# Novel therapies targeting kidney disease

**Non-confidential summary** 



### PIONEERING TRANSFORMATIVE MEDICINES FOR KIDNEY DISEASE

RMC-035 for **kidney protection** in open-heart surgery

- > Phase 2b POINTER study ongoing -> enrolment to be completed in June, results expected year-end 2025
- > Granted FDA Fast Track Designation; eligible for Breakthrough Therapy Designation
- > Clinical proof-of-concept established in Phase 2a AKITA study with 177 patients
  - > 59% reduction vs placebo (MAKE, regulatory endpoint)
- > First-to-market potential; >USD 1 billion market no approved therapies

Additional **opportunities** with RMC-035 & GTX peptides

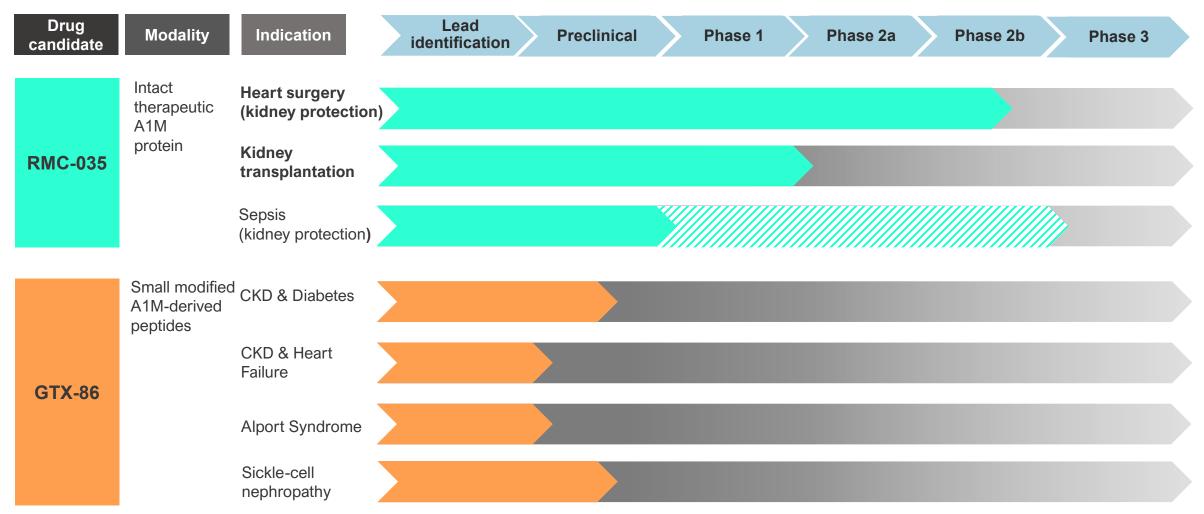
- > Phase 3 ready sepsis program and Phase 2a/b ready kidney transplantation program for >USD 5.6 billion market
- > Unique positioning of preclinical GTX peptides in chronic kidney disease for >USD 8 billion market
- > Listed in Stockholm with top shareholders including Industrifonden and Swedbank Robur [Nasdaq FN Growth Market: GUARD]



### EXPERIENCED MANAGEMENT TEAM WITH STRONG & PROVEN TRACK RECORD IN DRUG DEVELOPMENT

NAME / POSITION **NAME / POSITION EXPERIENCE EXPERIENCE TOBIAS L. AGERVALD** KARIN BOTHA +10 +20 astellas NOVARTIS SmithKline Beecham MD, PhD, CEO MSc, CFO years in industry years in industry GlaxoSmithKline **Fujisawa** AstraZeneca 2 **PETER GILMOUR** +20 **MICHAEL REUSCH** +30 MSc, PhD, CSO/Head MD, CMO of Preclinical years in industry years in industry astellas astellas oncopeptides **Medivir TORBJÖRN LARSSON** SARA THURESSON +15 +30 BSc, Head of CMC MSc, Head of Clinical years in industry years in industry Operations Pharmacia &Upjohn **IQVIA Medivir** 

#### DIFFERENTIATED PIPELINE BASED ON A1M MECHANISM



<sup>\*</sup> Opportunity to initiate pivotal Phase 3 study in sepsis following results in ongoing Phase 2b study (POINTER) in open-heart surgery.

