

Innovation and therapeutic focus



# Research & Early development

**CMD22**  
CAPITAL MARKETS DAY

3 MARCH



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# Forward-looking statements

Novo Nordisk's reports filed with or furnished to the US Securities and Exchange Commission (SEC), including the statutory Annual Report 2021 and Form 20-F, which both were filed with the SEC in February 2022 in continuation of the publication of this Annual Report 2021, this presentation, and written information released, or oral statements made, to the public in the future by or on behalf of Novo Nordisk, may contain forward-looking statements. Words such as 'believe', 'expect', 'may', 'will', 'plan', 'strategy', 'prospect', 'foresee', 'estimate', 'project', 'anticipate', 'can', 'intend', 'target' and other words and terms of similar meaning in connection with any discussion of future operating or financial performance identify forward-looking statements. Examples of such forward-looking statements include, but are not limited to:

- Statements of targets, plans, objectives or goals for future operations, including those related to Novo Nordisk's products, product research, product development, product introductions and product approvals as well as cooperation in relation thereto,
- Statements containing projections of or targets for revenues, costs, income (or loss), earnings per share, capital expenditures, dividends, capital structure, net financials and other financial measures,
- Statements regarding future economic performance, future actions and outcome of contingencies such as legal proceedings, and
- Statements regarding the assumptions underlying or relating to such statements.

These statements are based on current plans, estimates and projections. By their very nature, forward-looking statements involve inherent risks and uncertainties, both general and specific. Novo Nordisk cautions that a number of important factors, including those described in this presentation, could cause actual results to differ materially from those contemplated in any forward-looking statements.

Factors that may affect future results include, but are not limited to, global as well as local political and economic conditions, including interest rate and currency exchange rate fluctuations, delay or failure of projects related to research and/or development, unplanned loss of patents, interruptions of supplies and production, including as a result of interruptions or delays affecting supply chains on which Novo Nordisk relies, product recalls, unexpected contract breaches or terminations, government- mandated or market-driven price decreases for Novo Nordisk's products, introduction of competing products, reliance on information technology including the risk of cybersecurity breaches, Novo Nordisk's ability to successfully market current and new products, exposure to product liability and legal proceedings and investigations, changes in governmental laws and related interpretation thereof, including on reimbursement, intellectual property protection and regulatory controls on testing, approval, manufacturing and marketing, perceived or actual failure to adhere to ethical marketing practices, investments in and divestitures of domestic and foreign companies, unexpected growth in costs and expenses, failure to recruit and retain the right employees, failure to maintain a culture of compliance, epidemics, pandemics or other public health crises, and factors related to the foregoing matters and other factors not specifically identified herein.

For an overview of some, but not all, of the risks that could adversely affect Novo Nordisk's results or the accuracy of forward-looking statements in this Annual Report 2021, reference is made to the overview of risk factors in 'Risk management' of this Annual Report 2021.

Unless required by law, Novo Nordisk is under no duty and undertakes no obligation to update or revise any forward-looking statement after the distribution of this Annual Report 2021, whether as a result of new information, future events, or otherwise.

## Important drug information

Victoza® and Ozempic® are approved for the management of type 2 diabetes only  
Saxenda® and Wegovy® are approved in the USA and the EU for the treatment of obesity only

# Strategic aspirations 2025



Purpose and sustainability (ESG)

- Progress towards zero environmental impact
- Being respected for adding value to society
- Ensure distinct core capabilities and evolve culture



Commercial execution

- Strengthen Diabetes leadership - aim at global value market share of more than 1/3
- Strengthen Obesity leadership and double current sales<sup>1</sup>
- Secure a sustained growth outlook for Rare disease



Innovation and therapeutic focus

- **Further raise the innovation-bar for diabetes treatment**
- **Develop a leading portfolio of superior treatment solutions for obesity**
- **Strengthen and progress the Rare disease pipeline**
- **Establish presence in Other serious chronic diseases focusing on CVD, NASH and CKD**

