

# **SGLT2-remmers bij hartfalen**

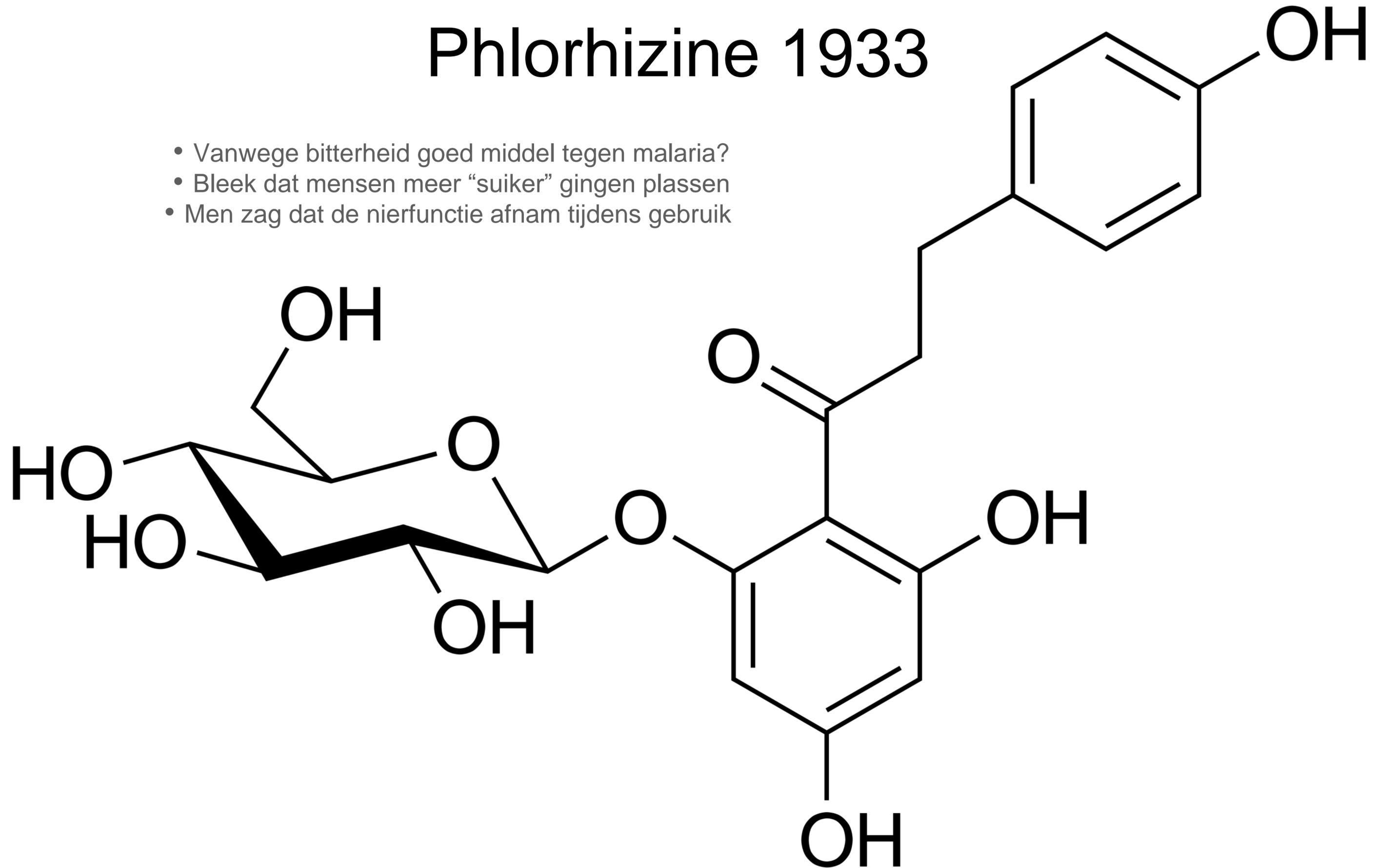
**Studies en potentiële werkingsmechanismen**