<sup>\*\*</sup> Multiple GTX peptides fulfill criteria for candidate drug nomination. GTX-86 at nomination stage. A1M, alpha-1-microglobulin.

### CHRONIC KIDNEY DISEASE & END-STAGE RENAL DISEASE – A GLOBAL HEALTH CONCERN

#### Acute Kidney Injury (AKI):

- Multiple causes, often resulting from in-hospital complications like severe infections & sepsis and major surgeries (e.g., open-heart surgery, kidney transplantation)
- 50% or more of high-risk open-heart surgery patients develop AKI; addressable patient population ~100,000-120,000 cases per year in the US alone (~30,000 patients with pre-operative CKD)

#### Progression to Chronic Kidney Disease (CKD):

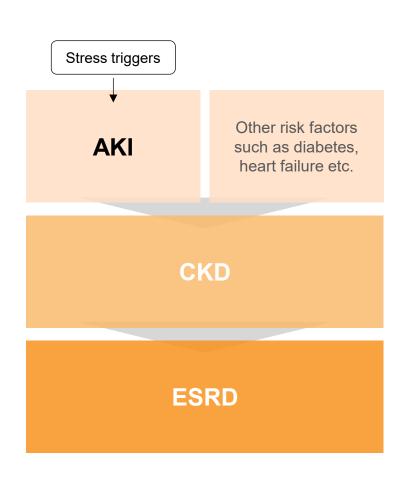
- AKI raises the risk of CKD; 15-20% progress to advanced CKD within 24 months
- CKD leads to severe complications, e.g., cardiovascular disease and kidney failure
- Years of life lost (YLL) from CKD are expected to surpass diabetes by 2040

#### AKI in patients with pre-existing CKD:

- CKD is a strong risk factor for AKI
- AKI in CKD accelerates progression to ESRD high unmet need

#### CKD to End-Stage Renal Disease (ESRD):

- 10-15% of CKD patients advance to ESRD; requires dialysis or kidney transplant
- High mortality rate (15-20%), worse than many cancers
- Represents 7% of Medicare costs but affects 1% of the population



### THERAPEUTIC A1M DELIVERY – A NOVEL PARADIGM WITH CLINICALLY VALIDATED MECHANISM

Harnessing natural properties of alpha-1-microglobulin (A1M) to protect the kidneys

- Endogenous ~22 kDa circulating glycoprotein
  - Liver main source of expression
- Ubiquitous distribution & cellular uptake
- Renal clearance
- Evolutionary conserved house-keeping mechanism:
- Potent dual-action inhibitor of oxidative stress (reductase, radical scavenging)
- Heme binding



3-D structure of A1M protein

## A1M PROTECTS KIDNEY FUNCTION BY TARGETING CRITICAL DISEASE PATHWAYS

Challenges	A1M's Key Actions		Protective Effects	
Oxidative stress damages kidney cells	 Neutralizes Oxidative Stress		Reduces cell injury from ROS and hemolysis	
Hemolysis-induced kidney injury	 Binds & Degrades Free Heme		Prevents cell toxicity from free heme / hemoglobin	
Mitochondrial damage and cell death	 Stabilizes Mitochondria		Protects mitochondrial integrity	
Inflammatory response after ischemia-reperfusion	Prevents Secondary Inflammation		Reduces inflammatory injury and tissue scarring	

Bergwik et al., Front Physiol 2021

# DIFFERENTIATING ATTRIBUTES OF RMC-035 (VS OTHER DRUGS TARGETING ACUTE RENAL PROTECTION)

- Distributes to & activity at primary site of cellular injury
  - Kidney proximal tubules
- Several protective & evolutionary conserved mechanisms
  - Oxidative stress / ischemia & reperfusion injury
  - Heme injury
  - Mitochondrial dysfunction
- Targets cellular events upstream of initial injury a paradigm not previously tested in clinical settings
- Robust & consistent kidney protection in a diverse set of in vivo models & species