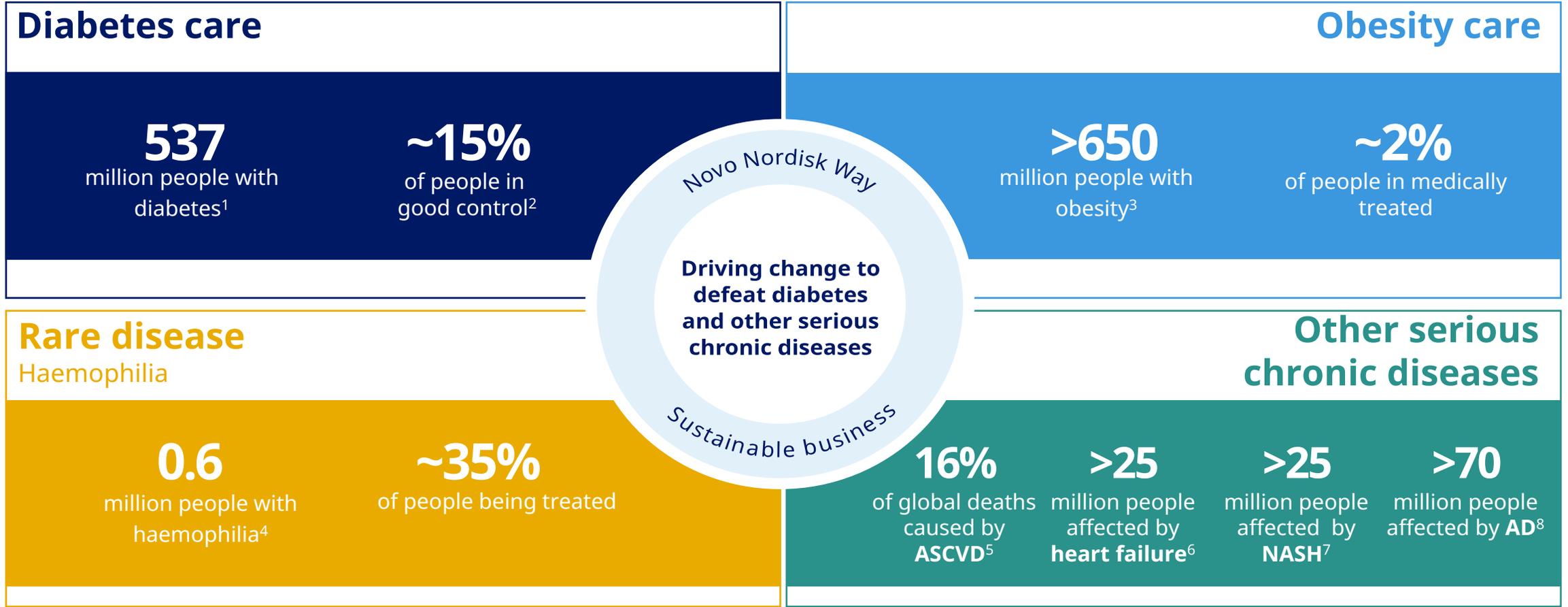


Financials

- Deliver solid sales and operating profit growth
  - Deliver 6-10% sales growth in IO
  - Transform 70% of sales in the US<sup>2</sup>
- Drive operational efficiencies across the value chain to enable investments in future growth assets
- Deliver free cash flow to enable attractive capital allocation to shareholders

<sup>1</sup> Based on reported sales in 2019, <sup>2</sup> From 2015 to 2022, 70% of sales to come from products launched from 2015. IO: International Operations; CVD: Cardiovascular disease; NASH: Non-alcoholic steatohepatitis; CKD: Chronic kidney disease. Note: The strategic aspirations are not a projection of Novo Nordisk's financial outlook or expected growth.

# Innovation starts with addressing unmet needs, improving outcomes and reaching more patients



<sup>1</sup>International Diabetes Federation: Diabetes Atlas 10<sup>th</sup> edition, 2021; <sup>2</sup>Real-world studies indicate between 30-55% of patients reach HbA<sub>1c</sub> target <7% .e.g. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4388968/>, taking 42.5% in good control of treated people; <sup>3</sup>World Health Organisation; <sup>4</sup> WFH annual survey 2020 (120 of 147 countries responded): Prevalence by calculating expected number of patients using 20.9 per 100.000 in haemophilia. Identified patients as proxy for receiving some sort of treatment; <sup>5</sup> "The top 10 causes of death", WHO, 9 December 2020 (ASCVD denoted as ischaemic heart disease); <sup>6</sup>Global Public Health Burden of Heart Failure, Apr. 2017: <https://pubmed.ncbi.nlm.nih.gov/28785469/>; <sup>7</sup>Estes C, Modeling the epidemic of non-alcoholic fatty liver disease demonstrates an exponential increase in burden of disease, Hepatology, 2018; <sup>8</sup>The World Alzheimer Report 2015, The Global Impact of Dementia, Alzheimer's Disease International (ADI), London.

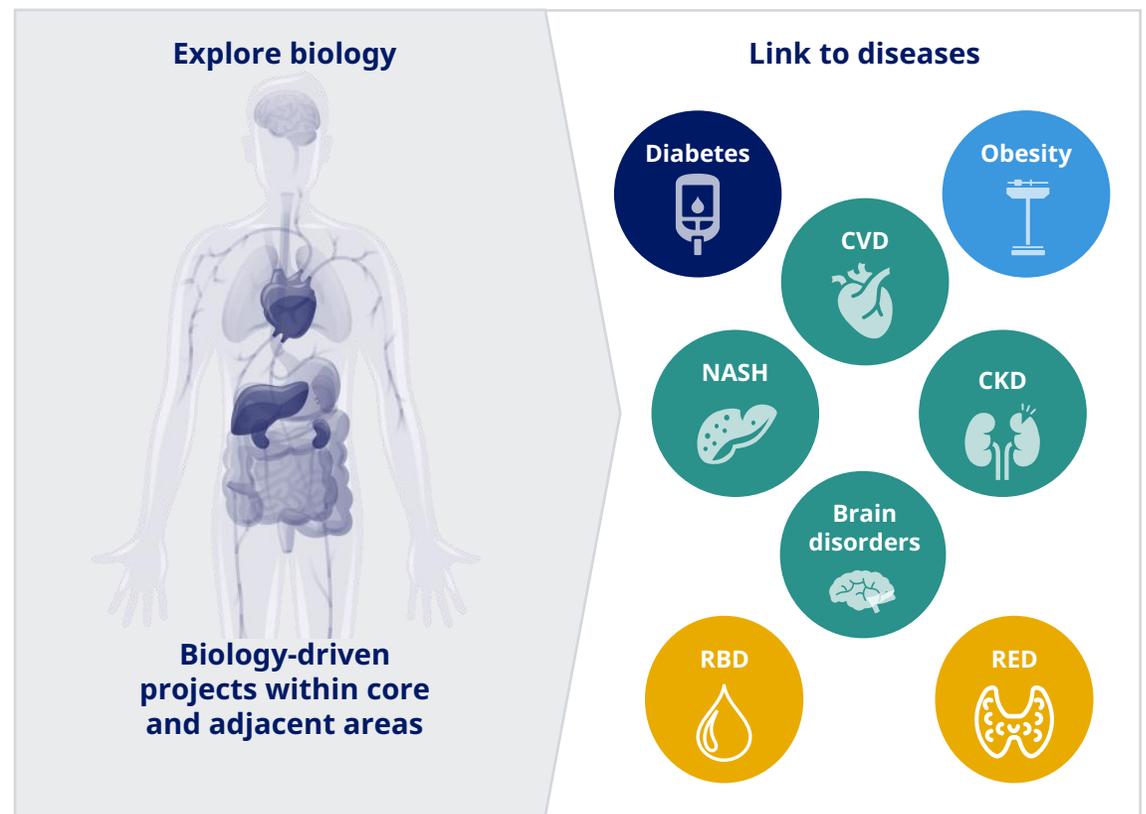
# Biology-driven and disease agnostic approach to drug discovery

