DiaMedica THERAPEUTICS

Corporate Presentation

September 2019

Nasdaq: DMAC

FORWARD LOOKING STATEMENT

This presentation contains forward-looking statements within the meaning of the U.S. Private Securities Litigation Reform Act of 1995, which reflect the Company's current expectation regarding future events. The words “estimate”, “believe”, “anticipate”, “intend”, “expect”, “future,” “plan”, “will,” “may” or “should”, the negative of these words or such variations thereon or comparable terminology and the use of future dates are intended to identify forward-looking statements. The forward-looking statements in this presentation include statements regarding the anticipated clinical success and benefits of DM199 as a potential treatment for chronic kidney disease (CKD), the timing of the Company’s clinical programs, including an anticipated Phase II study starting in the second half of 2019 in patients with CKD, and identification of a dose range which the Company believes will restore normal KLK1 levels in CKD patients. Forward-looking statements involve risks and uncertainties that may cause actual results, events, or developments to be materially different from any future results, events, or developments expressed or implied by such forward-looking statements. These risks and uncertainties include, but are not limited to, DiaMedica’s plans to develop, obtain regulatory approval for and commercialize its DM199 product candidate for the treatment of CKD and its expectations regarding the benefits of DM199; DiaMedica’s ability to conduct successful clinical testing of DM199 for CKD; the perceived benefits of DM199 over existing treatment options for CKD; ability to obtain required regulatory approvals of DM199 for CKD; the potential size of the markets for DM199 and the Company’s ability to serve those markets; the success, cost and timing of planned clinical trials, as well as reliance on collaboration with third parties to conduct clinical trials; its ability to obtain funding for its operations, including funding necessary to complete planned clinical trials and obtain regulatory approvals for DM199 for CKD, and the risks identified under the heading “Risk Factors” in DiaMedica’s annual report on Form 10-K for the fiscal year ended December 31, 2018 filed with the U.S. Securities and Exchange Commission (SEC) and subsequent SEC filings. Except as required by applicable securities laws, DiaMedica undertakes no obligation to publicly update or revise any forward-looking statements, whether as a result of existing or new information, future events, or otherwise.

DIAMEDICA THERAPEUTICS - OVERVIEW

KIDNEY & STROKE TREATMENT OPTIONS	Clinical stage biotechnology company targeting kidney and stroke markets
KLK1 IS A NATURAL PROTEIN	KLK1 protein is naturally produced by the body Low KLK1 levels associated with chronic kidney disease and stroke patients
CLINICAL PROOF OF PRINCIPLE	Millions treated in Japan & China (KLK1 derived from human urine & porcine pancreas) Indications: kidney diseases, stroke, retinopathy, hypertension & related Demonstrated efficacy & excellent safety profile
DM199: THE 1ST RECOMBINANT KLK1	DM199 functionally equivalent to human urine and porcine and forms of KLK1 Superior pharmacokinetics and excellent safety profile Early signals in mechanism biomarkers (NO, PGE_2), kidney function (eGFR) & urinary albumin (UACR)
DE-RISKED DEVELOPMENT PATH	Biobetter development path Produced more reliably and economically with potential to improve efficacy for worldwide use Human clinical trials of DM199 have shown bioequivalence, superior PK profile & excellent safety

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DM199 PROTEIN REPLACEMENT THERAPY PIPELINE

Diverse pipeline of indications

PROGRAM	THERAPEUTIC INDICATIONS	DEVELOPMENT STAGE AND ANTICIPATED MILESTONES				
		PRE-CLINICAL	PHASE I	PHASE II	PHASE III	Anticipated Milestones
DM199 KIDNEY DISEASE	**IgA Nephropathy (IgAN)**					Phase II initiation in 2H 2019
	African Americans with CKD (APOL1)					Phase II initiation in 2H 2019
	Type 1 Diabetes or Lupus Nephritis					Planning for Phase II
DM199 STROKE	**Acute Ischemic Stroke**			***Remedy Study***		Q4 2019 – Q1 2020

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POTENTIAL THERAPEUTIC BENEFITS OF DM199: PROTEIN REPLACEMENT THERAPY

Promoting homeostasis: improving blood flow and reducing inflammation throughout the body

DM199 (rKLK1)

Chronic Kidney Disease

- ↑ renal function
- ↑ vasodilation
- ↑ renal blood flow
- ↓ inflammation
- ↓ oxidative stress

Acute Ischemic Stroke

- ↓ ischemic damage
- ↑ vasodilation
- ↑ cerebral blood flow
- ↓ inflammation
- ↑ neurovascular coupling

Current Clinical Focus

Retinopathy

- ↓ retinal damage
- ↓ VEGF in eyes
- ↑ visual acuity
- ↓ inflammation

Hypertension

- ↑ blood pressure control
- ↑ vasodilation

Autoimmune

- suppresses autoimmune
- ↑ Tregs, CD4, CD25, Fox3, TGF-b1
- ↑ Beta cells

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DM199: RESTORING NITRIC OXIDE (NO) AND PROSTAGLANDIN (PGE_2, PGI_2) SIGNALING PATHWAYS

Nitric Oxide (NO) and Prostaglandins (PGE_2, PGI_2) are key physiological regulators of vital systems including kidneys and brain

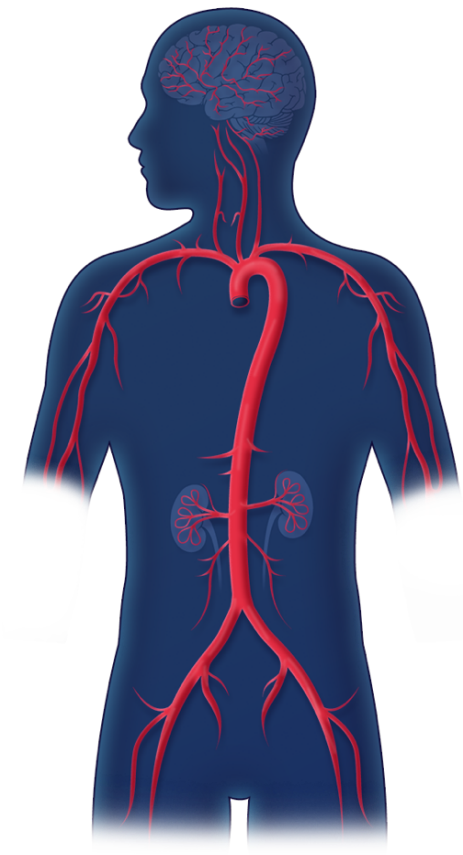
NO and prostaglandins (PGE_2, PGI_2) signaling plays critical role in whole body homeostasis

Low levels of KLK1, BK, NO, cGMP, PGE_2, PGI_2, and cAMP associated with kidney disease, cardiovascular and cardiovascular diseases

KLK1 restoration therapy increases levels of NO-cGMP & PGI_2-cAMP which work synergistically[1] to:

- Improve blood flow
- Reduce inflammation, fibrosis and oxidative stress

NO and PGI_2 research both awarded Nobel Prizes in Physiology & Medicine



[1]Exp Physiol 93.1 pp 141–147 and Arteriosclerosis and Thrombosis Vol 11, No 2 March/April 1991

