

# Renal Autologous Cell Therapy (REACT®) to Delay Dialysis in Advanced Chronic Kidney Disease

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## Introduction

- Chronic Kidney Disease is common, affecting > 10% of the global population
- Few treatments delay late-stage Chronic Kidney Disease (CKD) progression
- Cell-based therapies (CBT) may offer destination therapy to preserve kidney function and avoid or delay renal replacement therapy (RRT)
- REACT® (REnal Autologous Cell Therapy) (rilparencel) is a CBT under investigation to preserve kidney function in patients with Type 2 diabetic-related CKD to delay progression to end-stage kidney failure
- REACT(rilparencel) is composed of an autologous population of selected renal cells (SRCs) isolated from a participant's own kidney biopsy tissue and involved in kidney repair and regeneration

## Methods

- A Phase 2 FDA trial (NCT03270956) enrolled 10 participants with Type 2 diabetes-related CKD in a single arm, open label, multisite trial (Tables 1 and 2)
- Inclusion criteria: eGFR 14-20 ml/min/1.73m<sup>2</sup>, Hgb > 10 g/dL, HgbA1c < 10%
- On ACE/ARB with stable blood pressure and diabetes management
- Able to refrain from antiplatelet and anticoagulants at time of procedures
- After a percutaneous kidney biopsy and *ex vivo cell* expansion was performed, and a fresh product formulated
- Two CT guided injections of REACT into the renal cortex were completed ~ 6 months apart
- All procedure completed as outpatients with recovery room observation
- Participants followed up to 24 months to End of Study (EOS) after last injection
- Outcomes included:

eGFR slope change (by mixed linear effects analysis) (Figure 2)

Time to dialysis

Adverse events (AEs)