## Exploring and understanding GLP-1 biology opened up our ability to address more diseases



<p><b>Pancreas</b></p> <ul style="list-style-type: none"> <li>↑ Glucose-dependent glucagon secretion</li> <li>↓ Glucose-dependent insulin secretion</li> <li>↑ Beta-cell function</li> <li>↑ Beta-cell apoptosis</li> <li>↓ Insulin biosynthesis</li> </ul>	<p><b>Brain</b></p> <ul style="list-style-type: none"> <li>↓ Body weight</li> <li>↓ Food intake</li> <li>↓ Satiety</li> </ul>
<p><b>Heart</b></p> <ul style="list-style-type: none"> <li>↓ CV risk</li> <li>↓ Fatty acid metabolism</li> <li>↑ Cardiac function</li> <li>↓ SBP</li> <li>↓ Inflammation</li> </ul>	<p><b>Stomach</b></p> <ul style="list-style-type: none"> <li>↓ Gastric emptying</li> </ul>
<p><b>Liver</b></p> <ul style="list-style-type: none"> <li>↓ Endogenous glucose production</li> <li>↑ Hepatic insulin sensitivity</li> <li>↓ De novo lipogenesis</li> <li>↓ Lipotoxicity</li> <li>↓ Steatosis</li> </ul>	

## Driving disease agnostic drug discovery within core and adjacent areas

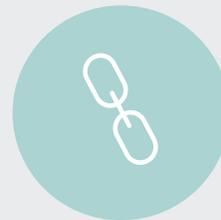


# A human-centric approach improves understanding of people with serious chronic disease and is key to identify new targets



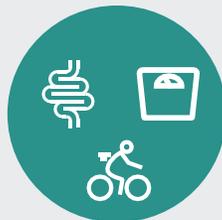
## From:

- Guided by literature or partners towards target discovery in a given disease
- In vitro and in vivo experiments towards validation



## To:

- Analyses of human cohort data, linking genetics to disease incidence
- Beyond traditional approach to clinical data by including life-style insights, anthropometric measurements, biomarkers, etc.