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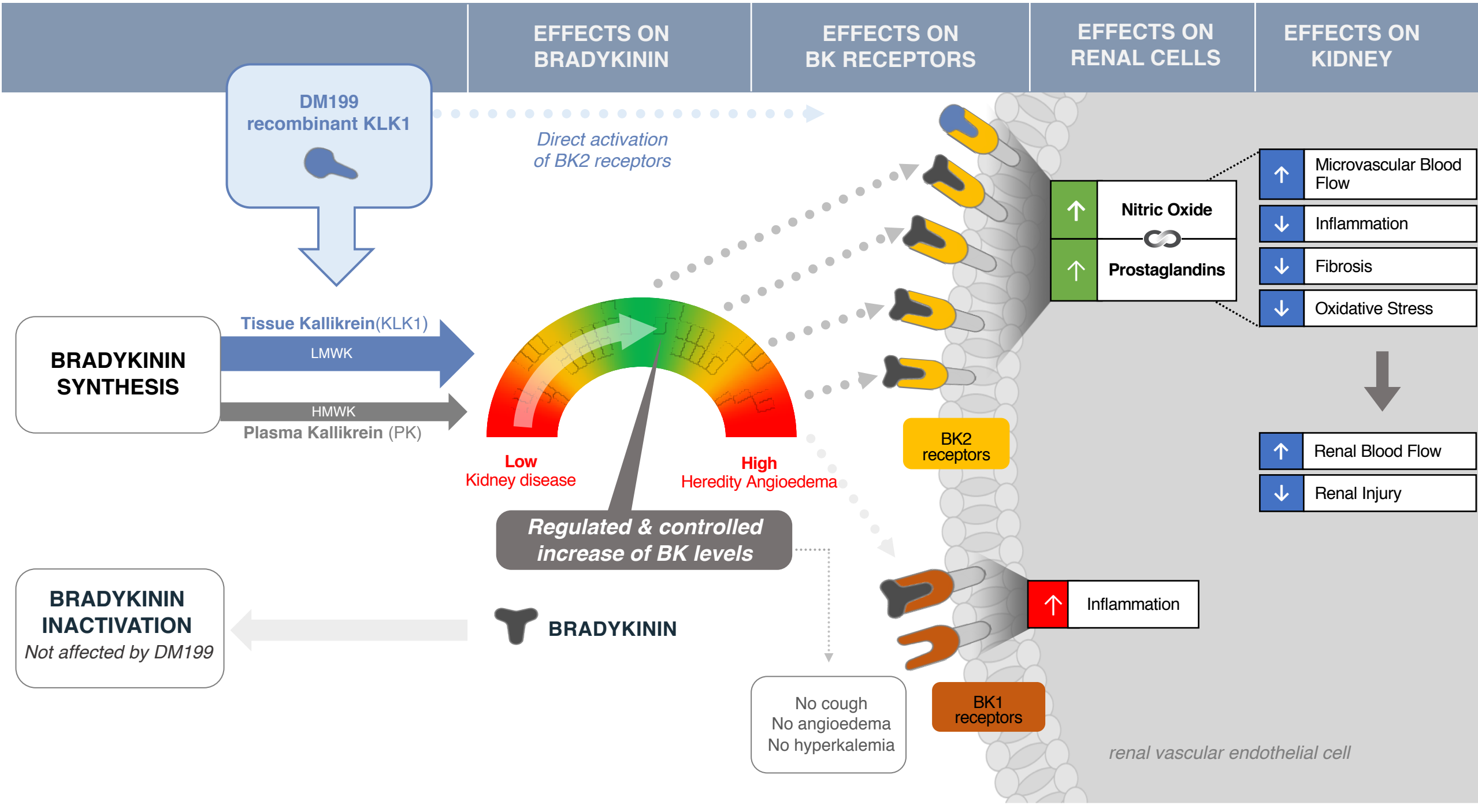
DM199 MECHANISM OF ACTION

DM199 boosts KLK1 levels enabling release of physiological levels of BK when and where needed. Generating beneficial nitric oxide, prostacyclin and anti-inflammatory mediators



DM199 to increase low levels of KLK1, BK, NO, PGI_2, cGMP and cAMP in patients with CKD

LMWK - low molecular weight kininogen
HMWK - high molecular weight kininogen

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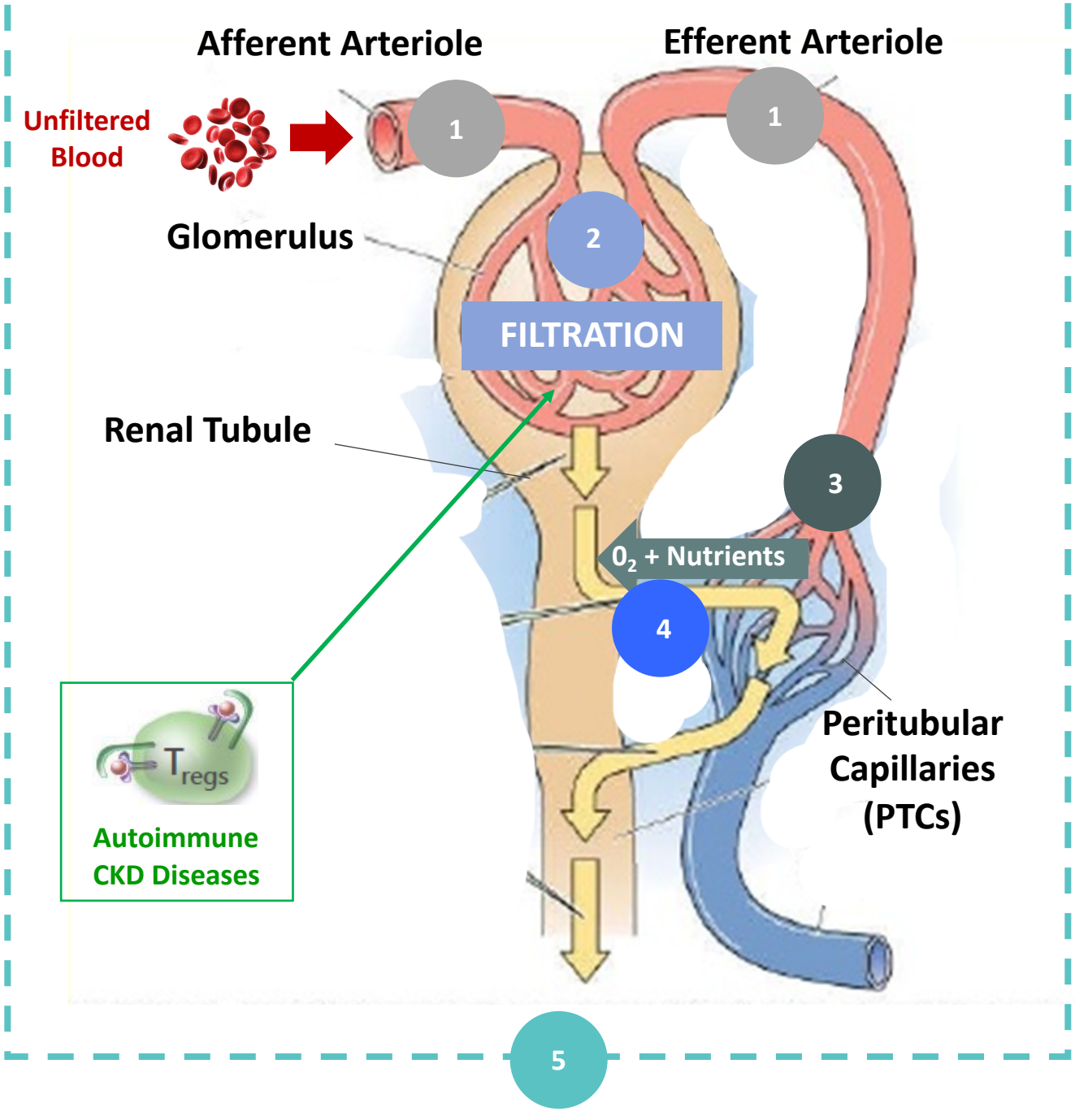
POTENTIAL EFFECT OF DM199 ON KIDNEY FUNCTION

DM199 Improves Kidney Function By Regulating Multiple Interrelated Mechanisms



Potential Benefits of DM199

1

Blood flow regulation
- Increase afferent and efferent arterioles
- Increase micovascularization
- Increase glomerular filtration rate (GFR)
- Increases oxygen and supply of nutrients to peritubular capillaries (PTCs)

2

Improve glomerular function
- Reduce inflammation, oxidative stress, and fibrosis
- Inhibit mesangial cell proliferation
- Increase T-Regs (autoimmune CKD diseases)
- Prevent or reduce thickening of basement membrane

