial (IIT) is sponsored by Charité Universitätsmedizin, Berlin



Indication

- Causes damage to small blood vessels in the body resulting in inflammation and damage to organs, such as the kidneys, lungs etc.³
- Progress of the disease results in end stage kidney disease in 25 percent of patients⁵
- Most severe cases involving lungs lead to respiratory failure⁴
- Few treatment options today

Study design

- Single arm, single center, phase 2 study with the primary objective to evaluate efficacy and safety on top of SoC
- 10 patients with severe ANCA-associated vasculitis and Acute Respiratory Distress Syndrome will be treated with imlifidase on top of SoC
- First patient treated Q2 2023
- Trial led by Dr. Adrian Schreiber and Dr. Philipp Enghard at Charité

1. Bertl A, et al. Arthritis Rheum atol. 2017;69.
 2. Rathmann J, et al. RMD Open. 2023;9:e002949.
 3. Falk RJ, Jennette JC. The New England journal of medicine. 1988;318(25):1651-7.
 4. Flossmann O, et al. Annals of the rheumatic diseases. 2011;70(3):488-94.
 5. Booth AD, et al. American journal of kidney diseases. 2003;41(4):776-84.

Positive topline data from the imlifidase phase 2 study in antibody mediated rejection (AMR) episodes post kidney transplantation

Incidences

Acute AMR episodes occur in

5-7%

of annual kidney transplants¹
(2,500-3,500 patients across US/EU)

Standard of Care

- Intravenous immune globulin (IVIg) or
- Plasma Exchange (PLEX) or
- Steroids

Top-line data readout from phase 2 trial demonstrates a significant superior capacity of imlifidase to rapidly reduce levels of DSAs vs. PLEX (SoC) in the five days following the start of the treatment

High unmet need

- AMR is one of the most challenging adverse events after kidney transplantation leading to graft dysfunction and loss
- There is no approved treatment for AMR

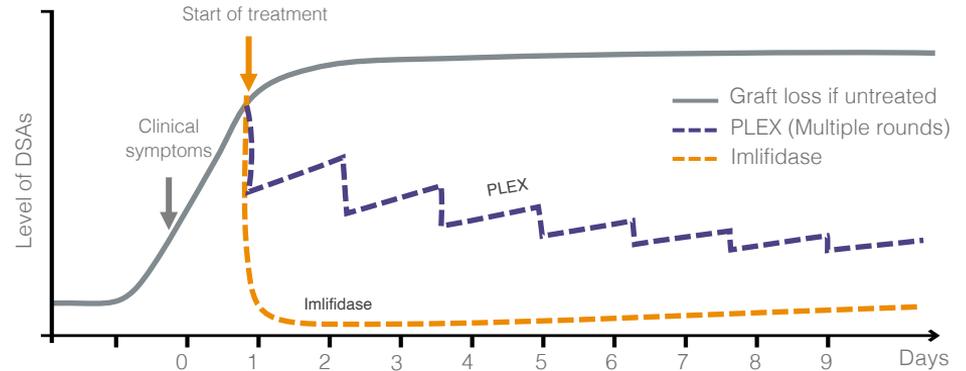
Phase 2 study design

30 patients with active or chronic active AMR episodes post kidney transplantation have been enrolled and randomized 2:1 to imlifidase vs. SoC

Full data read out from phase 2 study expected to be published in H2'23

Potential with imlifidase vs. PLEX in AMR

Illustrative



¹ Puttarajappa et al., Journal of Transplantation, 2012, Article ID 193724.

HNSA-5487, Hansa's next generation enzymes

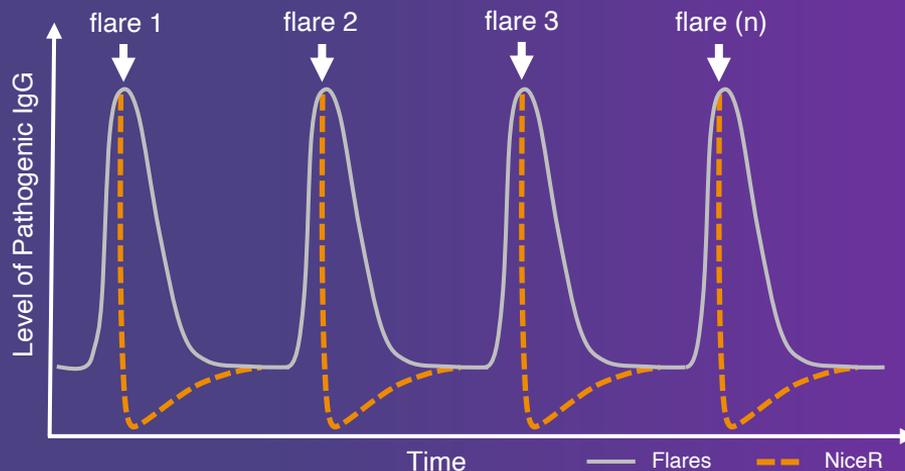
Objective to potentially enabling repeat dosing in autoimmune conditions, oncology, gene therapy and transplantation, where patients may benefit from more than one dose of an IgG-modulating enzyme

NiceR - Novel Immunoglobulin Cleaving Enzymes for Repeat dosing with lower immunogenicity

- Potential application for a broad array of indications, including reoccurring AMR, relapsing autoimmune diseases, gene therapy and oncology
- HNSA-5487, part of the Company's NiceR program, has been selected as the lead IgG-eliminating enzyme
- HNSA-5487 is an IgG-cleaving enzyme (cysteine peptidase) with characteristics based on a homolog to imlifidase, but with lowered immunogenicity
- Enrollment in the phase I study in healthy volunteers is completed. Data analysis is underway to evaluate relevant indications to pursue in clinical development.