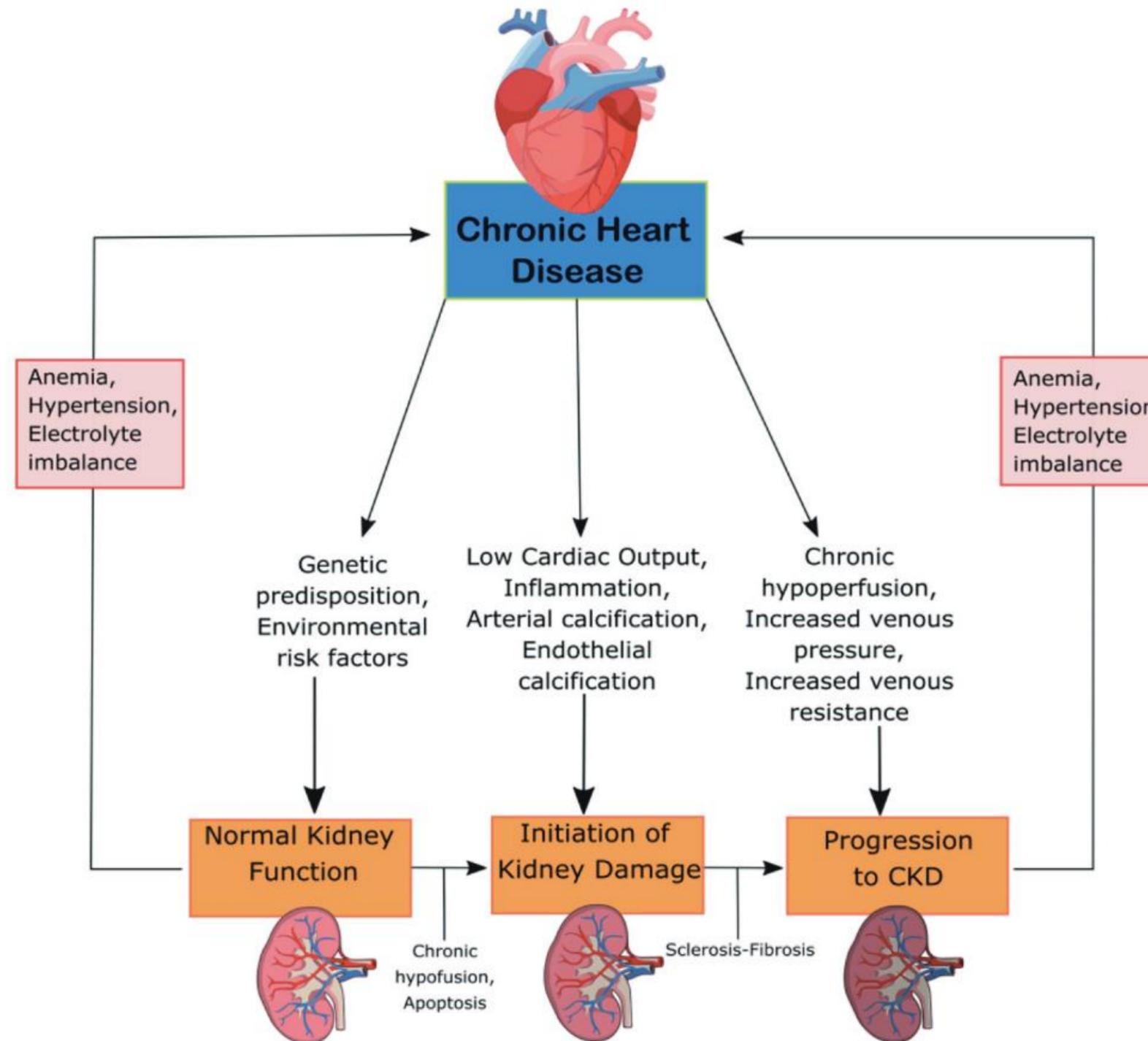
**dr. Harm Geers, openbaar apotheker, podcaster**