3 **Promote release of nitric oxide**

4 **Regulate ENaC –** modulate sodium reabsorption or excretion

5 **Reduce inflammation, oxidative stress and fibrosis throughout the nephron**

Unique Mechanism of DM199 hypothesized to drive improvements in both eGFR & UACR

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DM199: FIRST RECOMBINANT (SYNTHETIC) KLK1 PROTEIN

PRODUCT	DM199	KALLIDINOGENASE	KAILIKANG®
Company	DiaMedica THERAPEUTICS	BAYER, SKK & others	SPH 上海医药 SHANGHAI PHARMA[1], 天普藥業 TECHPOOL
Source	**Recombinant KLK1**	**Porcine KLK1**	**Human Urinary KLK1**
Indications	Chronic kidney disease & Acute ischemic stroke	Chronic kidney disease, retinopathy & hypertension	Acute ischemic stroke
Markets	Worldwide	Japan, China & Korea	China
Treated patients	200+ participants	**Millions patients treated[2]**	**Half million+ patients treated[2]**

[1] Shanghai Pharma acquired Techpool BioPharma, May 23 2018 at USD$550M valuation

SYNTHETIC ADVANTAGES

REGULATION
WORLDWIDE USE

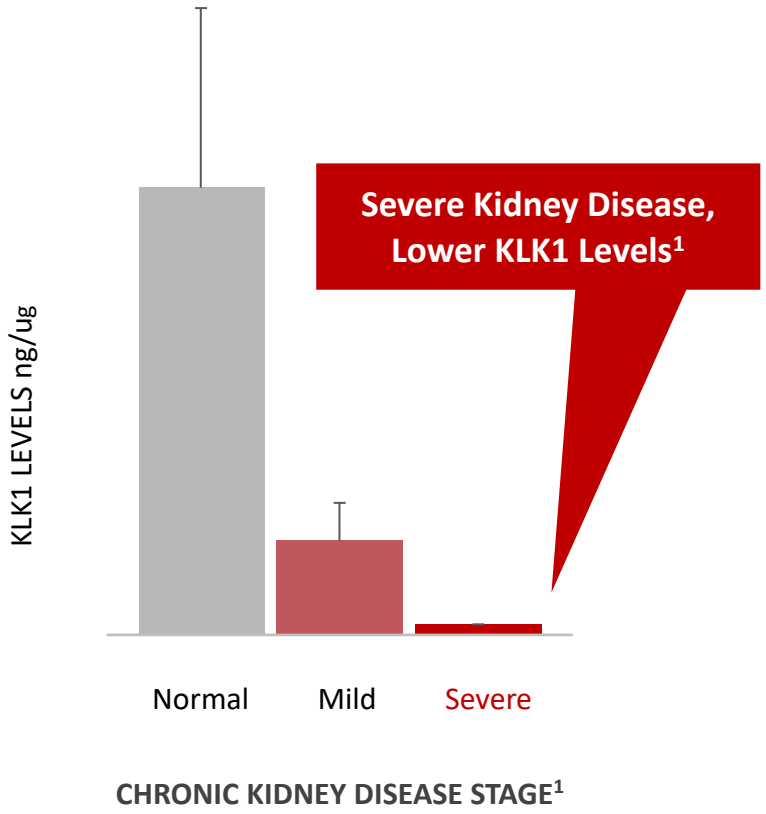
REDUCE RISK PROFILE OF IMMUNOGENICITY , ENDOTOXINS & IMPURITIES

IMPROVE EFFICACY
WITH OPTIMIZED DRUG LEVELS & DOSING CONVIENCE OF SUBCUTANOUS DELIVERY

[2] Estimated using IQVIA, Transl. Stroke Res., March 6, 2017 and DiaMedica analysis.

KLK1 DEFICIENCY ASSOCIATED WITH CKD, CARDIOVASCULAR DISEASES AND STROKE

Lower KLK1 levels found in patients with chronic kidney disease, stroke and related



References	Disease
Perez-Blanco et al. Clin. Neph. 47:65 1997	CKD
Naicker et al. Immunopharm. 44:183, 1999	CKD
Chiang et al. Nephrology 13: 198, 2008	CKD
Yu et al. Kidney Int. 61:1030, 2002	CKD/ hypertension
Azizi et al. J. Clin. Invest. 115:780, 2005	CKD/hypertension
Margolius et al. Circulation Res. 35:820, 1974	Hypertension
Levy et al. J. Clin. Invest. 60:129, 1977	Hypertension
Zhang et al., Ann Neurol. 70:265, 2011	Stroke

[1] Immunopharmacology 44 1999. 183–192.

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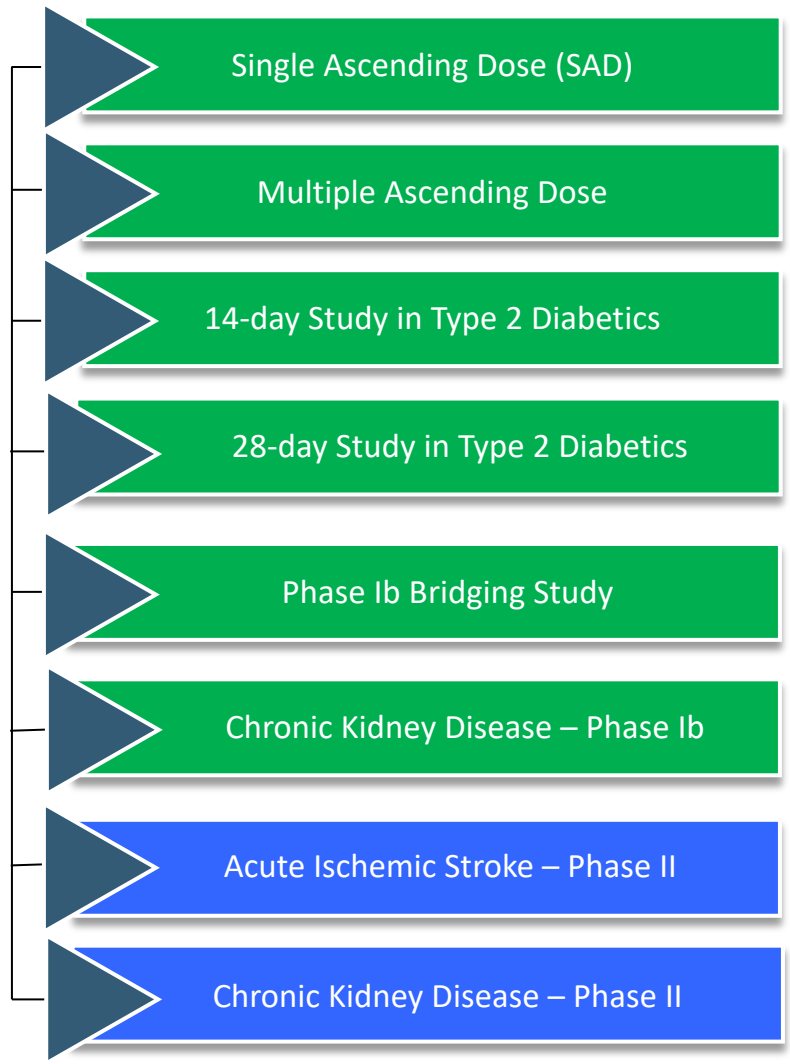
DM199: SAFE & WELL TOLERATED

Well-tolerated in multiple previous and ongoing clinical studies in 200+ participants

- No serious adverse events (drug related)
- Adverse events mostly mild in intensity, primarily related to injection site reactions
  - Dose limiting tolerability - orthostatic hypotension @50 µg/kg - *10x higher than anticipated treatment levels*



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DM199 FOR CHRONIC KIDNEY DISEASE

IGA Nephropathy (IgAN)

Overview

- Cause: IgA, a protein meant to defend the body against foreign invaders, accumulates in the kidneys, attacking glomeruli
- Diagnosis: Hematuria, albuminuria, hypertension
- Prognosis: up to 50% at risk for ESRD within 10-20 years

Prevalence

- ~140,000 in US / ~200,000 in EU (rare disease)
- ~2 million in China

Rationale

- DM199 improve blood flow, reduce inflammation and related
- DM199 also increases Tregs and improves autoimmunity in T1D model, could potentially address the underlying autoimmune problems of IgAN and improving kidney function[1]
- No approved therapies; only treatments for symptoms