### RMC-035 – therapeutic intact A1M

Kidney protection in open-heart surgery

### **COMPLETED PHASE 2a AKITA STUDY**

#### - OUTLINE & OBJECTIVES

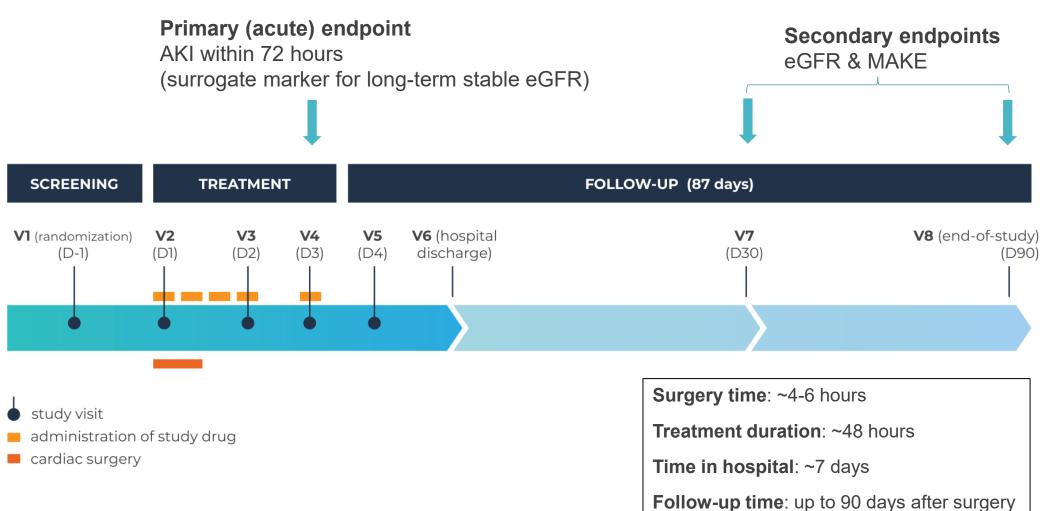


- Recruitment in the US, Canada & Europe
- Double-blind, placebo-controlled (1:1 RMC-035:placebo) in patients undergoing open-heart surgery at increased risk for kidney injury
- 177 patients randomized and dosed
- Main objective: proving efficacy & safety with the maximum possible dose
  - Primary endpoint: acute SCr change meeting AKI criteria, not accepted for regulatory approval
  - Secondary endpoints: Long-term eGFR, accepted for regulatory approval
- Start dose 1.3 mg/kg; reduced to 0.65 mg/kg for patients with low pre-operative renal function
  - Overexposure risks linked to acute SCr increase (tubular overload)

### **COMPLETED PHASE 2a AKITA STUDY**

#### - FLOWCHART





### PHASE 2a RESULTS SUPPORT ROBUST EFFICACY ON HARD KIDNEY ENDPOINTS



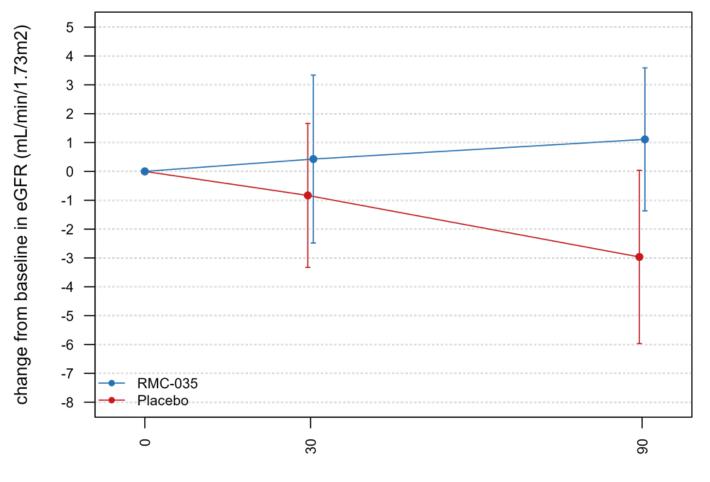
Efficacy stronger than required for regulatory approval based on renal function (eGFR) & Major Adverse Kidney Events (MAKE) on Day 90