Our next generation enzymes can potentially inactivate flares

Illustrative



Gene Therapy



Exploring opportunities in gene therapy

Exploring the opportunities in systemic administration of gene therapy for our unique antibody cleaving enzyme platform to potentially enable gene therapy treatment in NAb+ patients

A
revolutionary
approach

Significant
unmet need

Encouraging
pre-clinical
data

Partnership
strategy

Tropism and target tissue

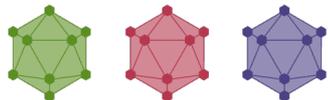
AAV subtypes targets different tissues



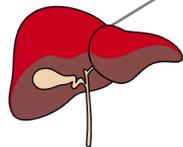
AAV 1, 2 & 5



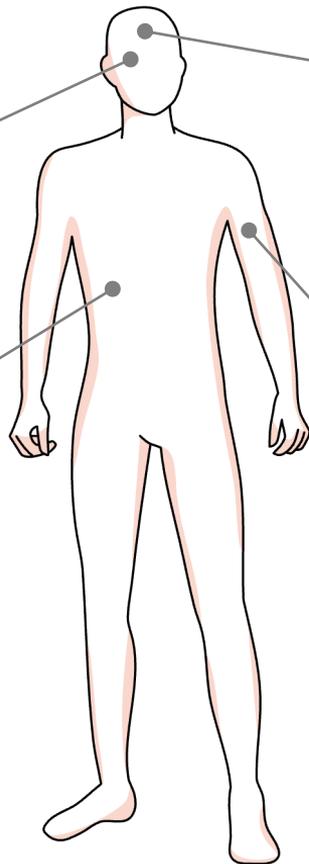
Eye (local target)
 $\sim 1 \times 10^{11}$ vg



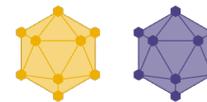
AAV 3, 7 & 8



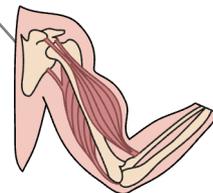
Liver (systemic)
 $\sim 1 \times 10^{14}$ vg



Brain (local target)
 $\sim 1 \times 10^{12}$ vg



AAV 4 & 8



Muscle (systemic)
 $\sim 1 \times 10^{15}$ vg



AAV 6, 7, rh74

Target tissues

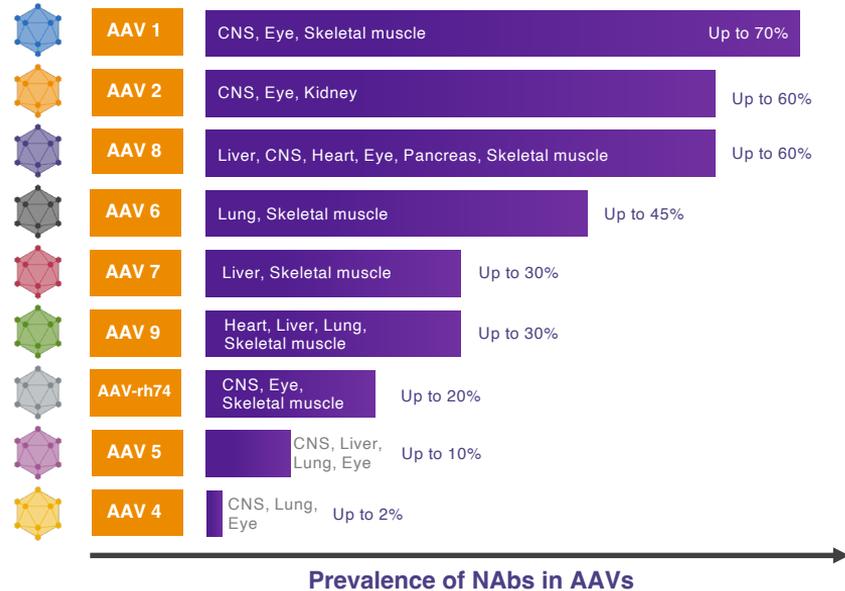
Dose of gene therapy (vg)

Introducing Adeno Associated Virus (AAVs)

AAVs, the delivery system of Gene Therapy

- Wildtype Adeno Associated Viruses (AAV) belong to the family of parvoviruses
- AAVs come in many serotypes with different tissue distribution
- They carry their genetic information as DNA and normally do not integrate into the host genome but remains in the cells as episomes
- Recombinant AAV is commonly used for gene delivery, resulting in safe and long-term expression of the transgene

Pre-existing antibodies towards AAVs are a limiting factor in Gene Therapy and excludes patients from clinical trials.

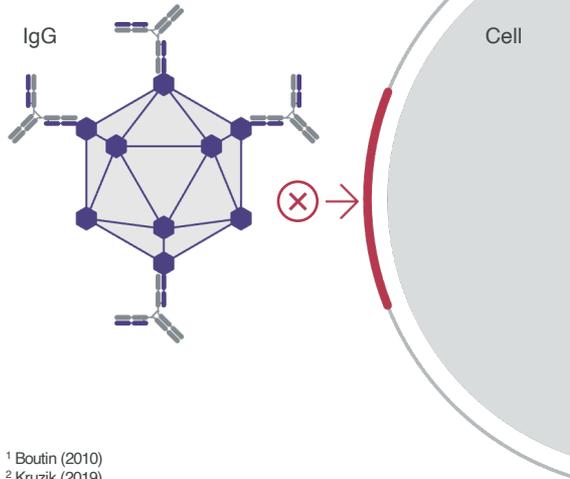


Source: Boutin et al. (2010), Griffin et al. (2019), Wang et al. (2018), Calcedo & Wilson (2013), Falese et al. (2017), Haiyan et al. (2017), Ellsworth et al. (2018), Greig et al. (2017)

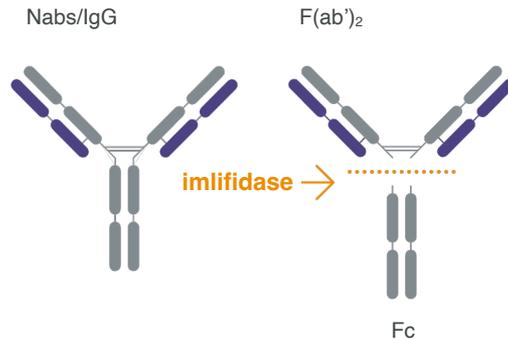
Neutralizing antibodies (Nabs) are immunological barriers in gene therapy; imlifidase may potentially eliminate Nabs

Between approximately 5%-70%^{1,2} of patients considered for gene therapy treatment carry neutralizing anti-AAV antibodies forming a barrier for treatment eligibility