CKD in African Americans

Overview

- African Americans 3-4x more likely to suffer kidney failure than Caucasians
- APOL1 gene variations are 2x more likely to progress to ESRD
- CKD shortens life expectancy by 5-11 years

Prevalence

- ~7M African Americans with CKD in US
- ~15% African Americans with APOL1 gene variations

Rationale

- DM199 improve blood flow, reduce inflammation and related
- African Americans exhibit lower KLK1 levels and renal blood flow
- African Americans are more highly salt sensitive
  - KLK1 more effective in salt-sensitive *in vivo* models
- No approved therapies

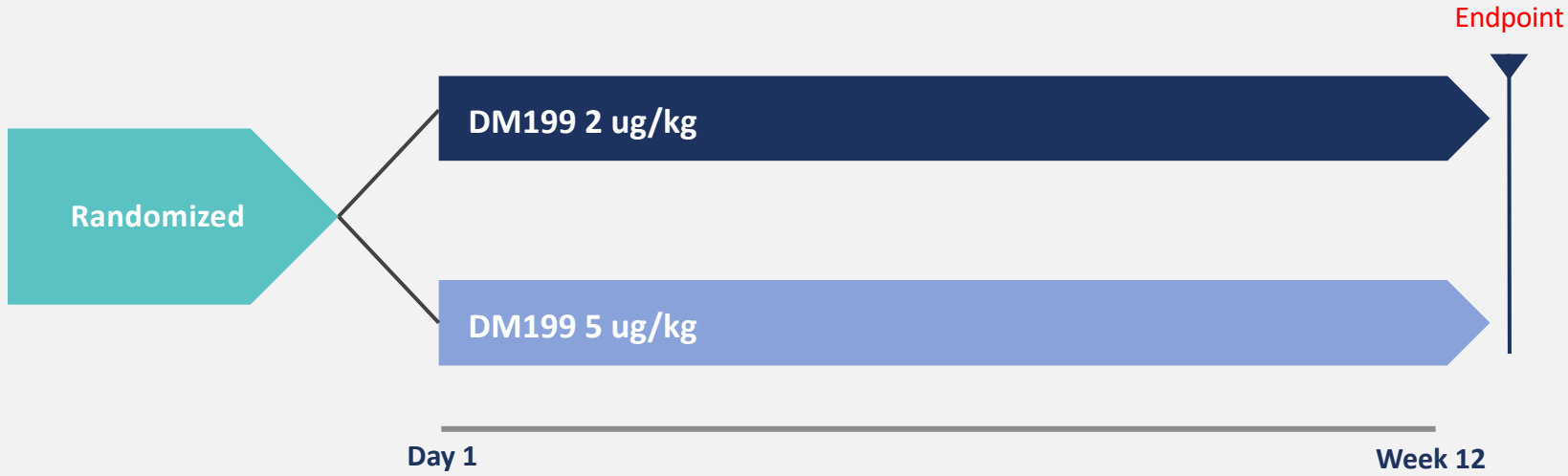
[1] Eur Rev Med Pharmacol Sci 2015; 19 (2): 284-288

DM199 PHASE II CKD TRIAL FOR IGA NEPHROPATHY AND AFRICAN AMERICANS WITH CKD

Targeting multiple rare / unmet forms of chronic kidney diseases – Initiating Fall 2019

Phase II, Multi-Center US, Randomized Study

- IgAN & hypertensive African Americans with CKD cohorts
- ~30 participants per cohort
- 12-week treatment
- Eligibility criteria
  - eGFR 30-90 mL/min
  - Age 18-70
- SC dosing, 2x week
- ~10 sites



Study endpoints at week 12:

- Safety, Tolerability, PK and PD
- eGFR, Albumin to creatinine ratio (UACR), blood pressure and others

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DM199 CKD PHASE Ib CLINICAL STUDY

DM199 Well-Tolerated with Encouraging Early Signals in Mechanism Biomarkers, eGFR, and UACR

Enrolled 32 patients with CKD, single dose

- 24 moderate & 8 severe CKD subjects
- 3 dose levels

Well-tolerated with no apparent safety signals

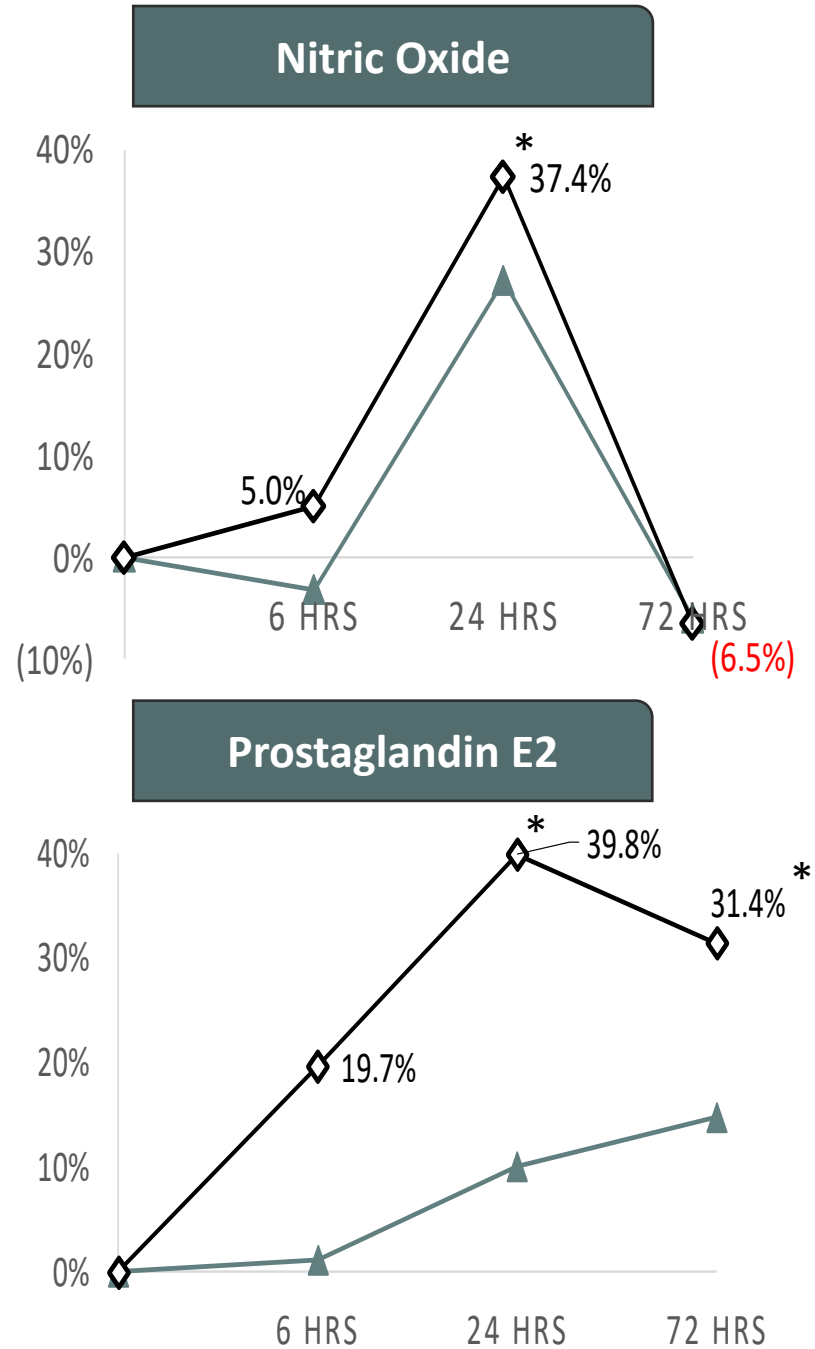
- No dose-limiting toxicities identified
- No discontinuations or serious adverse events

Displayed well-behaved PK profile

- Dose-proportional serum drug exposure levels
- Consistent with previous non-CKD studies