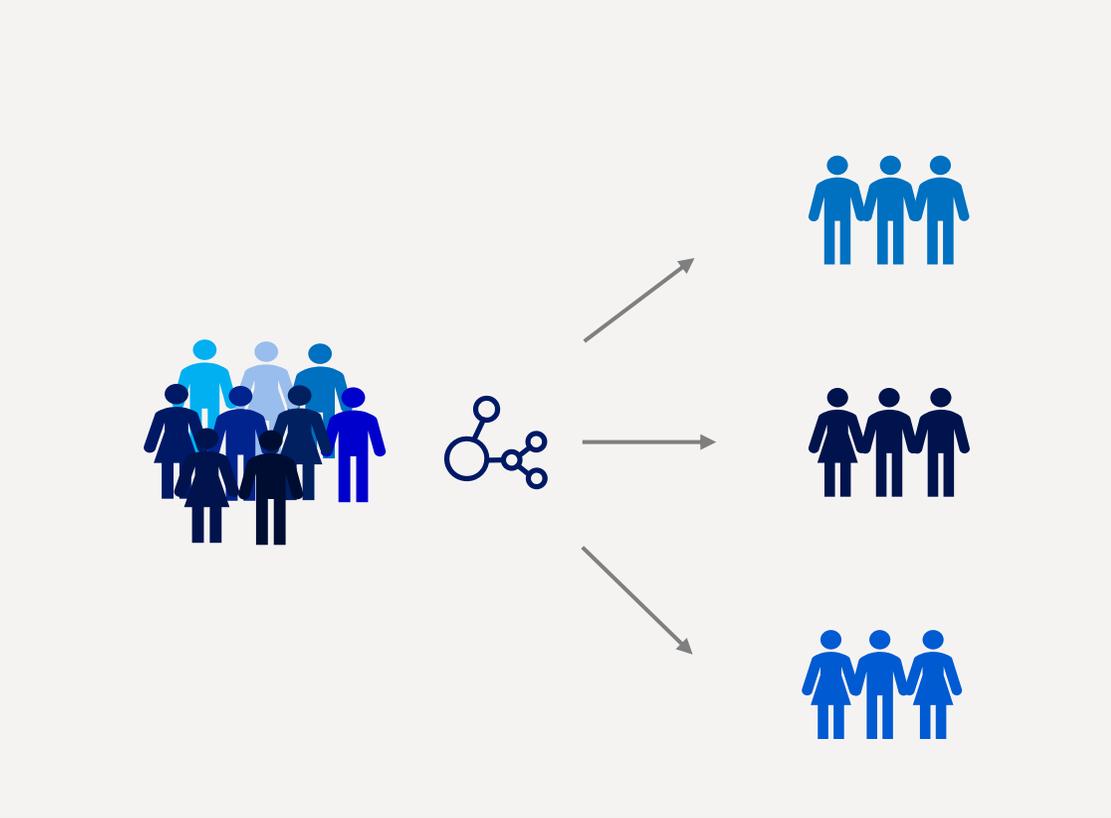
**A biological root cause**

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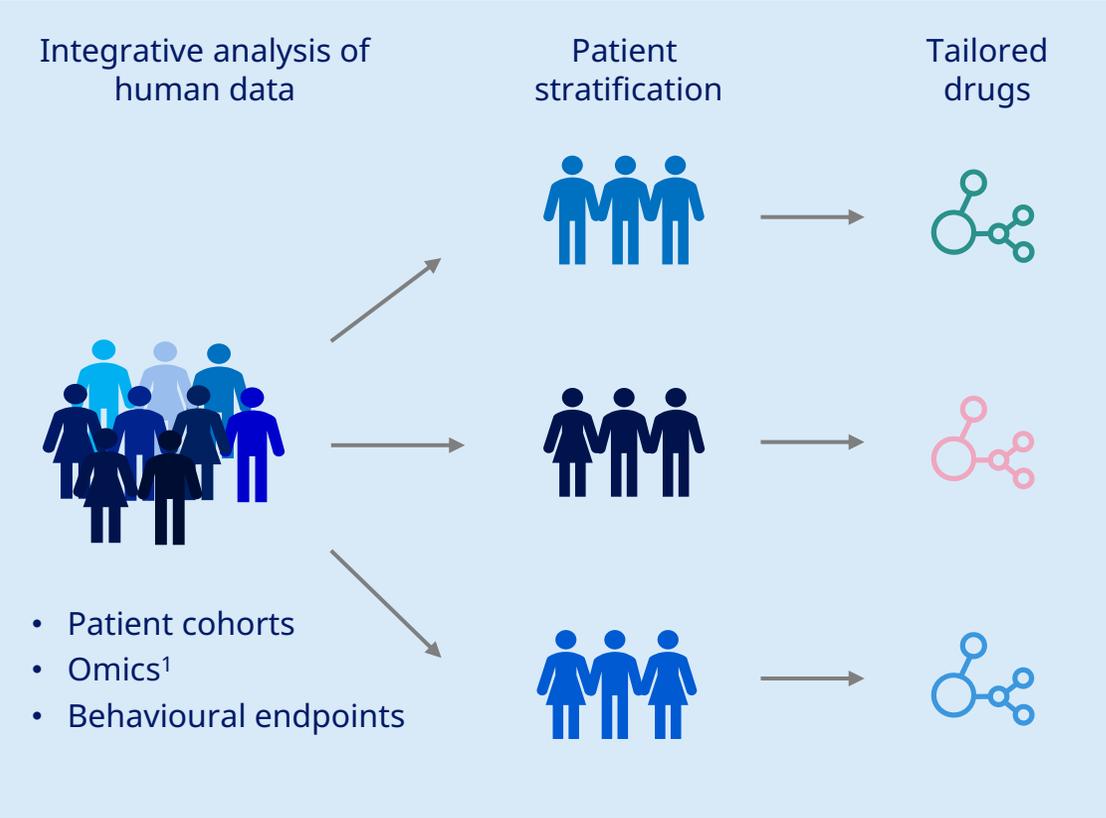
**A biological target to address**