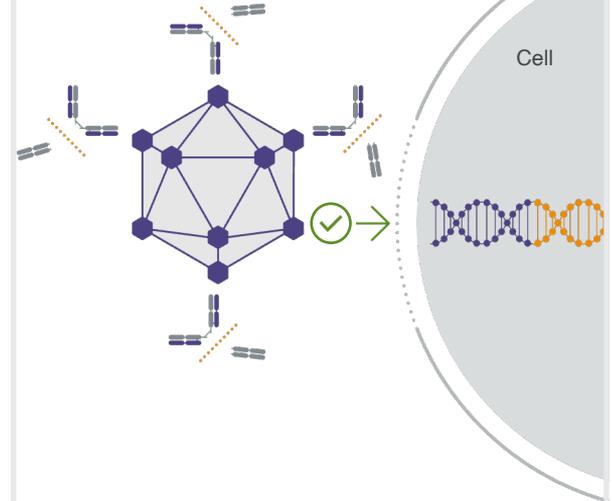
1 Antibodies prevent effective transfer of healthy gene sequence and can be a safety concern



2 Imlifidase is a unique IgG antibody-cleaving enzyme that cleaves IgG at the hinge region with extremely high specificity



3 The idea is to eliminate the neutralizing antibodies as a pre-treatment to enable gene therapy



¹ Boutin (2010)

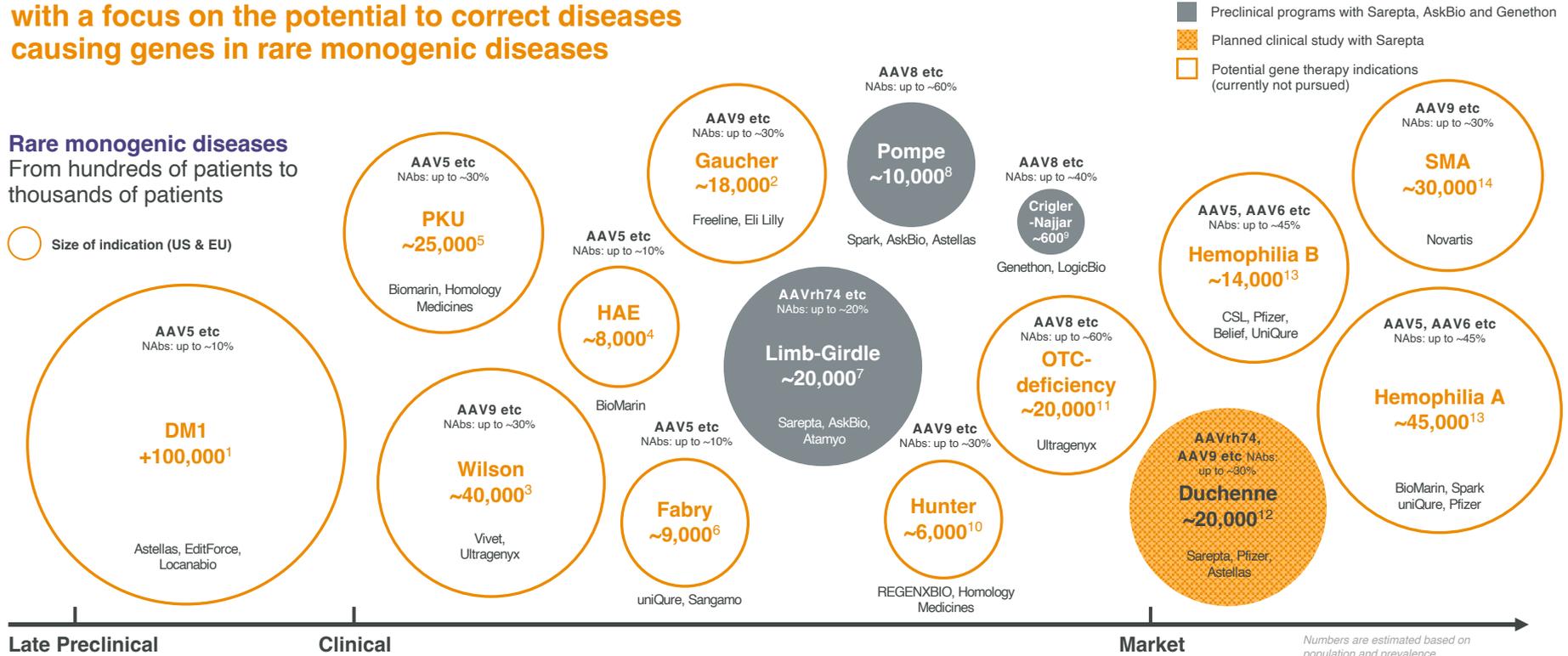
² Kruzik (2019)

Systemic gene therapy is an emerging opportunity

with a focus on the potential to correct diseases causing genes in rare monogenic diseases

Rare monogenic diseases
From hundreds of patients to thousands of patients

○ Size of indication (US & EU)