- Statistically significant & clinically relevant improvement of renal function (eGFR) vs placebo
  - Improved eGFR vs placebo 4.3 mL/min (full population)
  - Improved eGFR vs placebo 7.9 mL/min (pre-defined subgroup of patients with chronic kidney disease [CKD])
- Reduced proportion of patients with MAKE (i.e., severe loss of kidney function)
  - 59% risk reduction vs placebo for composite endpoint MAKE (death, dialysis or ≥ 25% eGFR loss)
  - FDA recommends MAKE as primary endpoint in Phase 3 20% risk reduction sufficient for approval

**Results support progression to Phase 2b** 

### RMC-035 PREVENTS LOSS OF RENAL FUNCTION AFTER OPEN-HEART SURGERY





#### eGFR difference

4.3 mL/min p=0.06\*

Pre-defined alpha level was 0.1. P-values < 0.1 are statistically significant.

Day

# RMC-035 CONSISTENTLY REDUCES MAKE90 USING VARIOUS THRESHOLDS OF eGFR LOSS



	RMC-035 Evs/PtsRate (90% CI)	<b>Placebo</b> Evs/PtsRate (90% CI)		Risk ratio (90 % CI) p-value
MAKE 90 days (10 % eGFR cutoff)	18/8920.2 (13.2-27.2)	25/8828.4 (20.5-36.3)		0.71 (0.46-1.10) 0.200
MAKE 90 days (15 % eGFR cutoff)	14/89 15.7 (9.4-22.1)	22/8825.0 (17.4-32.6)		0.64 (0.39-1.05) 0.138
MAKE 90 days (20 % eGFR cutoff)	11/89 12.4 (6.6-18.1)	18/8820.5 (13.4-27.5)	•	0.61 (0.35-1.08) 0.150
MAKE 90 days (25 % eGFR cutoff)	6/89 6.7 (2.4-11.1)	14/88 15.9 (9.5-22.3)	<b>•</b>	0.41 (0.19-0.88) 0.047
MAKE 90 days (30 % eGFR cutoff)	4/89 4.5 (0.9-8.1)	14/88 15.9 (9.5-22.3)	•	0.30 (0.13-0.70) 0.010
			0.25 0.5 1 1.5  Favours RMC-035 Favo	──> ours placebo

#### PHASE 2b POINTER STUDY - STATUS UPDATE



- Final optimization step before Phase 3
- ~160 patients (Europe & North America)
- Two RMC-035 dose arms (30 & 60 mg) and Placebo (2:2:3 randomization)
  - 3 infusions during the first 24 h from surgery
- Primary endpoint: change in eGFR from before surgery to Day 90