# Precision medicine drives better outcomes for a specific patient population

## From one size fits all medicine

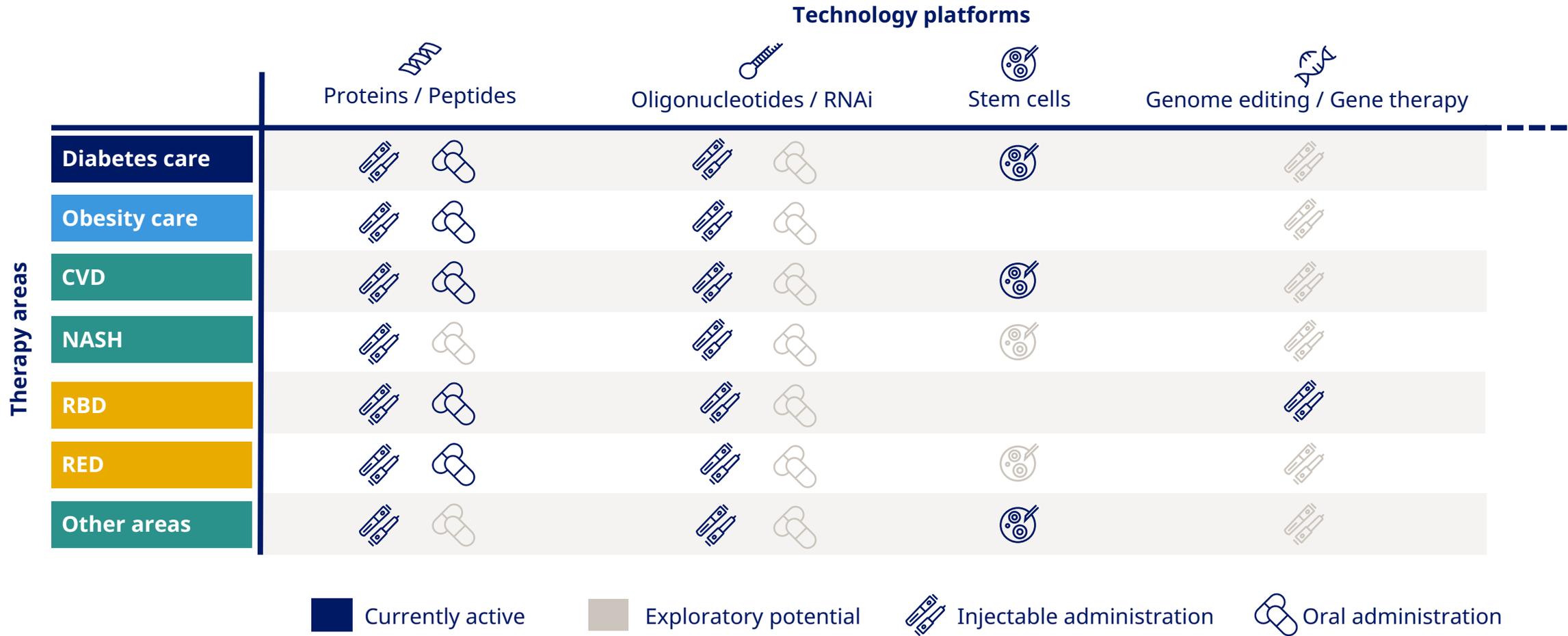


## To precision medicine powered by digitalisation



<sup>1</sup>Omic relates to various disciplines in biology with names ending on -omics, such as genomics, proteomics, metabolomics, etc.

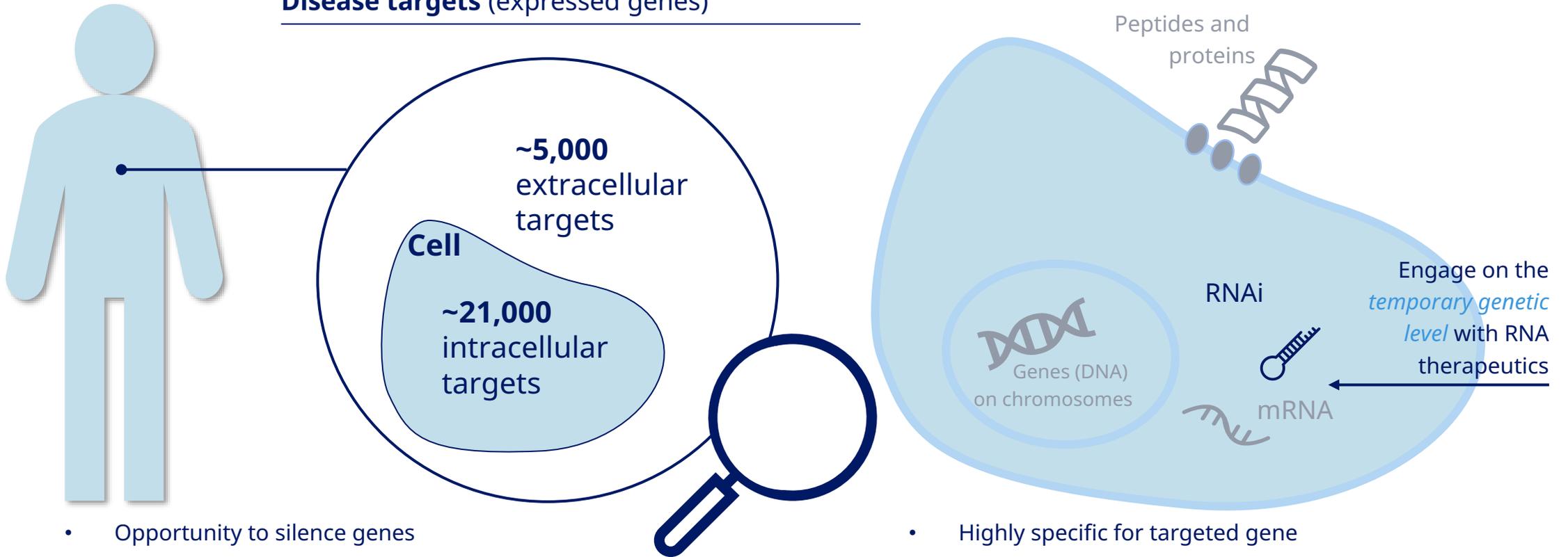
# Core capabilities and additional technology platforms open up new opportunities across therapy areas



Note: Currently active means Novo Nordisk is currently pursuing research projects, while exploratory potential indicates that the platform is potentially applicable for the given disease  
 RBD: Rare blood disorders; RED: Rare endocrine disorders; CVD: Cardiovascular disease; NASH: Non-alcoholic steatohepatitis; RNA: Ribonucleic acid