Late Preclinical

Clinical

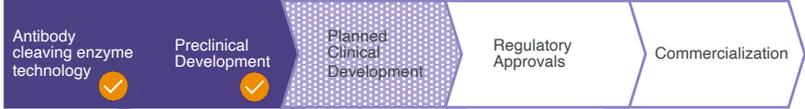
Market

Numbers are estimated based on population and prevalence

1. RareDiseases.org. <https://rarediseases.org/diseases/dm1/dm1-metformin/> [Accessed 2023-06-28]
 2. Medlineplus.gov. <https://medlineplus.gov/genetics/condition/dm1.html> [Accessed 2023-06-28]
 3. Santali TD, Lauren TL, Munk DE, Vitting H, Weiss KH, Qin P. The Prevalence of Wilson's Disease: An Update. Hepatology. 2020 Feb;71(2):722-732. doi: 10.1002/hep.23911. Epub 2020 Jan 31. PMID: 31449670.
 4. Grant A, Grant JA. Hereditary angioedema: epidemiology, management, and role of ecallinert. Biologics. 2013;7:1103-13. doi: 10.2147/BTT.S27568. Epub 2013 May 3. PMID: 2360243; PMCID: PMC3647445.
 5. Hillert A, et al. The Genetic Landscape and Epidemiology of Phenylketonuria. Am J Hum Genet. 2020 Aug 6;107(2):234-250. doi: 10.1016/j.ajhg.2020.06.006. Epub 2020 Jul 14. PMID: 32668217; PMCID: PMC7413669.
 6. Medlineplus.gov. <https://medlineplus.gov/genetics/condition/fabry.html> [Accessed 2023-07-12]
 7. Liang, WC., Jong, YJ., Wang, CH, et al. Clinical, pathological, imaging, and genetic characterization in a Taiwanese cohort with limb-girdle muscular dystrophy. Orphanet J Rare Dis. 15, 160 (2020). <https://doi.org/10.1186/s13023-020-1513-9>
 8. RareDiseases.org. <https://rarediseases.org/diseases/pompe/> [Accessed 2023-07-12]
 9. Genethon.com. <https://www.genethon.com/en/our-research/clinical-trials> [Accessed 2023-06-15]
 10. Gasila P, Rameelgim K, Bhadrashetty D. A rare case of mucopolysaccharidosis: Hunter syndrome. J Nat Sci Biol Med. 2012 Jan;2(1):97-100. doi: 10.4103/0976-9668.9584
 11. RareDiseases.org. <https://rarediseases.org/diseases/hunter-syndrome/> [Accessed 2023-07-12]
 12. Cristallini S, et al. Global epidemiology of Duchenne muscular dystrophy: an updated systematic review and meta-analysis. Orphanet J Rare Dis. 2020 Jun 5;15(1):141. doi: 10.1186/s13023-020-01433-8. PMID: 32615595; PMCID: PMC7273323
 13. CDC.gov. A new study of hemophilia occurrence finds many more cases in the United States. <https://www.cdc.gov/media/releases/2019/s0714-hemophilia.html>
 14. Genethon.com. <https://www.genethon.com/en/our-research/clinical-trials> [Accessed 2023-06-15]
 15. Weisbart, T.E.C., Robertson, A., Wilson, I.J., et al. Prevalence, incidence and carrier frequency of 5q-linked spinal muscular atrophy - a literature review. Orphanet J Rare Dis 12, 124 (2017). <https://doi.org/10.1186/s13023-017-0671-8>

Global exclusive agreements with three partners in gene therapy

To develop and promote imlifidase as pre-treatment ahead of gene therapy in select indications

Partner	Access to key resources	Indication exclusivity	Collaborative research, development and commercialization
	<ul style="list-style-type: none"> World leader within gene therapy targeted at muscular dystrophies Pre-clinical and clinical plan Regulatory Promotion FDA approval in 4–5-year-old kids suffering with DMD 	<p>Duchenne Muscular Dystrophy (DMD) 1/3,500 to 5,000 male births worldwide</p> <p>Limb-Girdle Muscular Dystrophy Global prevalence of ~1.6 per 100k individuals</p>	 
	<ul style="list-style-type: none"> Early innovator in gene therapy Conducts pre-clinical and clinical trials (Phase 1/2) 	<p>Pompe disease Approximate incidence is 1 per 40,000 births, or ~200 per year in the US + EU</p>	 <p>Exclusive option for AskBio to negotiate a potential full development and commercialization agreement</p>
	<ul style="list-style-type: none"> A pioneer in the discovery and development of gene therapies Conducts pre-clinical and clinical trials (Phase 1/2) 	<p>Crigler-Najjar syndrome Approximately incidence is 0.6-1 case per one million people or 600 patients in Europe and the U.S</p>	 <p>The initial agreement is focused on research and development The companies will consider a subsequent agreement for commercialization at a later stage</p>

Global and exclusive agreement with Sarepta Therapeutics

to develop and promote imlifidase as pre-treatment ahead of gene therapy in select indications



Indication exclusivity:

- Duchenne Muscular Dystrophy (DMD)
- Limb-Girdle Muscular Dystrophy (LGMD)

Hansa's key resources

- Imlifidase validated with positive clinical efficacy and safety data as well as European approval
- Positive preclinical data published in *Nature* (2020) and at *ASGCT* (May 2023)
- Clear path to U.S. approval (kidney transplant)



Sarepta's key resources

- World leader within gene therapy targeted at muscular dystrophies
- Pre-clinical plan: PoC and IND-tox
- Clinical / Regulatory
- Promotion
- FDA approval in 4–5-year-olds suffering with DMD

Collaborative research, development and commercialization – working together at every stage

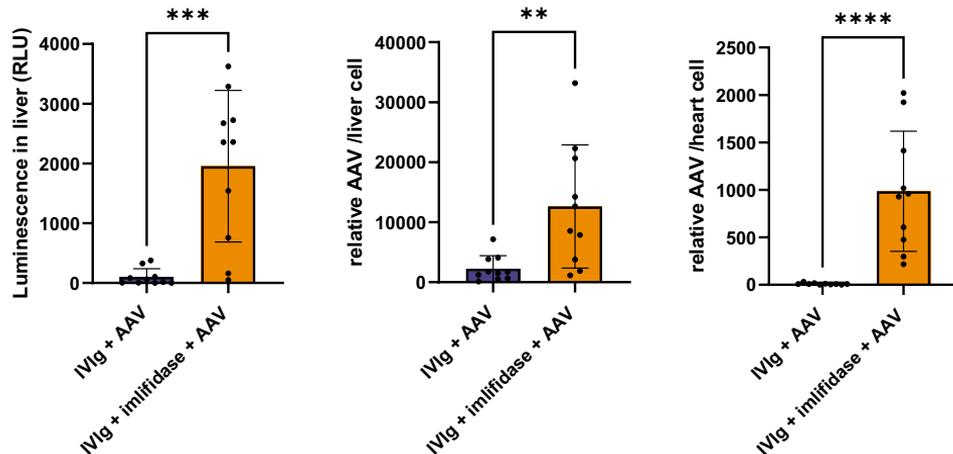


Imlifidase facilitates transduction of AAV8 in a mouse model

Imlifidase treatment neutralises the inhibitory effect of IgG and facilitates AAV8 transduction in target cells

In severe combined immunodeficient mice pre-immunised with human IgG, the AAV transduction is significantly improved in the presence of imlifidase compared to without imlifidase

Imlifidase has previously been highlighted in Nature Medicine¹ with encouraging outcome



Mice administrated with IVIg and AAV8 viral vectors in the absence or presence of imlifidase. Transgene luciferase expression is measured in liver lysates as relative luminescence units (RLU) (a). Transduction was measured in both liver (b) and heart (c) by qPCR analysis of total DNA and calculated as the relative AAV8 genomes/cell using primers specific for viral genomes (ITR) and normalised against a mice reference gene (actin). Mann-Whitney test were performed to evaluate the significance of the difference between the two groups, ** $p < 0.01$, *** $p < 0.001$, **** $p < 0.0001$. Data is presented as mean \pm SD, $n = 10$.