Observed encouraging early signals in mechanism biomarkers and eGFR and UACR

- Peak changes occurred at 24 hours after dosing for NO, PGE2, eGFR, and UACR



◇ **Mean**

▲ **Median**

* P = <0.05, t-test

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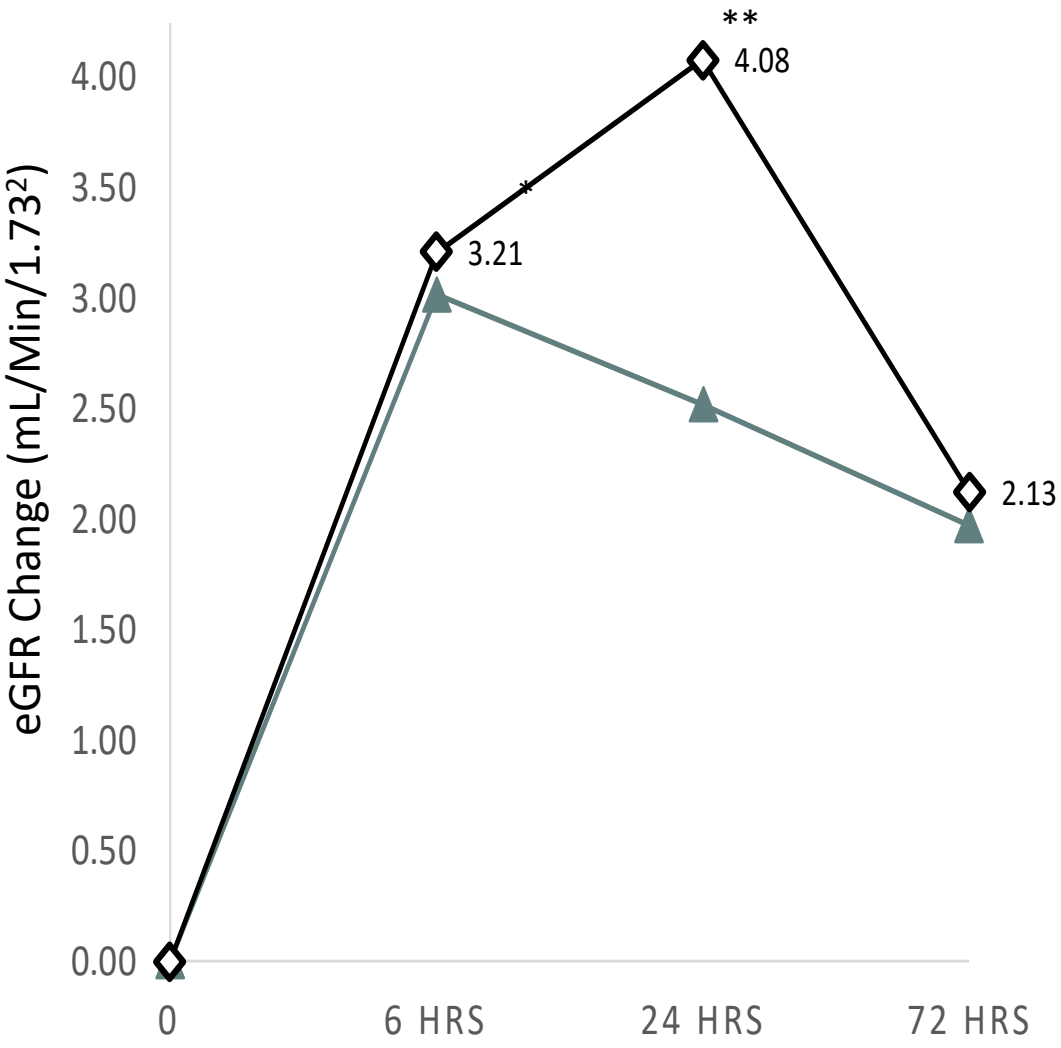
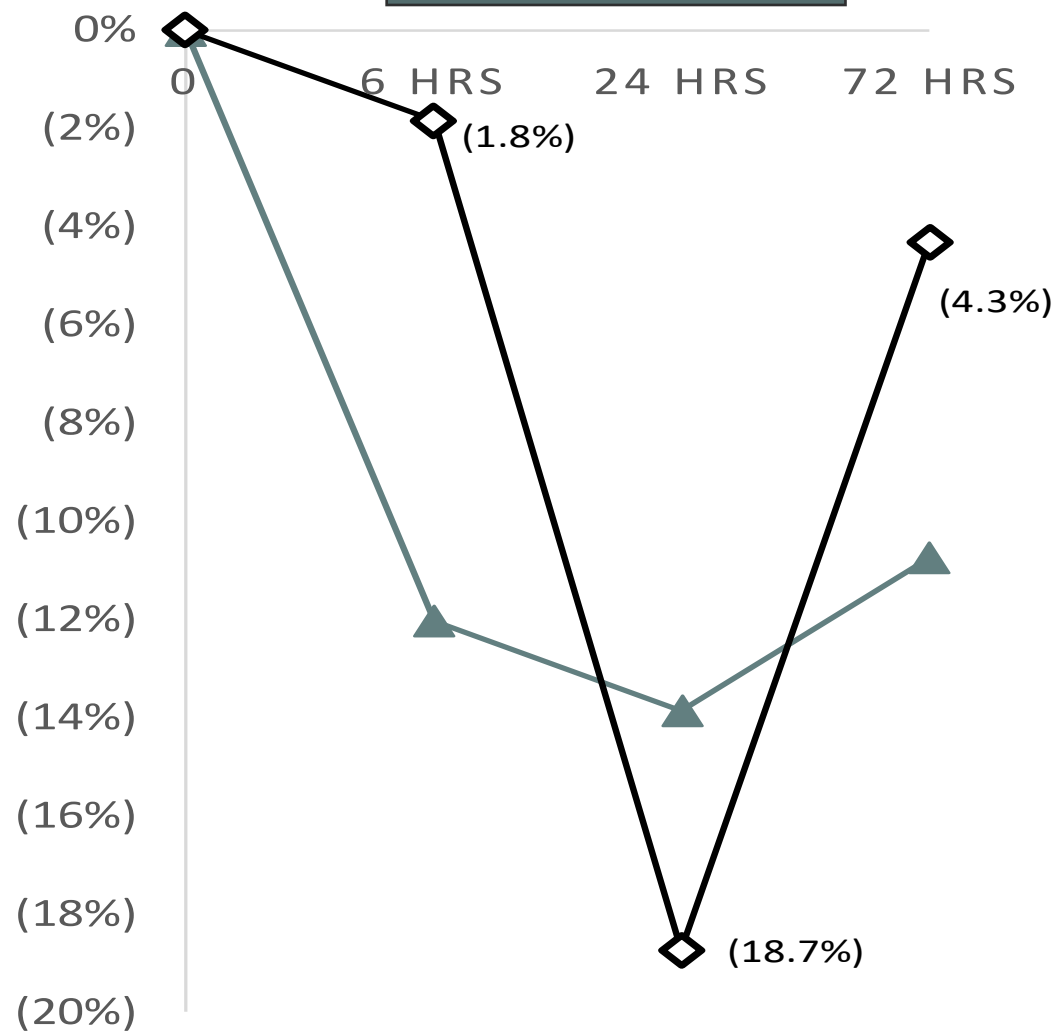
DM199 CKD PHASE 1B eGFR AND UACR RESULTS – EARLY SIGNALS

Estimated glomerular filtration rate (eGFR) – measure of kidney function

eGFR (N=28)



UACR (N=16)[1]



◇ **Mean**

▲ **Median**

* P = <0.05, t-test

** P = <0.01, t-test

[1] Excludes participants with normal baseline UACR levels (<30)

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KLK1 (PORCINE) DATA IN PATIENTS HIGHLIGHTS THE POTENTIAL FOR IMPROVING CKD IN PATIENTS

30+ clinical studies with KLK1 (porcine) demonstrated improvement in eGFR and albuminuria

Meta analysis – KLK1 (porcine) for CKD[1]

". . . clinical efficacy of pancreatic KLK1 in treating kidney disease is significant and worthy of wide application."