# With the RNAi technology intracellular targets become accessible for Novo Nordisk

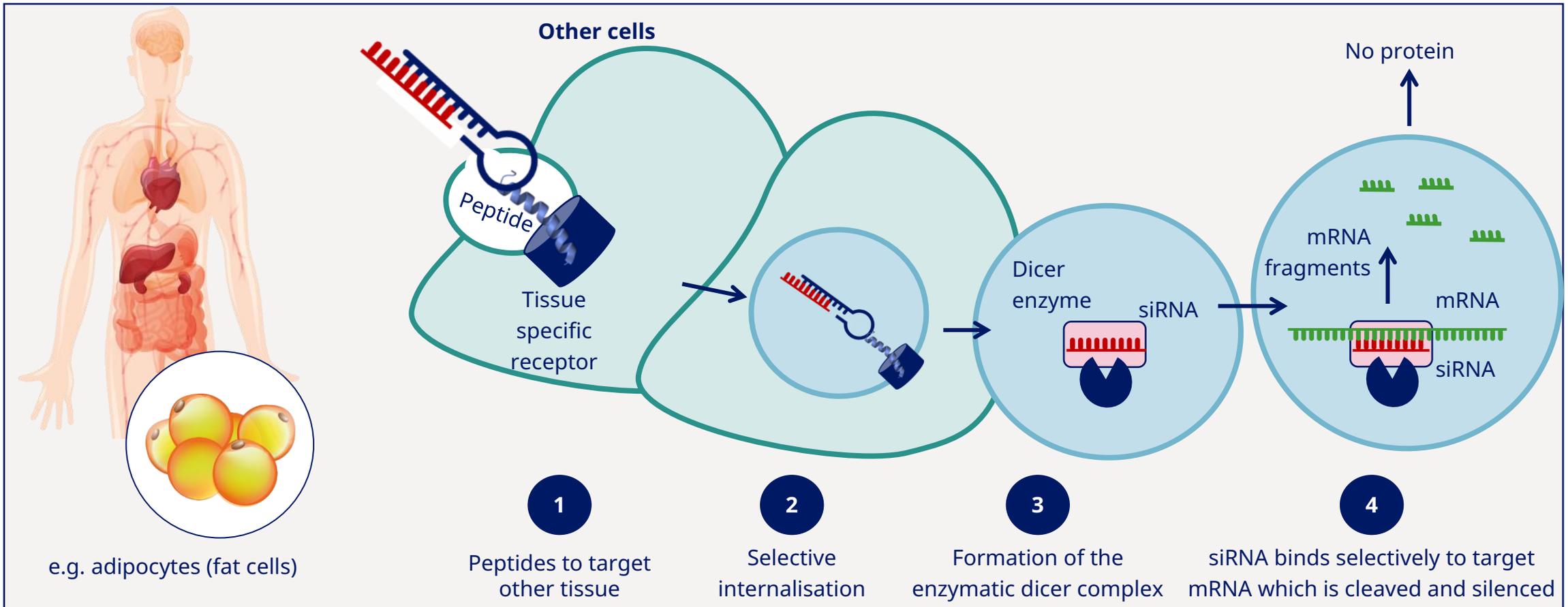
## Disease targets (expressed genes)



- Opportunity to silence genes
- Drugability of intracellular targets

- Highly specific for targeted gene
- Reversible yet long-acting therapies

# Historically, Dicerna's RNAi technology was used for hepatocytes – now the technology is explored beyond liver targets



RNA: Ribonucleic acid; siRNA: small interfering RNA; mRNA: messenger RNA  
Note: The dicer enzyme is cleaving double stranded RNA to small fragments. It activates the RNA induced silencing complex (RISC)

# The addition of RNAi technology is expected to improve productivity and accelerates number of first human doses

## Novo Nordisk and Dicerna

- Productive partnership since 2019
- Planning first human dose project in 2022
- Dicerna is an addition to Novo Nordisk's already existing Transformational research units (TRU)
- Dicerna will operate as a TRU
- Working as a TRU enables:
  - the agility and speed of a smaller biotech company
  - at the scale and quality of a pharmaceutical company