Leborgne et al. Nat Med (2020)

¹ Nature Medicine <https://doi.org/10.1038/s41591-020-0911-7>

Duchenne muscular dystrophy (DMD) is progressive and causes irreversible muscle damage and loss of function

Incidences

1 in **3,500** to **5,000**

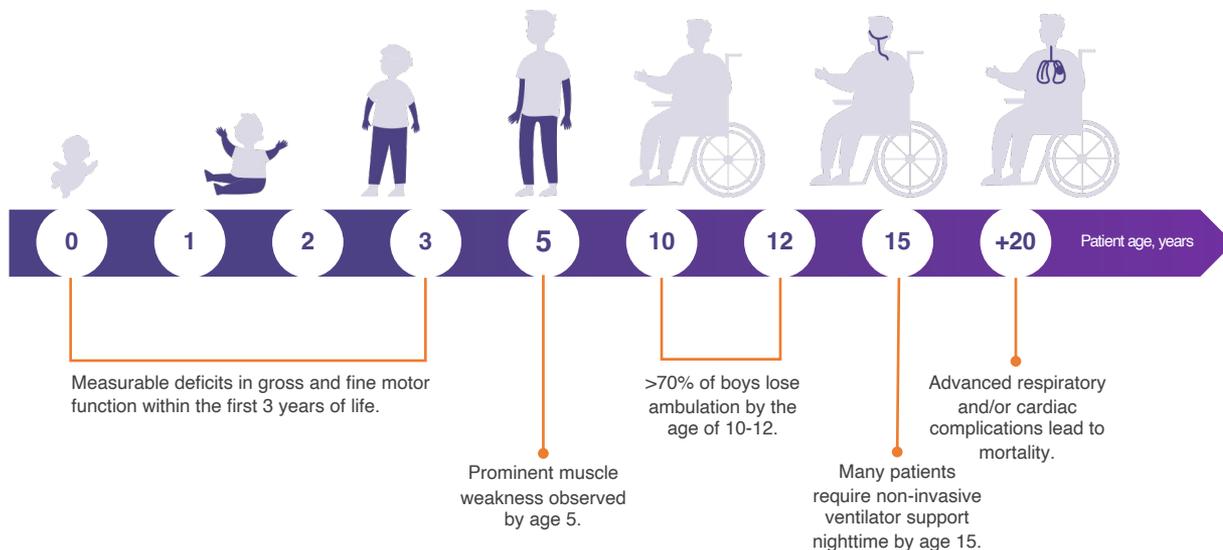
male births worldwide

~14% have pre-existing
IgG antibodies to rh74

High unmet need

- DMD is a rare, fatal neuromuscular genetic disease
- Muscle weakness noticeable by age 3-5, and most patients use a wheelchair by the time they are 12, many require respiratory aid by late teens.
- Life expectancy 26-30 years

DMD signs at early age, with most patients using a wheelchair by age 12



SRP-9001 has been rationally designed to maximize expression in tissues most affected by Duchenne

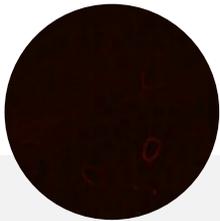
SRP-9001 gene therapy treatment

- SRP-9001 (delandistrogene moxeparvovec) AAVrh74 vector with a micro-dystrophin transgene
- Functional benefit as well as micro-dystrophin expression demonstrated

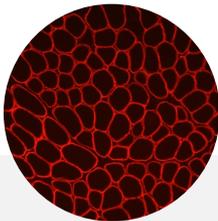
FDA approval in 4-5 year olds suffering with DMD

SRP-9001 treatment leads to restoration of DAPC, reduced CK, and improved histopathology

Pre-treatment



Post-treatment



4- to 5-year-old group showed significant improvement in North Star Ambulatory Assessment (NSAA) vs. placebo at week 48

For more details and data regarding Sarepta's gene therapy programs, please refer to www.sarepta.com

Limb-girdle muscular dystrophy (LGMD) is a group of diseases that cause weakness and wasting of the muscles

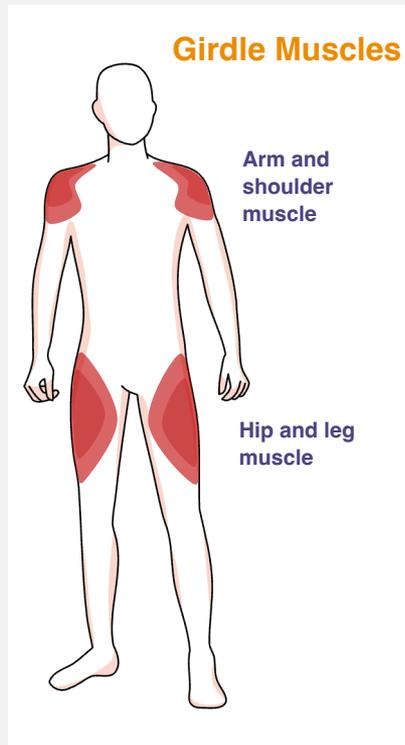
Incidences

1.63 per **100,000** individuals;
over 30 subtypes exist, and both
genders are affected equally.

~15% of patients have pre-
existing IgG antibodies to rh74

Indication

- Limb-Girdle can be caused by a single gene defect that affects specific proteins within the muscle cell
- Symptoms may appear at any age. Patients may have trouble getting out of chairs or climbing stairs. Eventually, they may need a wheelchair to get around.



SRP-9003 β -sarcoglycan (SGCB) gene therapy for treatment of LGMD2E

Initiation of VOYAGENE

On Feb 17, 2023, Sarepta announced that it had commenced dosing in the VOYAGENE study (Study SRP-9003-102) a Phase 1 trial of SRP-9003,

VOYAGENE is a U.S.-only study that will enroll ambulant patients aged 18 years or older and non-ambulant patients, ages 4-50 years, using clinical process SRP-9003 material.