Clinical Efficacy of Pancreatic Kininogenase in the Treatment of Diabetic Nephropathy: A Systematic Evaluation

By: Xiaozheng Chen, Xi Chen, Jianmin He

(Internal Medicine Dept., Shaoguan Railawy Hospital, Shaoguan city, Guangdong 512023, China)

ABSTRACT

Objective: To evaluate the clinical efficacy of pancreatic kininogenase in the treatment of diabetic nephropathy.

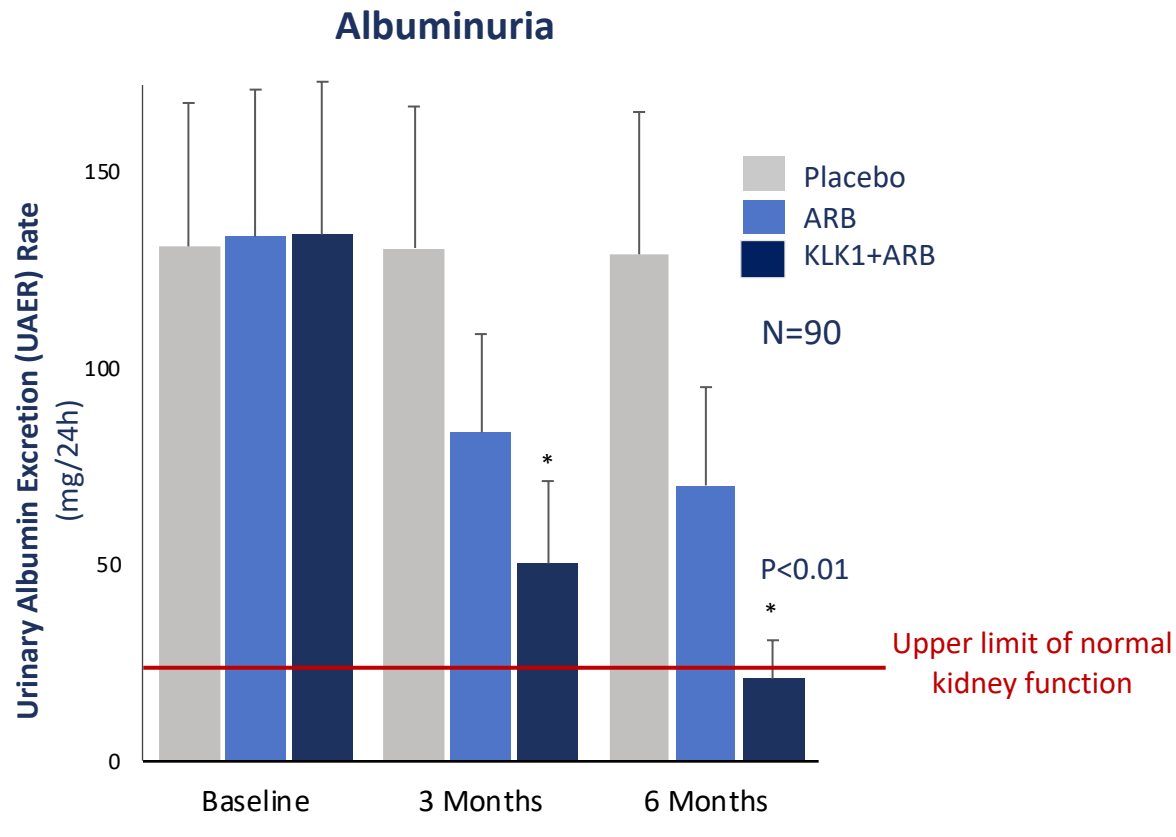
Methods: The methodology were evaluated based on references in the recent 20 years from PubMed, Science Direct, EBSCO host, EMBASE, the Cochrane Library, CNKI, CECDB CQVIP. The researchers performed rigorous evaluation on the quality of the included studies and extracted data. Review Manager 5.0 Software was applied to evaluated the qualified randomized controlled tirals (RCTs).

Results: 12 RCTs were included, involving 762 patients (389 cases in the treatment group and 373 cases in the control group)/ Compared to angiotensin II receptor antagonist (ARB), angiotensin converting enzyme inhibitors (ACEI), alprostadil, pancreatic kininogenase can significantly reduce the urinary albumin excretion rate in the treatment of diabetic nephropathy, thus postponing the pathological process of diabetic nephropathy.

Conclusion: Kininogenase has significant curative effect in the treatment of diabetic nephropathy and is worthy of promotion.

KLK1 (porcine) + ARB treatment for 6 months[2]

UAER improved at 3 and 6 months (84%)



[1] Hainan Medical Journal, 2014-01

[2] Chin J Diabetes, August 2011, Vol 19, No 8.

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SIGNIFICANT UNMET NEED IN STROKE

Stroke is a Devastating Condition in Great Need of Treatment Options

Acute Ischemic Stroke (AIS)

- **Blockage of blood flow in brain**
  - ~87% of all stroke cases are AIS
  - 2nd leading cause of death in developed countries
  - Affects 1 in 6 people in their lifetime
  - Average age of first stroke is 65 years
    - Risk doubles each decade after 55

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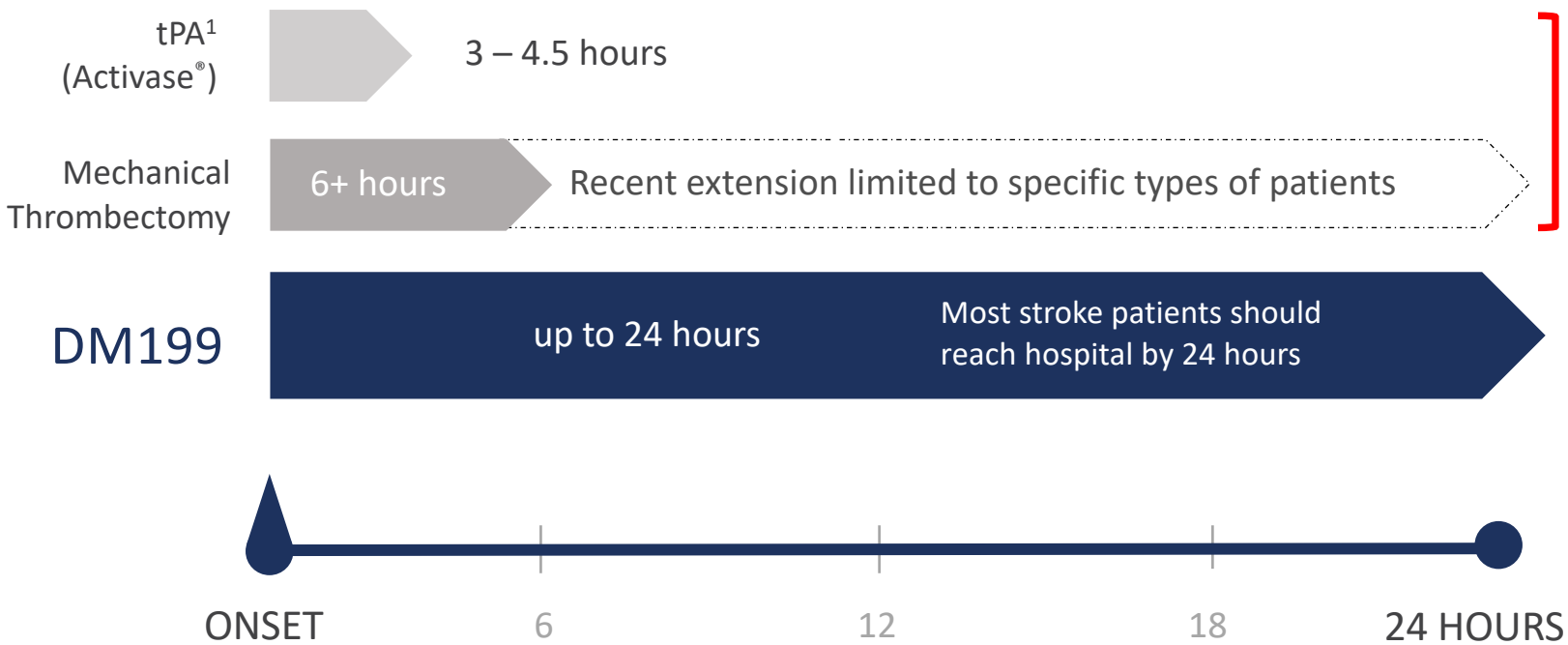
ACUTE ISCHEMIC STROKE (AIS)

DM199 has Potential to Provide Treatment Option for Almost all Stroke Patients

Stroke Treatment Window



Less than 10% of stroke patients treated

Potential frontline therapy if DM199 proven safe in hemorrhagic stroke patients

[1] tPA (Tissue Plasminogen Activator).