## A platform with broad application across therapy areas

Diabetes care

Obesity care

CVD

NASH

RBD

RED

Other areas

**Ambition of generating...**

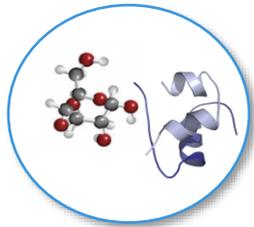
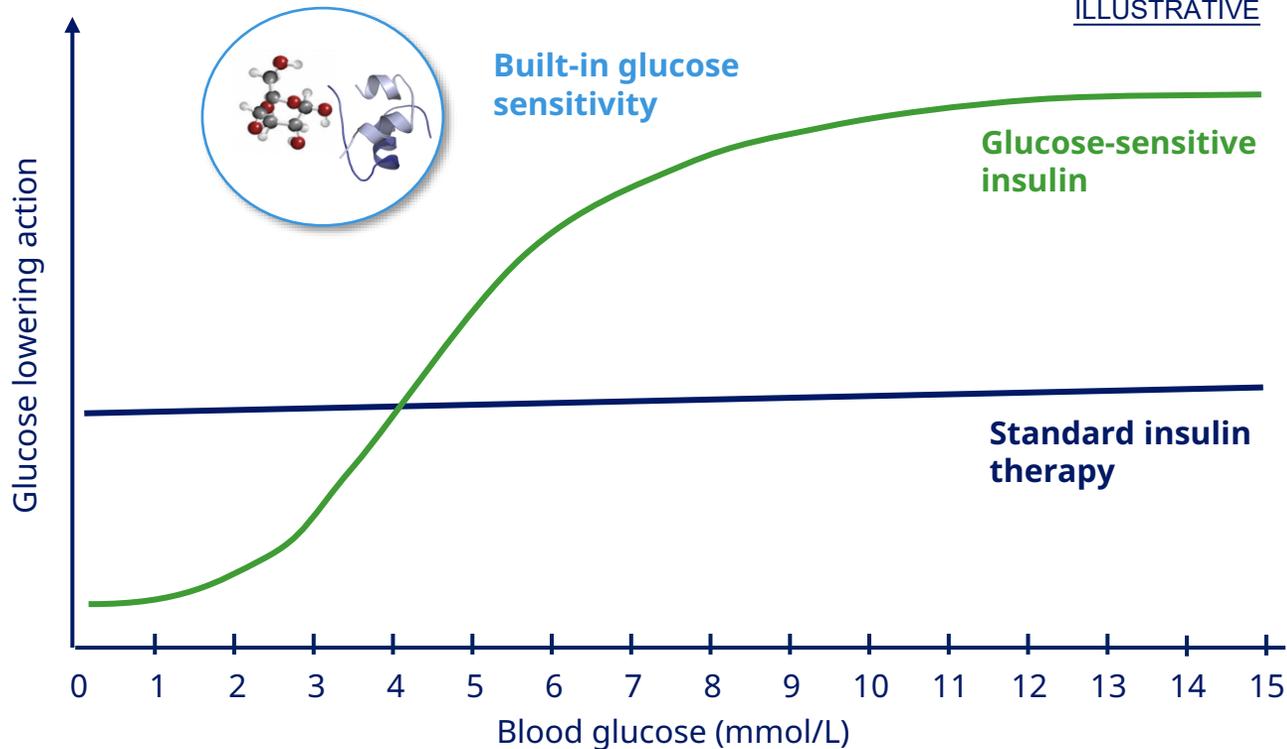
**3**

...first human dose projects on average per year across disease areas with the RNAi platform

# Protein and peptide innovation is the starting point, and the ambition is to develop a glucose-sensitive insulin

**Designing a smart, glucose-responsive insulin to normalise glucose and reduce or eliminate hypoglycaemia**

ILLUSTRATIVE



**Proof of principle for first Glucose-sensitive insulin achieved with insulin 845**

Phase 1 trial completed with glucose-sensitive insulin 845

- Demonstrated proof-of-principle of glucose-sensitive properties
- Appeared to have a safe and well-tolerated profile
- Exploratory proof-of-concept ongoing with expected completion in second half of 2022

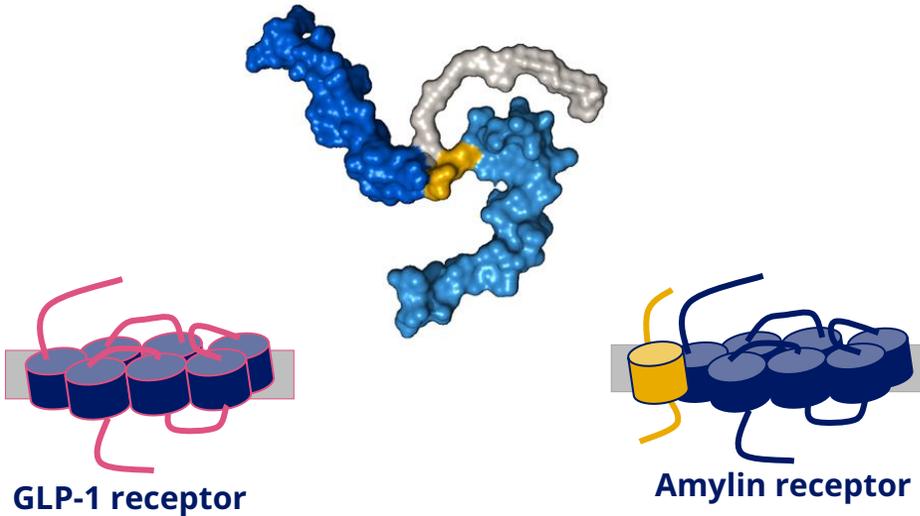
Further research and development of glucose-sensitive insulin to optimise properties is being evaluated

Note: Proof-of-principle is defined as demonstrating feasibility of a new mechanism in a clinical setting; Proof-of-concept is defined as verifying a new concept having practical potential in a clinical setting

# Protein and peptide expertise combined with oral technology enables oral amycretin entering phase 1

Amycretin is a GLP-1 and amylin receptor co-agonist intended for oral delivery

Phase 1 single dose and multiple dose trial for oral amycretin in obesity to be initiated in 2022