Following positive results in the initial Phase 1 study SRP-9003-101 exploring two different doses, the VOYAGENE study will allow gathering additional data on the intended dose of SRP-9003 in a broader population of patients while finalizing plans for a global Phase 3 study (SRP-9003-301) that utilizes commercially representative material.

More information on the study is available at <https://genesislcmd.com/study/voyagene>

Collaboration with AskBio to evaluate imlifidase in gene therapy targeting Pompe disease

Feasibility program to evaluate imlifidase as pre-treatment ahead of gene therapy in Pompe disease for patients with pre-existing neutralizing antibodies (NAbs) to adeno-associated virus (AAV)



Hansa's key resources and deliverables

- Imlifidase validated with positive clinical efficacy and safety data as well as European approval
- Significant know-how around antibody cleaving enzymes
- Clear path to U.S. approval (kidney transplant)
- Hansa supplies material and provides additional support



Fully owned subsidiary of Bayer AG

AskBio's key resources and deliverables

- Early innovator in the Gene Therapy space with AAV platform and ongoing clinical stage Pompe disease program
- Conducts pre-clinical and clinical trials according to agreed plan

Current agreement scoped around a feasibility program which covers preclinical work and a Phase 1/2 study

Exclusive option for AskBio to negotiate a potential full development and commercialization agreement



Pompe disease, an ultra-rare disease is caused by the deficiency of an enzyme called alpha-glucosidase (GAA)

Incidences

An ultra-rare indication impacting

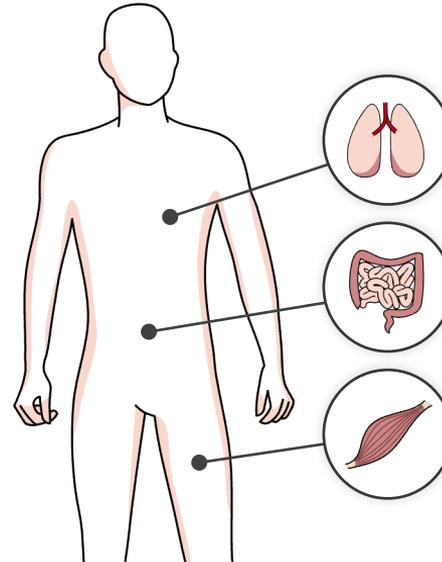
1 in **40,000** births or **~200** cases per year across US and Europe

~40-60% patients have pre-existing IgG antibodies to AAV8

Indication

- Defect in a gene making an enzyme called acid alpha-glucosidase (GAA), which is used to break down glycogen
- Accumulation of glycogen result in severe impact on the normal organ and muscle function

Late Onset Pompe Disease



Respiratory

- Respiratory failure
- Diaphragm weakness, sleep-disordered breathing
- Orthopnoea, dyspnea, aspiration

Gastrointestinal

- Difficulty chewing/jaw muscle fatigue
- Poor weight gain/maintenance
- Swallowing difficulties/weak tongue

Musculoskeletal

- Proximal muscle weakness, muscle pain
- Frequent falls, gait abnormalities, difficulty walking/climbing stairs/getting up
- EMG abnormalities, elevated CK, MRI changes

Sources:

¹Pompe Disease, <https://rarediseases.org/rare-diseases/nmopa-disease/> [accessed 2023-05-15]

²Calculated by Hansa on the basis of incidence numbers from <https://rarediseases.org/rare-diseases/nmopa-disease/> and life expectancy estimates from <https://nmopediseasenews.com/late-onset-nmopa-disease/>, as well as population statistics for the United States and European Union/Europe.

³ESGCT 27th Annual Congress Abstracts, Sensitivity of different AAV serotypes to pre-existing NABs, https://www.esgct.eu/home/Barcelona%202019/NEW_All%20Barcelona%20Abstracts.pdf

⁴Prevalence of serum IgG and neutralizing factors against adeno-associated virus (AAV) types 1, 2, 5, 6, 8, and 9 in the healthy population: implications for gene therapy using AAV vectors. Hum Gene Ther. 2010. <https://pubmed.ncbi.nlm.nih.gov/20095819/>

Collaboration with Genethon to evaluate imlifidase in gene therapy targeting Crigler-Najjar Syndrome



Hansa's key resources and deliverables

- Imlifidase validated with positive clinical efficacy and safety data as well as European approval and clear path to U.S. approval
- Significant know-how around antibody cleaving enzymes
- Hansa supplies material and provides additional support



Genethon's key resources and deliverables

- A pioneer in the discovery and development of gene therapies
- A not-for-profit organization
- Conducts pre-clinical and clinical trials (Phase 1/2)



Initial agreement focused on research and development



Upon completion the two companies will consider a subsequent agreement for commercialization



Crigler-Najjar (CN) syndrome is an ultra-rare hereditary disorder caused by deficiency in UGT1A1 (liver enzyme)

Incidences

An ultra-rare indication impacting

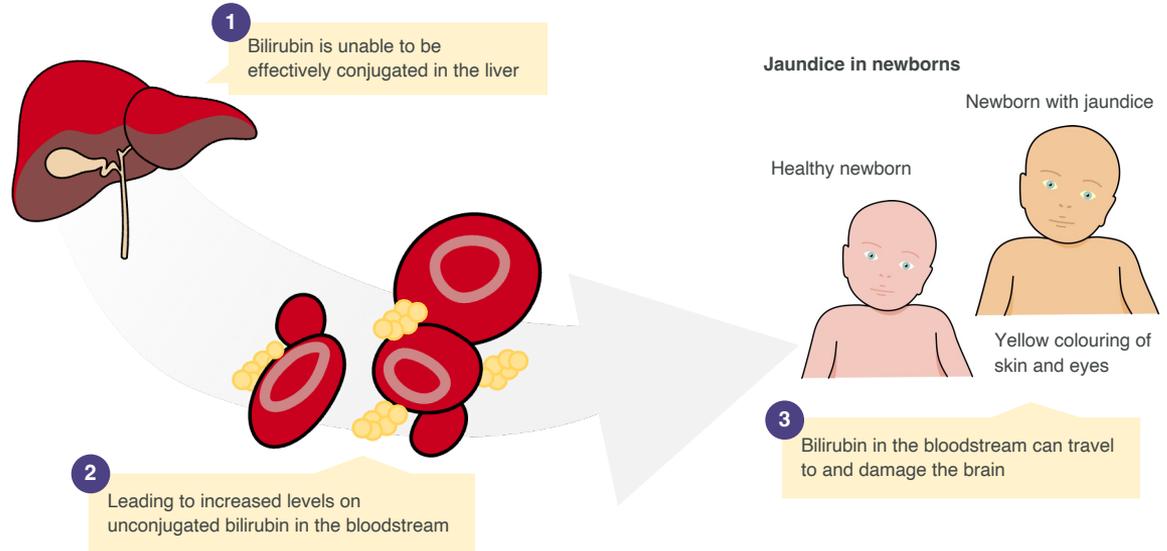
0.6-1 per **1,000,000** newborns around the world^{1,2}