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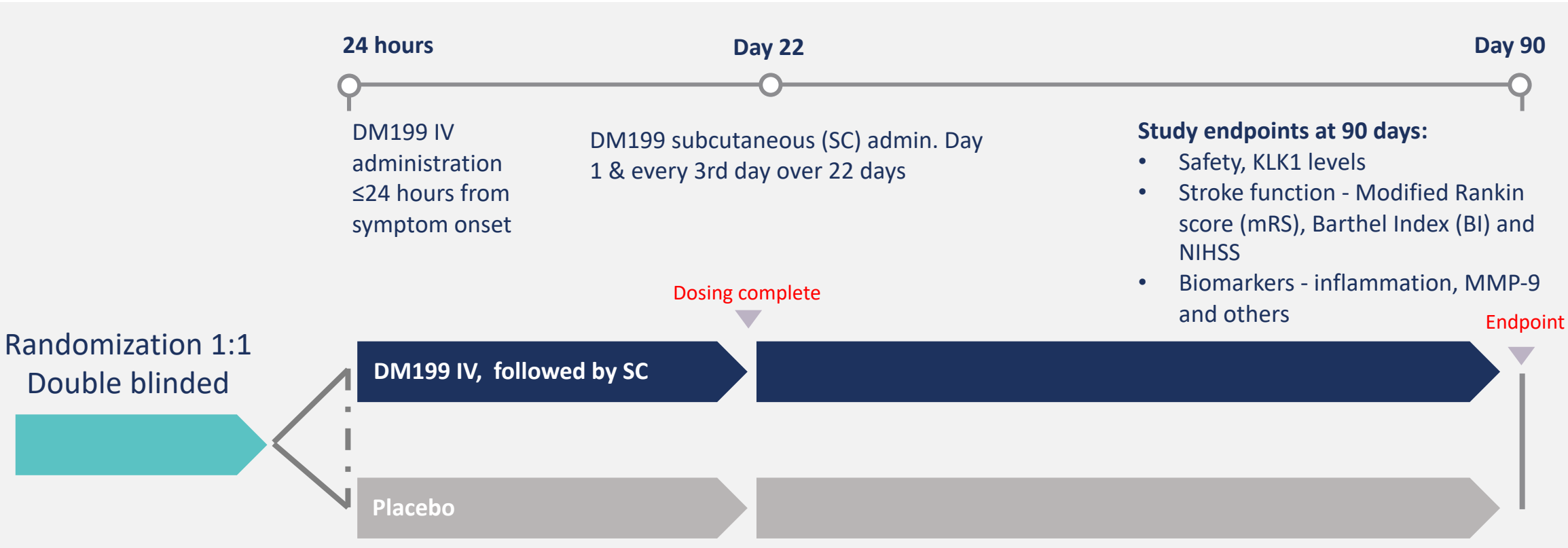
DM199 REMEDY TRIAL:
PHASE 2 ACUTE ISCHEMIC STROKE STUDY

Phase II – first dose IV within 24 hours of stroke followed by 22-days SC treatment

- Up to 100 patients
- Mild-moderate stoke severity (NIHSS score 6 to 25) at treatment
- Endpoints - standard stroke endpoints and anticipate same protocol design for phase III



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KAILIKANG® (URINARY KLK1) DATA IN PATIENTS POST STROKE HIGHLIGHTS THE POTENTIAL TO IMPROVE PATIENT OUTCOMES

50+ clinical studies with Kailikang® (urinary KLK1) demonstrated efficacy in multiple stroke endpoints (mRS, BI, NIHSS stroke scales), increased blood flow & reduced inflammation (CRP)

Meta analysis - Kailikang® (urinary KLK1) Reduces Neurological Impairment after AIS & Improves Long-Term Outcomes[1]

Journal of Evidence-Based Medicine ISSN 1756-5391

REVIEW

Efficacy and safety of human urinary kallidinogenase injection for acute ischemic stroke: A systematic review

Canfei Zhang, Wendan Tao, Ming Liu and Deren Wang

Department of Neurology, West China Hospital, Sichuan University, Chengdu 610041, China

Keywords
human urinary kallidinogenase; randomized controlled trials; systematic review; acute ischemic stroke

Correspondence
Ming Liu, Department of Neurology, West China Hospital, Sichuan University, No. 37 Guo Xue Xiang, Chengdu 610041,China
E-mail: wypinh@hotmail.com

Received 8 September 2011; accepted for publication 26 December 2012.

doi: 10.1111/j.1756-5391.2012.01167.x

Abstract

Objective: To assess the efficacy and safety of human urinary kallidinogenase injection (HUK) in treating patients with acute ischemic stroke.

Methods: We searched the Chinese Stroke Trials Register, the Cochrane Stroke Group Trials Register, CENTRAL, Medline, EMBASE, the China Biological Medicine Database(CBM), and the China National Knowledge Infrastructure (CNKI), which were all last searched October 2010.

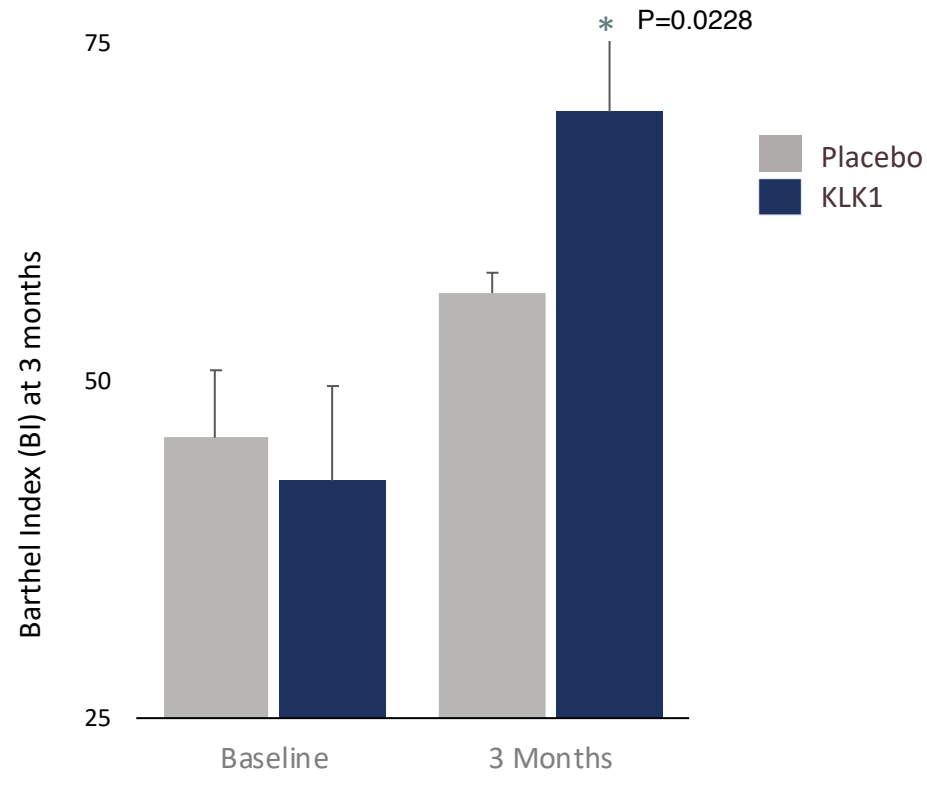
Randomized controlled trials (RCTs) about HUK for patients with acute ischemic stroke were included. The quality of each trial was assessed using the Cochrane Reviewers' Handbook 5.0.2.