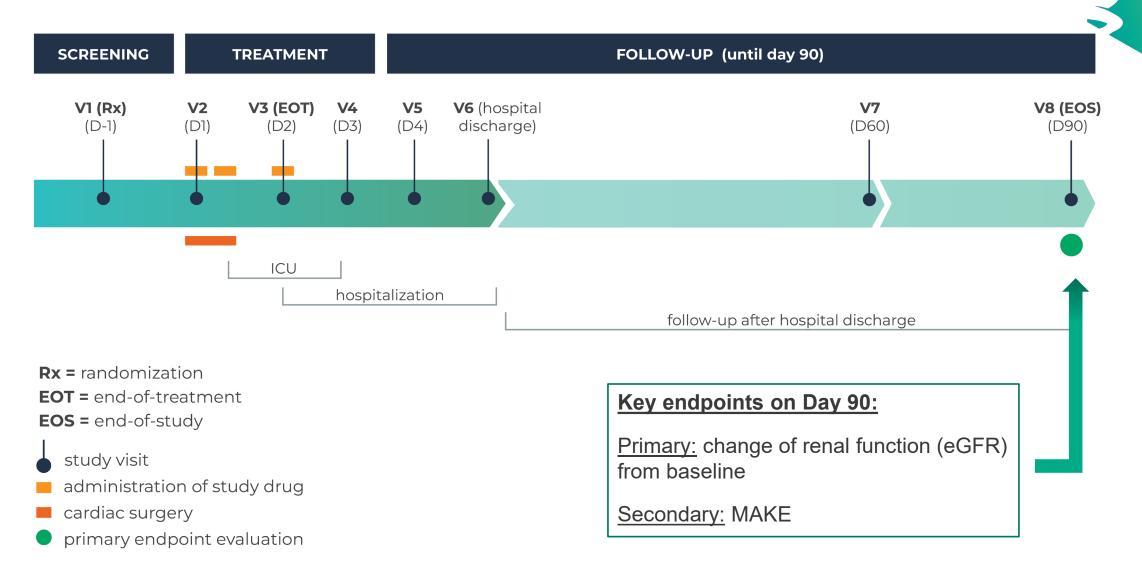
#### Important study milestones

- √ >80% of patients enrolled (April 2025)
- ✓ Positive outcome of first DSMC interim safety review (Q1 2025); 2<sup>nd</sup> review in Q2
- Recruitment to be completed this summer; results year-end 2025

eGFR, estimated glomerular filtration rate; DSMC, data safety monitoring committee

### **ONGOING PHASE 2b POINTER STUDY**

#### - FLOWCHART



#### **CLEAR PATH TOWARDS MARKET APPROVAL FOR RMC-035**

- Fast Track Designation granted by the US FDA
  - Reducing risk for death, dialysis or irreversible loss of kidney function in patients undergoing open-chest cardiac surgery at high risk for acute kidney injury
- Indication eligible for Breakthrough Therapy Designation
- Single pivotal Phase 3 study sufficient to support market approval
  - Primary endpoint MAKE at Day 90 after surgery (~600 patients)
  - Potential for accelerated approval based on interim analysis of eGFR (~300 patients)
  - First-to-market potential
- Phase 3 Expansion Opportunities
  - Sepsis Phase 3 ready and Kidney Transplant Phase 2a/b ready, following successful Phase 2b POINTER results

**Open-heart Surgery** >USD 1 billion Sepsis >USD 5 billion Kidney Transplantation >USD 0.6 billion

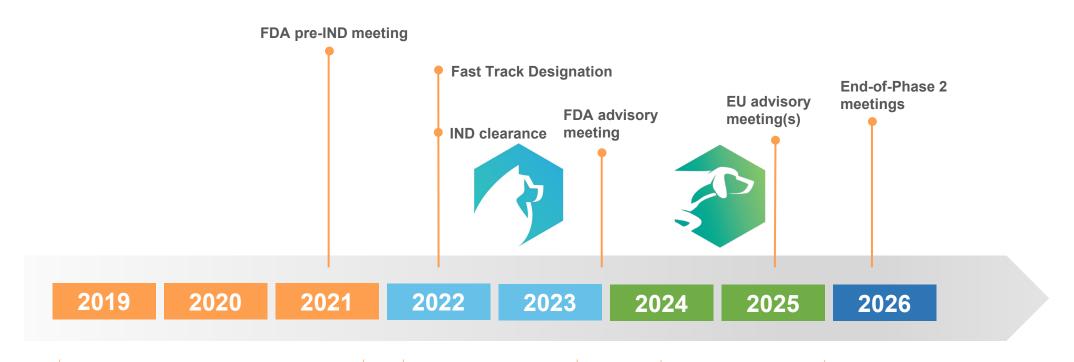
# FIRST-TO-MARKET POTENTIAL WITH NO APPROVED THERAPIES - COMPETITOR LANDSCAPE

COMPANY (DRUG)	PHASE	MODE OF ACTION	POC DATA HEART SURGERY	COMMENT
Guard Therapeutics (RMC-035)	2b	A1M analog	Yes	Ongoing – expected results year-end 2025
Novartis (TIN-816)	2a	Human CD39 enzyme	-	Ongoing – expected results Q3 2025 N=120, acute primary endpoint No efficacy data available
AstraZeneca / Alexion (Ultomiris)	3	Complement 5 inhibitor	-	Ongoing – expected results Q1 2027 N=736, MAKE is primary endpoint No efficacy data available in open-heart surgery
Genentech (GDC-8264)	2	RIP-1 inhibitor	-	Ongoing – expected results Q4 2027 N=404, MAKE is primary endpoint No efficacy data available
AM Pharma (Ilofotase alfa)	2a	ALP analog	-	Ongoing – results expected Q4 2025 N=250, acute primary endpoint No efficacy data available in open-heart surgery
Renibus Therapeutics (RBT-1)	3	Iron sucrose + stannus protoporhyrin	-	Targets acute endpoints like length of hospital stay & hospital readmission rate. Did not show efficacy on renal endpoints in Phase 2a study.