~30% of patients have pre-existing IgG antibodies to AAV8

Indication

- Build-up of free bilirubin in serum and body tissues, which can become toxic in the brain³
- Severity can vary from mild to severe, no medication approved for treatment so far

Build-up of free bilirubin in serum and tissue can become toxic in the brain



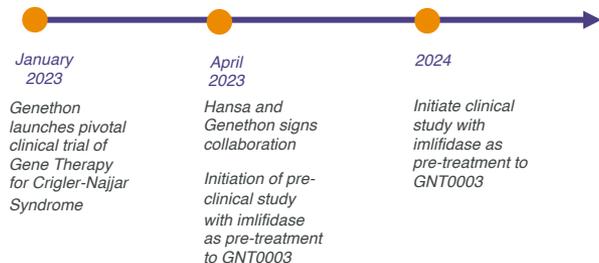
Sources:
¹Collaud F, Bortolussi G, Guianvarc'h L, Aronson SJ, Bordet T, Veron P, Charles S, Vidal P, Sola MS, Rundwasser S, Dufour DG, Lacoste F, Luc C, Wittenberghe LV, Martin S, Le Bec C, Bosma PJ, Muro AF, Ronzitti G, Hebben M, Mingozi F. Preclinical Development of an AAV8-hUGT1A1 Vector for the Treatment of Crigler-Najjar Syndrome. Mol Ther Methods Clin Dev. 2019 Mar 15;12:157-174.
²Ebrahimi A, Rahim F. Crigler-Najjar Syndrome: Current Perspectives and the Application of Clinical Genetics. Endocr Metab Immune Disord Drug Targets. 2018;18(3):201-211.
³American Liver Foundation. <https://liverfoundation.org/liver-diseases/pediatric-liver-information-center/pediatric-liver-disease/crigler-najjar-syndrome/> [Accessed 2023-06-13]

Feasibility program to evaluate imlifidase as pre-treatment to Genethon's gene therapy in patients with severe Crigler-Najjar syndrome

Study design and timeline

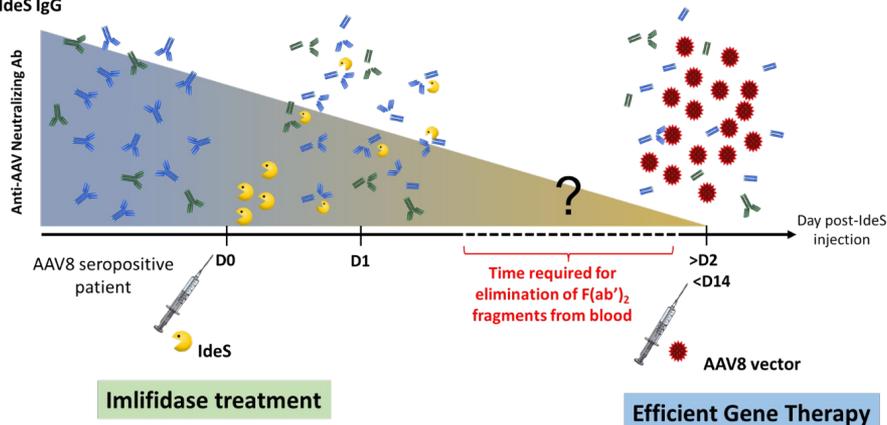
- Study expected in a small patient population
- GNT0003: 5E12 vg/kg
- Imlifidase: 0.25 mg/kg (possible with two doses)

Timeline



Evaluation of safety and efficacy of “GNT0003” in seropositive to AAV8 patients pre-treated with imlifidase

anti-AAV8 IgG
anti-IdeS IgG



Source: <https://www.genethon.com/>

ESG Overview



At Hansa we are committed to driving our business forward in a sustainable way guided by three strategic ESG principles



Healthy people

Address unmet medical need and ensure equitable access to care



Healthy business

Make a difference by operating an ethical, transparent and responsible business and cultivate an engaged culture of collaboration, inspiration and innovation



Healthy planet

Embrace sustainable decision making and environment stewardship



Formalising our ESG approach

At Hansa, we have always strived to achieve sustainable business practices. We are now formalizing our approach to sustainability and ESG issues, starting with identifying our key material focus areas.



Our mission: We leverage our unique enzyme technology platform to develop innovative, lifesaving and life altering immunomodulating therapies, bring these to the patients with rare diseases who need them, and generate value to society at large.

Our key ESG material aspects

Environment

Climate & waste impacts of production and logistics

Hansa's environmental impact is small because our production is limited in volume. However, as we grow, we need to be transparent about, and make efforts to limit, our climate and waste impacts.



Social

Unmet needs and equity in health

Patients with rare conditions in general, and highly sensitized patients in particular, have many unmet needs which our therapies help address. These unmet needs can also be reinforced by ethnic or socio-economic status, particularly regarding access to organ transplants. Collaboration with patient groups can help us reach even more patients who can benefit from our treatments.



Putting patients first

In the biopharma industry, there is a risk that patient access to innovative treatment is delayed. Hansa can therefore provide bridge financing on a case-by-case basis to benefit patients who have limited treatment options.