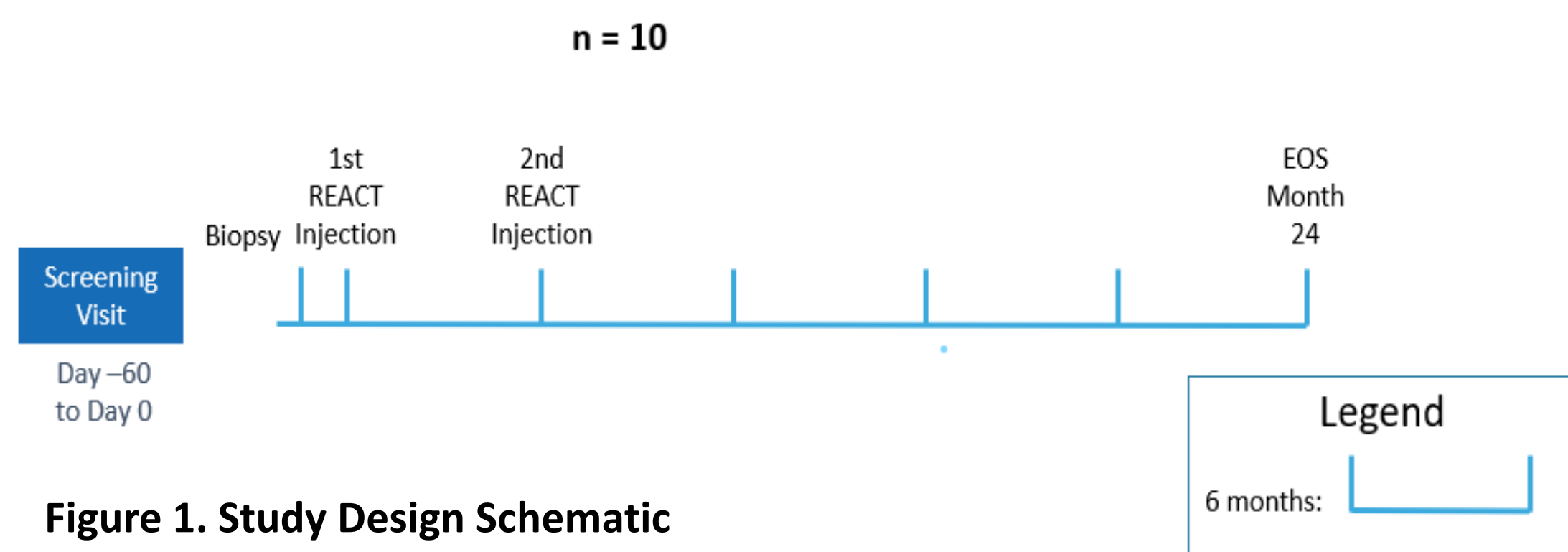


Figure 1. Study Design Schematic

Table 1. Demographics

Parameter	Overall (N=10)
Age (years), n	10
Age Mean (SD)	58.3 (5.03)
Female (%)	5 (50.0)
Race, n (%)	
White	8 (80.0)
Asian	1 (10.0)
Other	1 (10.0)
Hispanic or Latino	3 (30.0)
BMI (kg/m <sup>2</sup> ) at Screening Mean (SD)	35.20 (8.415)
Cortical thickness (cm)- Treated Kidney (n=8) Mean (SD)	1.59 (0.445)
Cortical thickness (cm) - Untreated kidney, (n=7) Mean (SD)	1.50 (0.361)

Table 2. Baseline and Follow-up Trial Parameters

Parameter	Baseline n=10	12 months n=5	EOS n=2
Serum Cr mg/dL	3.62±0.7	4.46±1.0	4.33±1.9
eGFR ml/min/1.73m <sup>2</sup>	15.5±2.7	12.6±3.3	14.8±7.7
Phosphate mg/dL	4.75±0.9	4.18±0.6	5.3±2.0
Potassium mEq/L	5.19±0.5	4.65±0.3	4.7±0.7
Bicarbonate mEq/L	19.24±2.5	19.22±2.3	18.50±5.9
Calcium mg/dL	8.95±0.6	9.06±0.7	9.0±0.4
PTH ng/L	220.9±126.3	253.6±208.1	297.3±301.0
Hemoglobin g/dL	10.49±1.1	10.18±1.8	11.3±0.2

Table 3. Kidney Function at Baseline and Post 1<sup>st</sup>/2<sup>nd</sup> REACT Injections

Kidney Function (eGFR slope ml/min/1.73m/year)		
Timeframe	Participants (n)	eGFR Slope (SE)
Pre-Injection	10	-6.3 (1.29)
Post First Injection	10	-3.4 (0.54)
Post Second Injection	9	-2.8 (1.01)

## Results

- 9 out of the 10 participants received 2 injections
- Pre-injection eGFR slope improved 2.9 & 3.5 ml/min/1.73m/year post 1<sup>st</sup> and 2<sup>nd</sup> injections (Table 3, Figure 2)
- 2 participants were alive and dialysis free at end of study (EOS)
- Safety profile: no AEs related to REACT, 11 AEs related to biopsy
- SAEs: Biopsy-related hematoma and small resolved AVF, no transfusions
- 6 participants progressed to sustained RRT
- 2 deaths without RRT (COVID-19 and diabetes-related with COVID-19)
- Predicted time to dialysis ~10 months based on extrapolated slope (Figure 3)
- Median time to dialysis 19.4 months (IQR 13.3-27.9) with REACT (Figure 3)
- KFRE indicated > 95% risk of RRT at 5 years 8/10 participants (Table 4)