# RECENT PHARMA DEALS IN NEPHROLOGY - TOTAL DEAL VALUE OVER \$11BN 2023-24 YTD

TARGET	ACQUIRER	YEAR	DEAL VALUE	STAGE	LEAD ASSET	INDICATION
Alpine Immune Sciences	Vertex Pharma	2024	\$4.9bn	Phase 2	Povetacicept	IgAN
Human Immunology Biosciences	Biogen	2024	\$1.15bn + milestones	Phase 2	Feltzartamab	IgAN, Primary membranous nephropathy & antibody-mediated rejection
Jnana Tx	Otsuka	2024	\$800m	Preclinical	Panel of solute carrier inhibitors	lon transporter kidney disease
Calliditas	Asahi Kasei	2024	\$1.1bn	Marketed	Tarpeyo (Budesonide)	IgAN
Chinook Tx	Novartis	2023	\$3.5bn	Phase 3	Atrasentan & Zigakibart	IgAN
CinCor Pharma	AstraZeneca	2022	\$1.8bn	Phase 2	Baxdrostat	Treatment-resistant hypertension, primary aldosteronism and CKD
Vifor Pharma	CSL	2021	\$12.3bn	-	Product portfolio in nephrology	-
Sanifit Tx	Vifor Pharma	2021	\$205m + milestones	Phase 3	SNF472	Treatment for calciphylaxis ESRD patients
Corvidia Tx	Novo Nordisk	2020	\$2.1bn	Phase 2	Zilitivekimab	Therapies within CKD segments

#### **KEY MILESTONES & DELIVERY ACCORDING TO PLAN**



#### **Clinical Phase 1 program**

- ✓ ROS-01 (single dose, healthy subjects)
- √ ROS-02 (multiple doses, healthy subjects)
- ✓ ROS-03 (renal impairment study)
- ✓ ROS-04 (safety/PK study in heart surgery)

#### Phase 2a AKITA study

✓ ROS-05 (proof-of-concept, heart surgery)

#### Phase 1b study

✓ ROS-06, kidney transplant

#### Phase 2b *POINTER* study

ROS-07 (dose-finding)

#### Phase 3 study heart surgery

Optional Phase 3 study in sepsis

Optional Phase 2a/b study in kidney transplantation

### GTX platform (A1M-derived peptides)

Treatment of chronic kidney disease (CKD)

#### GTX PEPTIDES – 2<sup>nd</sup> GENERATION A1M DRUGS

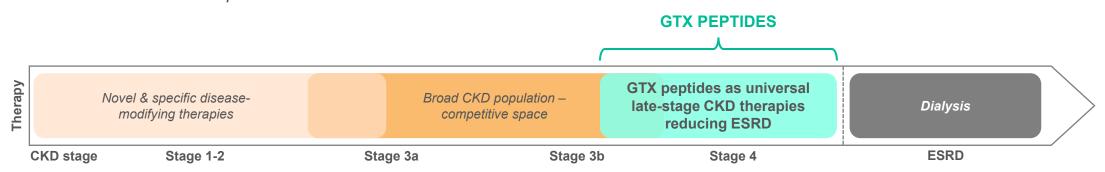
#### **Delivered SC**

Intended as chronic therapy with intermittent dosing (e.g., for CKD)

- Panel of novel A1M-derived peptides with preserved functionality vs native A1M
  - ~15-35 aa, chemical synthesis
- Enables clinically validated A1M mechanism in non-acute settings
- Robust preclinical efficacy across diverse acute and chronic kidney models
- Strong IP, composition of matter until 2044
- Broad clinical development opportunity with unique positioning in CKD
  - High degree of optionality strategy yet to be refined
- Candidate drug nomination pending; transfer into slow-release formulation
- ~2 years to IND