People living with overweight or obesity, and otherwise healthy



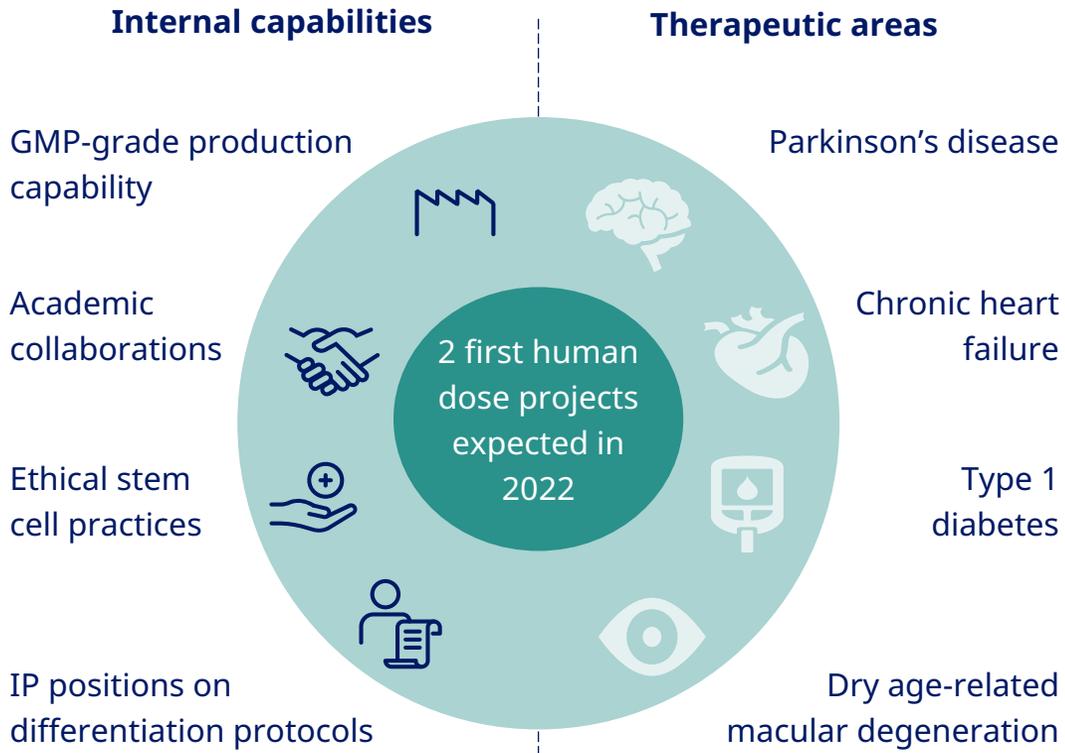
Utilising the SNAC technology

- Trial objectives**
- Assess the safety and tolerability of oral amycretin
  - Assess PK profile and explore PD effects
- Next steps**
- Phase 1 initiation expected during 2022

# Potential first human dose with cell therapy in collaboration with Heartseed and others

## Utilise internal capabilities and disease understanding for stem cell development

## Accelerate innovation through partnerships



- iPSC derived cardiomyocyte spheroids for direct injection into heart
- First human dose expected first half of 2022



- hESC derived dopaminergic progenitor neurons for placing into the brain
- Parkinson's disease
- First human dose expected first half of 2022

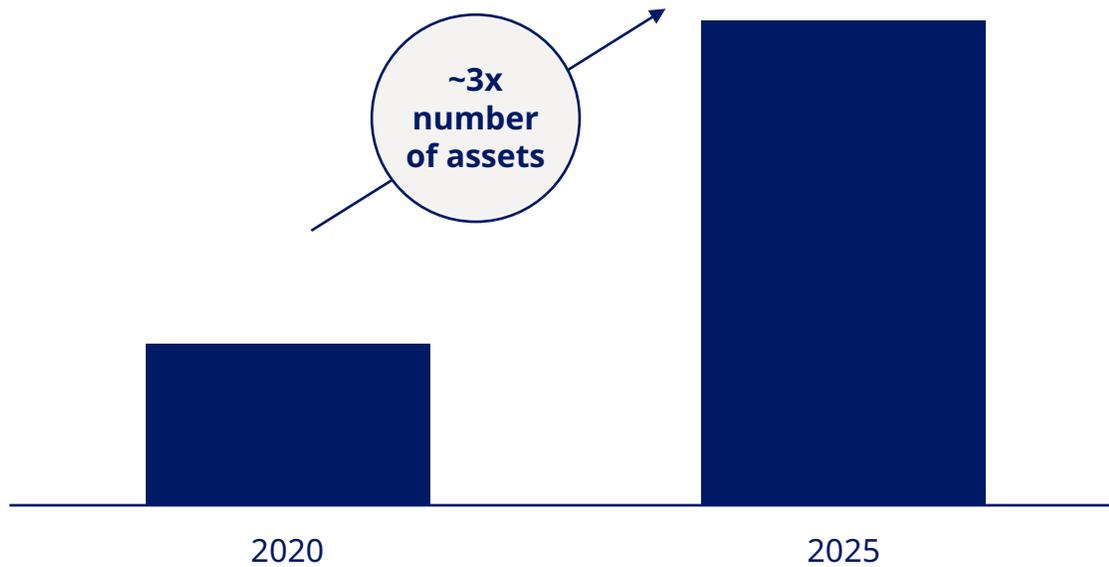


- Novo Nordisk scientists embedded at UCSF lab
- Process development, manufacturing, QA/QC, facilities and operations at Fremont site

# Human data-driven decision-making with faster timelines to enable a robust development pipeline

Speed up time to reach FHD and increase number of phase 1 assets

ILLUSTRATIVE



## Future R&D trends for Novo Nordisk

- More first human doses pursued to enable a robust late-stage pipeline
- Around 3x faster timeline from lead candidate to first human dose
- First human doses with the new technologies, cell-based therapies and RNAi, expected in 2022

# Closing remarks

Building on core capabilities and expanding beyond with new technology platforms

Human data-driven decision-making with faster timelines to enable a robust development pipeline

New platforms with broad application with first human dose for RNAi and stem cells expected in 2022

Expecting 3x increase in first human dose productivity