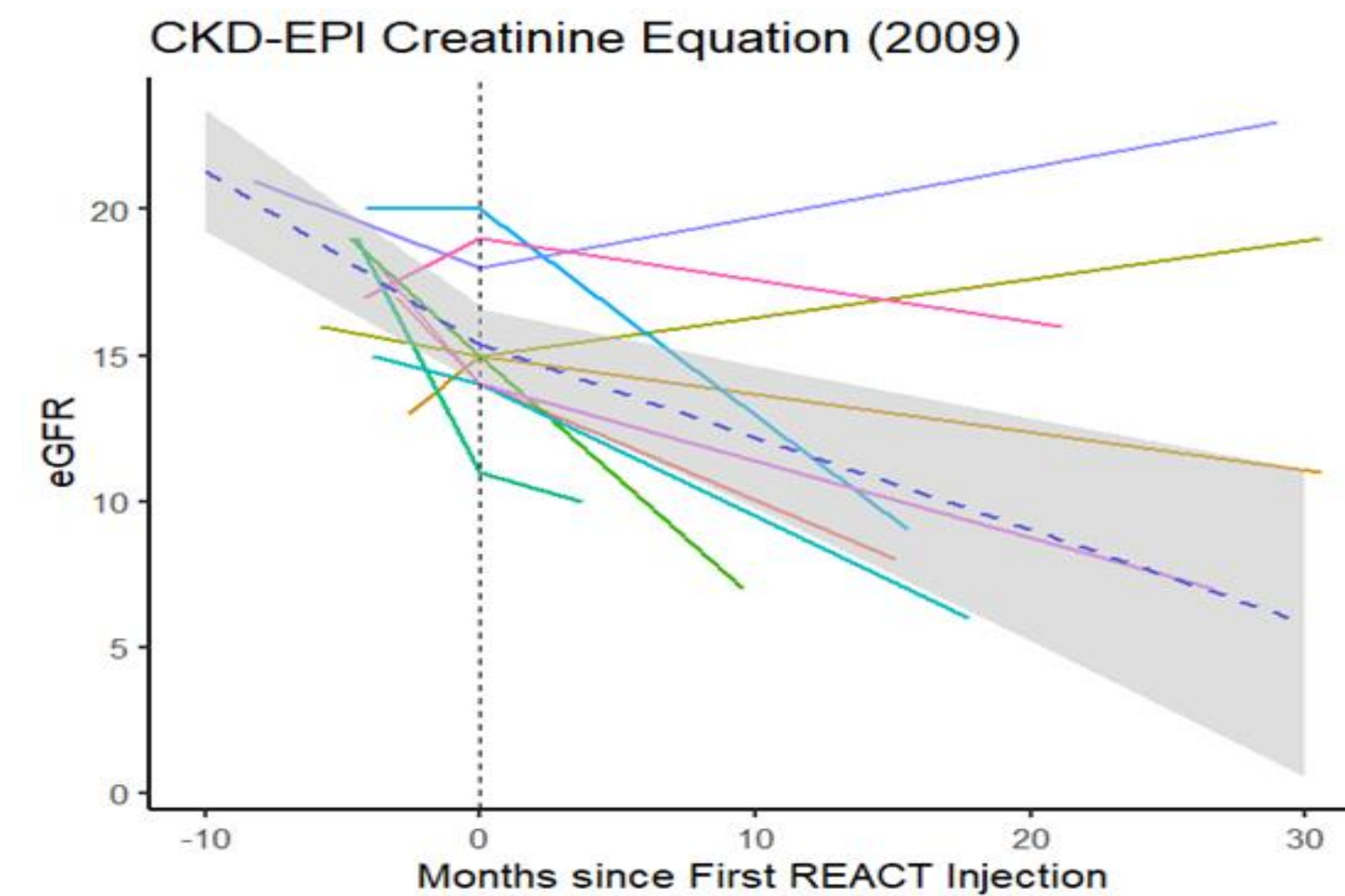


Figure 2. Linear mixed effects model

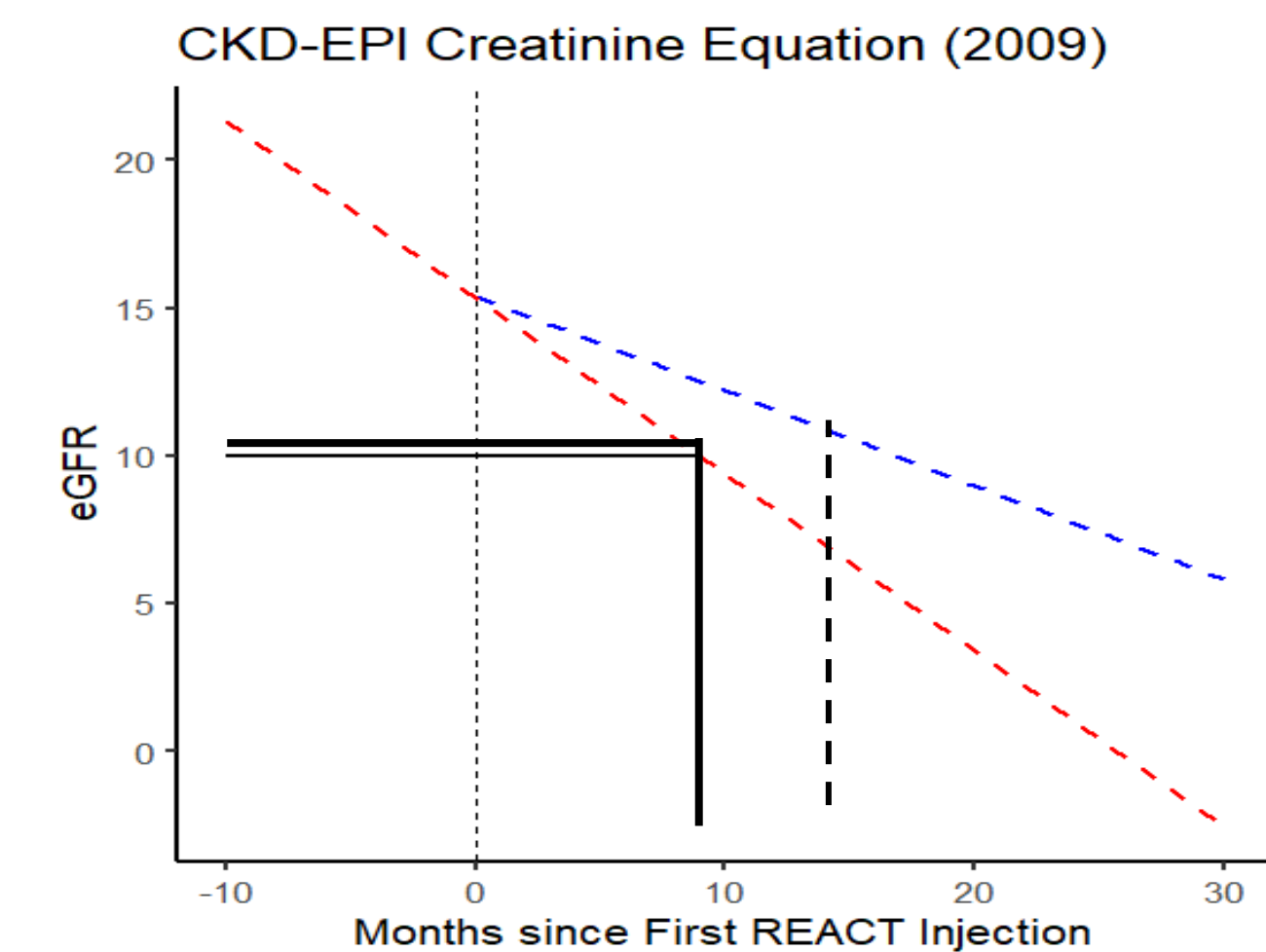


Figure 3. Extrapolated baseline slope prediction of time to dialysis  
 Red line: extrapolated pre-injection eGFR slope (-7.2ml/min/1.73 m<sup>2</sup>) extended 30 months  
 Blue line: calculated eGFR slope post first REACT injection (-3.4 ml/min/1.73 m<sup>2</sup>) extended 30 months  
 Black solid line: estimated TTD ~10 months assumed start of dialysis at eGFR = 10 ml/min/1.73 m<sup>2</sup>  
 Black dashed line: TTD median 19.4 months (IQR 13.3-27.9) treated with REACT

Patient	5-year risk ESKD %*	TTD**or death (mos.) post- Injection
1	99.4	19.4
2	84.5	30.6***
3	100	27.9
4	95.8	9.6
5	100	6.0
6	100	16.2
7	99.9	20.3
8	75.3	29.2***
9	99.8	6.1
10	96.4	13.3

Table 4. Kidney Failure Risk Equation – 8 Variable\*

\*KFRE – 8 Variable. [https://qxmd.com/calculate/calculator\\_125/kidney-failure-riskequation-8-variable](https://qxmd.com/calculate/calculator_125/kidney-failure-riskequation-8-variable)

\*\*Time to dialysis (2016 Equation): time in months from first REACT injection to start of dialysis.

\*\*\*Censored values: participants not starting dialysis during study are censored at last visit.

## Conclusions

- CBT may offer a non-dialytic treatment option for T2DKD progressing to RRT
- REACT (rilparencel) was tolerated and preserved function to decelerate eGFR decline
- eGFR decline improved 2.9 after 1<sup>st</sup> and 3.5 ml/min/year after 2<sup>nd</sup> injection this trial population
- The median time to dialysis observed was ~19.4 months with a mean baseline eGFR of 15.5 ml/min
- Bicarbonate, Calcium, and Hgb were stable with increase in iPTH at 12 mos
- REACT (rilparencel) procedures showed acceptable safety profile in high comorbidity group
- There are few late CKD 4 treatment options in this extremely high-risk group
- Cell-based therapies have the potential to affect nephron structure and function in high-risk populations with further Phase 3 RCTs underway

## REFERENCES

- Stavas et. al., Renal Autologous Cell Therapy in type 2 diabetes with late stage 4 diabetes-related chronic kidney disease trial design and early analysis, BPU 2022. DOI: 10.1159/000527582.
- Grams et. al., Development and validation of prediction models in the population with and without diabetes. Diabetes Care, 2022;45:2025-2063.

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## POSTER CONTACT

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