### GTX PEPTIDES (A1M-DERIVED) – MASSIVE OPPORTUNITY IN LATE-STAGE CKD

- High potency and efficacy, comparable to RMC-035
- Broad impact across CKD etiologies, including orphan diseases
  - Demonstrated robust efficacy in a wide range of preclinical disease models
- Unique opportunity in late-stage CKD patients:
  - Highest risk for progression to ESRD
  - Often excluded from clinical trials
  - Current CKD therapies ineffective or contraindicated



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## **Appendix**

### DIFFERENTIATING ATTRIBUTES OF GTX PEPTIDES VS SoC & LATE-STAGE COMPETITORS IN CKD

- Preferential distribution & activity at kidney proximal tubules
  - Enables specific tubular protection
- Evolutionary conserved protective mechanisms common to all CKD patients
  - Oxidative stress / IRI, heme injury, mitochondrial dysfunction
- Does not rely on renal hemodynamic mechanisms for kidney protection
  - Complementary to SoC
  - Potential efficacy & safety benefits
- Offers MoA-driven enrichment of high-risk patients
  - E.g., hematuria & tubulo-interstitial engagement (acute tubular injury is a common feature of progressive CKD)

#### THERAPEUTIC POTENTIAL ACROSS THE SPECTRUM OF CKD

Glomerular dysfunction, podocyte & mesangial activation<sup>1</sup>

Loss of filtration barrier

Inflammatory mediator release & tubular cell injury

Metabolic dysfunction

Pathophysiology Podocyte effacement Mesangial expansion ROS & NOX4 Inflammation

Proteinuria Hematuria Tubular inflammation Fibrosis ROS & NOX4

Metabolic dysfunction ROS & NOX4



1

Maintenance of glomerular structure<sup>2,3</sup>

Antioxidant activity & tubular cell activation<sup>4,5,6</sup>



Stabilization of mitochondrial structure & function, reduced ROS<sup>7,8</sup>

**GTX** intervention

Protection of podocytes / mesangial cells<sup>2,3</sup>

Targeting critical & common disease pathways in late-stage CKD – independent of CKD etiology

ROS, reactive oxygen species; NOX4, nicotinamide adenine dinucleotide phosphate oxidase 4

- 1 Wickman et al 2016. PLoS One. 11(5): e0155255.
- 2 Nääv et al 2015. PLoS One. 0125499
- 3 Wester-Rosenlöf et al 2014. 9(1): e86353.
- 4 Åkerström et al 2019, Antioxidants & Redox Signal. 30(4): 489
- 5 Burmakin et al. 2024 Am J Physiol Renal Physiol. doi: 10.1152/ajprenal.00067.2024
- 6 Study reports with in vitro and in vivo GTX activity on file
- 7 Kristiansson et al. 2020. Int J Mol Sci. 21(6): 5825
- 8 Olsson et al 2013. Antiox & Redox Signal. 18(6): 2017

### GENERIC CKD THERAPIES LARGELY RELY ON HEMODYNAMIC (GLOMERULAR) MECHANISMS

DRUG CLASS	MODE OF ACTION	PRIMARY SITE OF ACTION & KEY MECHANISM FOR SLOWING CKD PROGRESSION
ACE inhibitors	Inhibition of Angiotensin-Converting Enzyme	Systemic; reduction of blood pressure & intra-glomerular pressure via vasodilation
ARBs	Blocking of Angiotensin II Type 1 receptors	Systemic; reduction of blood pressure & intra-glomerular pressure via vasodilation
ERAs	Blocking of Endothelin Type A receptors	Systemic; reduction of blood pressure & intra-glomerular pressure via vasodilation; reduction of inflammation & fibrosis
SGLT2 inhibitors	Inhibition of Sodium-Glucose Co- Transporter 2	Kidney proximal tubules; reduction of intra-glomerular pressure via tubulo-glomerular feedback
AS inhibitors	Inhibition of Aldosterone Synthase	Systemic; reduction of blood pressure & intra-glomerular pressure via vasodilation; reduction of inflammation & fibrosis
ISTs (eg corticosteroids)	Anti-inflammatory, immuno-suppressant based on pleiotropic effects	Systemic; reduction of inflammation & fibrosis via multiple mechanisms