Results: Twenty-four trials involving 2433 patients were included. Only two trials reported death or dependence at the end of three months follow up. In those trials, HUK reduced death or dependency comparing to the control group (relative ratio (RR) = 0.69, 95% CI 0.55 to 0.86). Twenty trials (2117 patients) reported the proportion of patients with marked neurological improvement after treatment. Meta analysis showed the HUK-treated group had more neurological improvement than did the control group (RR = 1.56, 95% CI 1.44 to 1.70). Fifteen trials reported

Conclusion

Based on the available evidence, HUK appears to ameliorate neurological deficits for patients with acute ischemic stroke and to improve long-term outcomes, though a few treated patients suffered from transient hypotension. Further high-quality, large-scale randomized trials are needed to confirm these results. Future trials should completely abide by the recommendations of the CONSORT statement, use rigorous methodology, and use a functional outcome as the primary outcome measured during long-term follow up.

Kailikang® (urinary KLK1) Phase III, 446 Patients Treatment Initiated Within 48 hours of Stroke Significantly Improved Post Stroke Function[2]



[1]Journal of Evidence-Based Medicine (2012) 5: 31-39.
[2] Chin J Neurol, May 2007, Vol 40, No 5.

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MULTI-LAYERED INTELLECTUAL PROPERTY POSITION AND MANUFACTURING

At least five other Companies have been unsuccessful developing synthetic KLK1

Manufacturing

- **DiaMedica solved manufacturing challenges in KLK1 protein manufacturing**
  - **Glycosylation is critical for optimal activity**
    - Identified correct configuration of high & low molecular weight glycoforms
    - 5+ companies unsuccessful moving to clinical, including Takeda-Techpool & Amgen

Manufacturing & Trade Secrets

- **Completed manufacturing runs of 100L, 200L and 250L**
- High-efficiency production based on proprietary cell line technology for creating and growing cells that release large amounts of KLK1
- Exclusivity with manufacturer and proprietary cell line, expression system, composition & know-how

Patents

- Issued composition of matter (2033) & delivery (2033)
- Worldwide dose, route of delivery, formulation & indication patent pending (2038)

LEADERSHIP

RICK PAULS, MBA

PRESIDENT & CEO

Former venture capitalist with two early stage funds, including co-founder & Managing Director of life sciences VC fund

RICHARD PILNIK, MBA

CHAIRMAN

Former VP & Chief Marketing Officer at Eli Lilly, former President, Innovex (a Quintiles Company). Former board member of Elan Pharma & Chiltern (acquired)

SCOTT KELLEN, CPA (INACTIVE)

CFO & VP FINANCE

25+ years in life sciences industry. Held senior leadership roles including CFO and COO for several private and pubic (Nasdaq) companies

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CHIEF SCIENTIFIC OFFICER

28+ years experience with several neurological companies including Fidelity Biosciences, and with Bristol Myer Squibb's stroke group

HARRY ALCORN JR., PHARM.D

CHIEF MEDICAL OFFICER

30+ years biopharma experience. Principle Investigator of over 150 clinical studies, mainly kidney disease. Former Chief Scientific Officer at DaVita

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Clinical Professor of Cardiac Sciences at University of Calgary, BOD FoodChek Inc, BOD Canadian Medical Association; BOD SCS Inc.

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DIRECTOR

CFO at Trillium, a Nasdaq listed biotech company. Has been CFO of life sciences companies for last 15 years

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PRESIDENT, CEO & DIRECTOR

Former venture capitalist with two early stage funds, including co-founder & Managing Director of life sciences venture capital fund

ZHENYU XIAO, PHD

DIRECTOR

Managing Director of Hermed Capital, previously Associate General Manager of Fosun Pharmaceutical - deputy chief of Fosun Pharmaceutical IPO

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Nasdaq: DMAC

DM199 Protein replacement therapy - KLK1

Low KLK1 levels associated with kidney disease

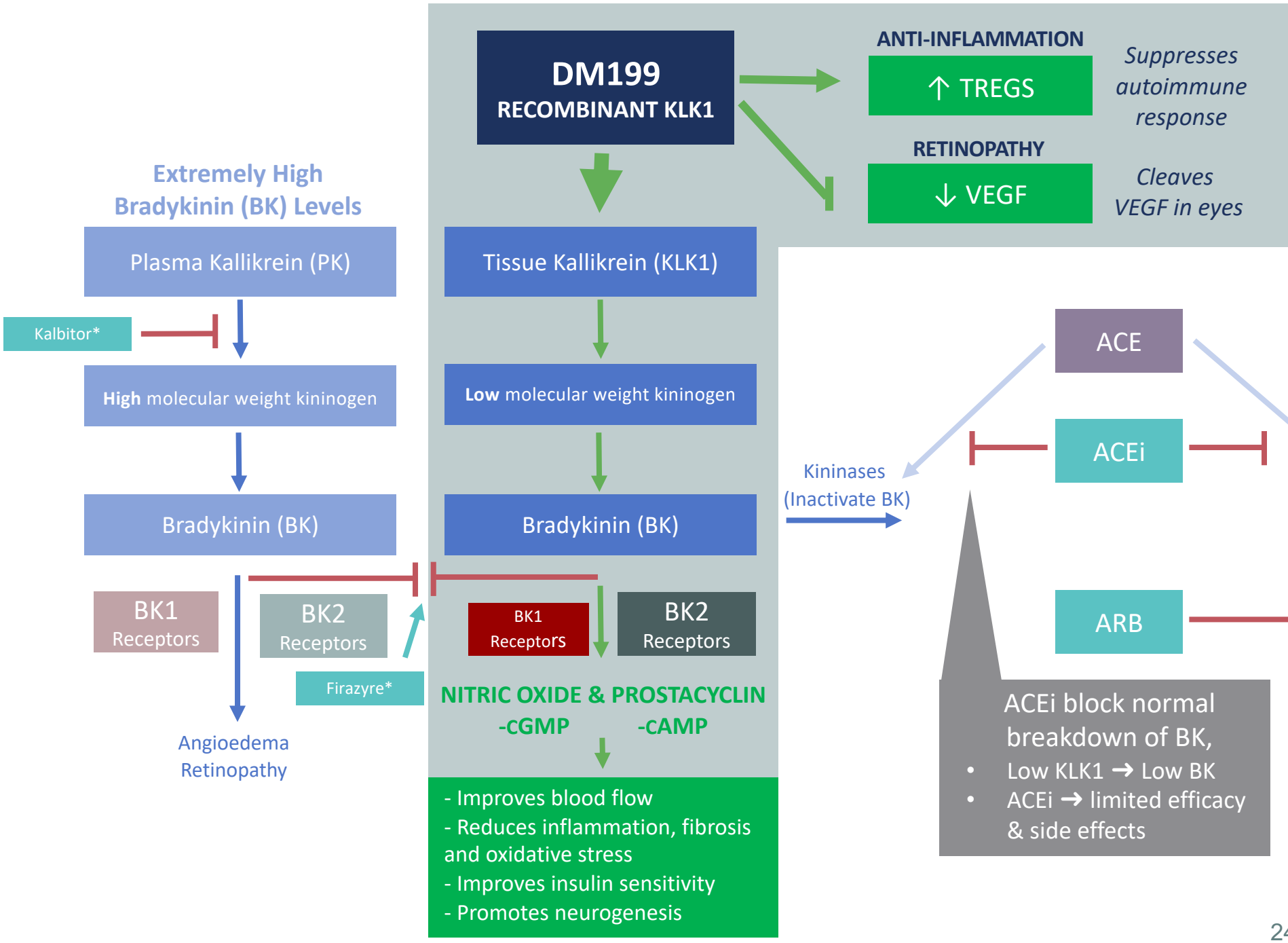
Crude form of KLK1 approved and treated millions successfully in Asia

Early DM199 signals in mechanism biomarkers, kidney function & urine albumin

DM199 (recombinant KLK1) as a safe treatment option for CKD and stroke patients

DM199 AND OTHER RELATED TREATMENTS

DM199 Boosts KLK1 Levels to Release Physiological Levels of BK When and Where Needed, Generating Beneficial Nitric Oxide, Prostacyclin and Anti-inflammatory Mediators



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