Employee wellbeing, diversity and inclusion

Ensuring employee wellbeing, diversity and inclusion is a fundamental commitment at Hansa. It is also essential for attracting talent in a fast-growing organization and delivering on our strategy.



Third-party risks

We diligently select new business partners, as well as monitor our existing partners and require them to comply with all laws and regulations and our Code of Conduct.



Pricing

In Europe, value-based pricing and universal health coverage is common, but in other countries access is a pressing issue. We can expand access to unfunded patients through collaboration with patient groups.



Governance

Safety, efficacy and ethics

To build a successful company and achieve our mission to extend and enhance the lives of the patients we serve, we must hold ourselves to the very highest standards. Trust is at the core of everything we do.



Return to investors

Biopharma companies need to remain economically attractive as an investment, so as to continue to secure capital and develop new treatments.



UN Sustainable Development Goals

The Sustainable Development Goals (SDGs) were adopted by all UN Member States in 2015 as a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity by 2030. They have since become a gold standard for sustainability across businesses, and each of our recommended factors have been developed to align with relevant goals.



Capital Markets



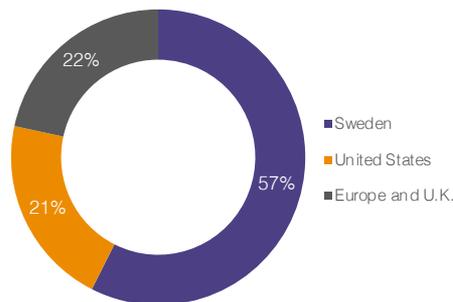
Ownership in Hansa Biopharma

Top 10 shareholders as per June 30, 2023

Name	No. of shares	Ownership
Redmile Group, LLC	10,626,131	20.3%
Försäkrings AB Avanza Pension	2,382,092	4.5%
Fjärde AP-Fonden (AP 4)	2,207,397	4.2%
Nexttobe AB	2,155,379	4.1%
Olausson, Thomas	1,917,000	3.7%
Tredje AP-Fonden (AP 3)	1,389,650	2.6%
Handelsbanken Asset Management	879,183	1.7%
Jeansson, Theodor	860,000	1.6%
C WorldWide Asset Management	799,749	1.5%
VOB & T Trading AB	644,800	1.2%
Other	28,582,581	54.6%
Total	52,443,962	100.0%

Classification of ownership as per June 30, 2023

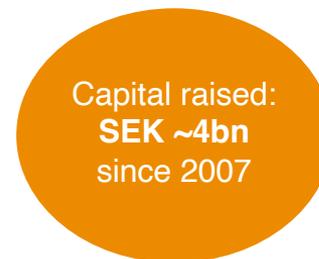
Ownership by region



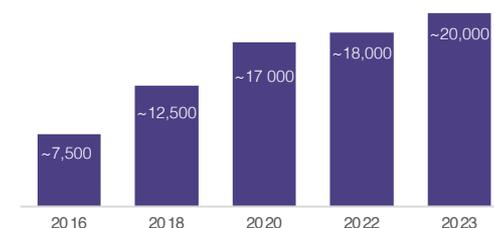
Ownership by type



Capital Raises



No. of shareholders



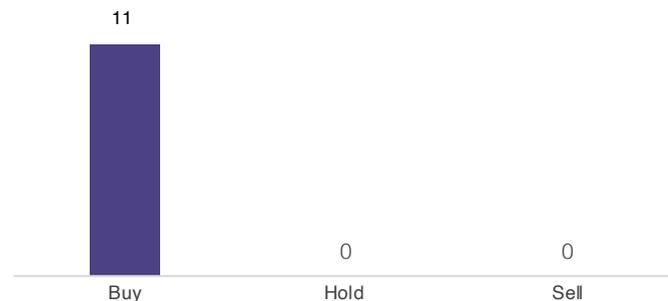
Company collected consensus

Consensus is based on a collection of analyst estimates pre-Q2 2023 report (July 2023)

	Price Target, SEK	WACC	Patient uptake, EU				Revenue, SEKm			
			Q2'23e	FY'23e	FY'24e	FY'25e	Q2'23e	FY'23e	FY'24e	FY'25e
Average	200	12%	9	53	114	195	36	212	378	1,013
Median	215	12%	9	52	101	182	33	214	350	738
High	244	13%	10	69	180	246	43	258	525	2,902
Low	135	8%	8	44	93	150	33	163	273	568
Number of contributions	7	7	5	8	8	7	5	8	8	8

	EBIT, SEKm				Operating Cash Flow, SEKm				Cash position, SEKm			
	Q2'23e	FY'23e	FY'24e	FY'25e	Q2'23e	FY'23e	FY'24e	FY'25e	Q2'23e	FY'23e	FY'24e	FY'25e
Average	-172	-633	-551	-251	-160	-607	-515	-273	1,121	974	860	973
Median	-171	-637	-587	-352	-160	-590	-569	-365	1,121	925	622	645
High	-169	-471	-149	808	-130	-530	-180	816	1,147	1,610	2,054	2,958
Low	-176	-737	-757	-639	-191	-732	-690	-590	1,095	760	110	-425
Number of contributions	5	8	8	8	2	8	8	8	2	8	8	8

Analyst recommendations



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Bank/Research Institution	Analyst	Location	E-mail
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Calendar and events

July 20, 2023

Aug 23, 2023

Aug 24, 2023

Aug 31, 2023

Sept 11, 2023

Sept 11, 2023

Sept 14, 2023

Sept 14, 2023

Oct 2, 2023

Oct 5-6, 2023

Oct 12, 2023

Oct 19, 2023

Nov 21, 2023

Nov 22, 2023

Half-year Report for January-June 2023

Carnegie non-deal road show, Stockholm

Erik Penser Company Day, Stockholm

HC Andersen – Life Science seminar (virtual)

HC Wainwright Annual Global Investment Conference, NYC

MorganStanley Global Healthcare Conference, NYC

Pareto Annual Healthcare Conference, Stockholm

Erik Penser Company Day, Malmö

Redeye: Autoimmune and inflammatory disease, Stockholm

Cowen US non-deal road show

Redeye: Afterwork, Malmö

Interim Report for January-September 2023

SEB Healthcare Seminar 2023, Stockholm

Ökonomisk Ugebrev Life Science event, Copenhagen