#### Untapped opportunity for specifically targeting tubular kidney compartment

#### **ADDITIONAL OPPORTUNITY FOR RMC-035**

#### - SEPSIS

- Sepsis is leading cause of acute kidney injury (AKI). Multifactorial etiology, kidney cell stress due to reduced perfusion, oxidative stress, endotoxins and inflammation
- RMC-035 efficacious in preclinical sepsis models
- In the US, ~1.7 million patients develop sepsis each year; ~800,000 patients with sepsis develop AKI; and ~250,000 patients develop CKD
- Dosing regimen: once daily up to 5 days; First dose given at sepsis diagnosis (ICU admission)
- Clear regulatory path to market approval Major Adverse Kidney Events (MAKE) at 90 days
- Single confirmatory Phase 3 study sufficient for approval
  - Sample size ~400-600 patients depending on eligibility criteria
  - Recruitment time ~2 years
- Pivotal Phase 3 study in sepsis enabled by Phase 2b POINTER study (heart surgery)
  - Interim analysis with sample size re-estimation to be built in in the absence of preceding efficacy study
  - Should be preceded by a Phase 1b study of approximately 15-20 patients to evaluate exposure & safety

#### **ADDITIONAL OPPORTUNITY FOR RMC-035**

#### KIDNEY TRANSPLANTATION

- Phase 1b study of RMC-035 completed
- Acute kidney graft dysfunction & impaired long-term dysfunction in deceased donor transplantation due to graft ischemia & ischemia-reperfusion injury, and inflammatory / fibrotic response
- Approximately 20,000 deceased donor kidney transplantation performed annually in US eligible for orphan drug designation
- Treatment goal: protect long-term graft function in recipient, avoiding need for re-transplantation
- Dosing regimen: once daily up to 5 days; First dose given intra-operatively to graft recipient
- Clear regulatory path to market approval eGFR at 1 year after transplantation
- Single confirmatory Phase 3 study sufficient for approval
  - Sample size 300-600 patients depending on eligibility criteria
  - Recruitment time 2-3 years
- New formulation considered, may enable higher price point than in open-heart surgery

eGFR, estimated glomerular filtration rate.

### GLOBAL MARKET OPPORTUNITY FOR RMC-035 SUPPORTS BLOCKBUSTER POTENTIAL

- Open-heart surgery: >USD 1 billion (global)
  - 100,000 patients annually in the US (~30,000 with CKD). Total US population ~250,000 patients.
  - Price estimate: USD 5,000 10,000 per patient
  - Total US market potential: USD 0.5 1 billion
- Sepsis: >USD 5 billion (global)
  - ~1.7 million adults in the US develop sepsis each year
  - ~500,000 patients in scope for treatment
  - Total US market potential: USD 2.5 5 billion
- Kidney transplantation: >USD 0.6 billion (global)
  - ~20,000 patients in the US undergoing deceased donor kidney transplantation each year
  - Total US market potential: USD 0.3 0.6 billion (estimated price USD 15,000 30,000 per patient)

### STRONG VALUE PROPOSITION – EFFICACY & COST-BENEFIT PROFILE

#### Robust kidney protection in AKITA study



~5 x greater eGFR effect than one year of standard-of-care CKD treatment



3 x greater risk reduction of MAKE than required for FDA approval

### **Strong evidence for eGFR in Cost Effectiveness Models**



Value dossier supported by available health economic data in patients with CKD

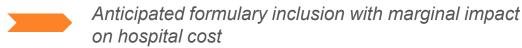
#### **Short-term therapeutic benefit**

(AKI, dialysis, length of hospital stay & re-admission)



Acute benefits offer direct & indirect hospital savings

#### **Attractive cost-benefit profile**



Fulfils NTAP criteria

Value dossier based on HEOR & available Cost Effectiveness Models in AKI & CKD



Cost Effectiveness Analysis: quality-adjusted life years (QALYs)

Budget Impact Model & Budget Analysis Tool