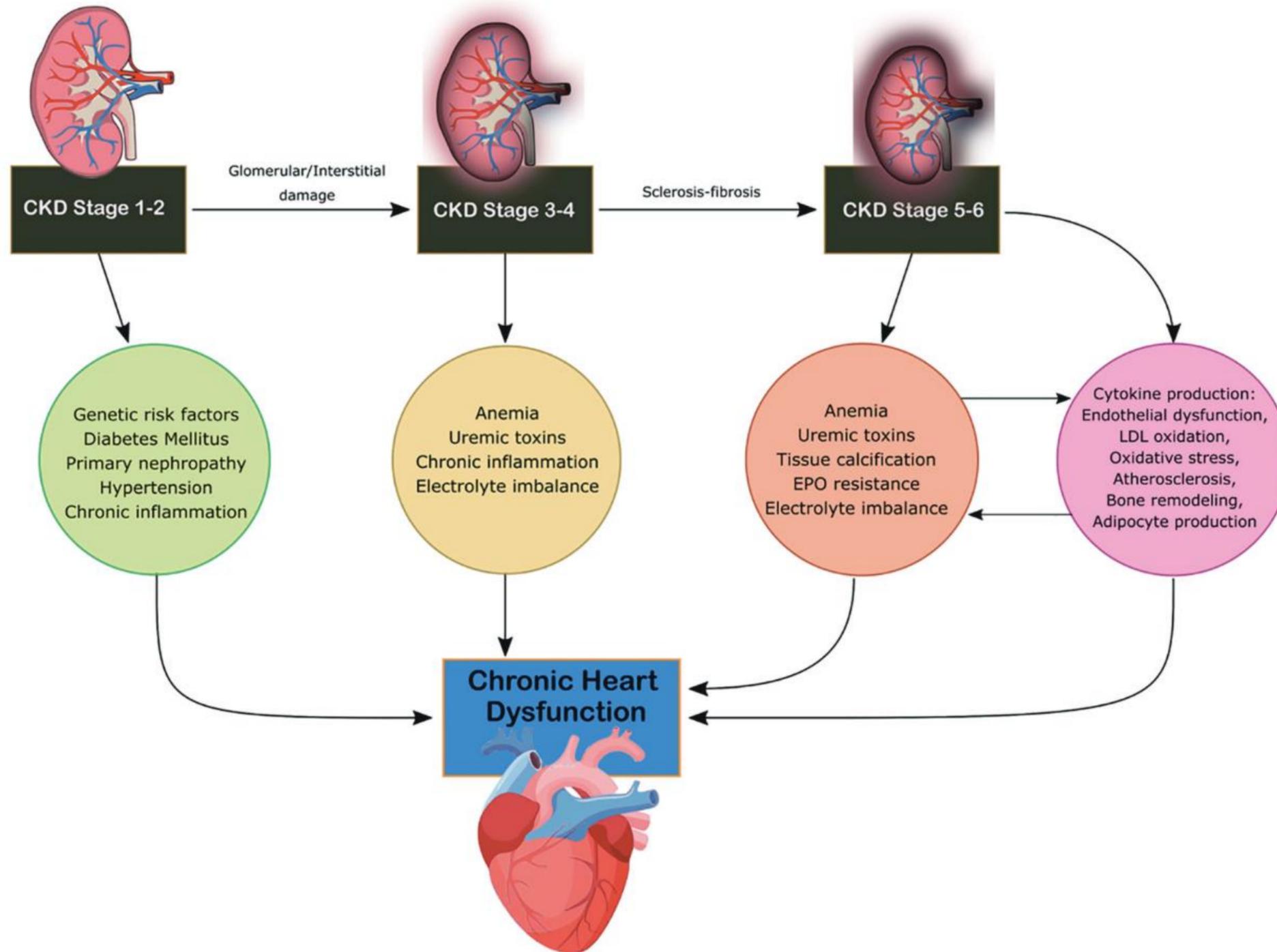
# Phlorhizine 1933

- Vanwege bitterheid goed middel tegen malaria?
- Bleek dat mensen meer “suiker” gingen plassen
- Men zag dat de nierfunctie afnam tijdens gebruik





**Figure 2.** Mechanism of damage in CRS-2. CKD, chronic kidney disease; CRS, cardiorenal syndrome.

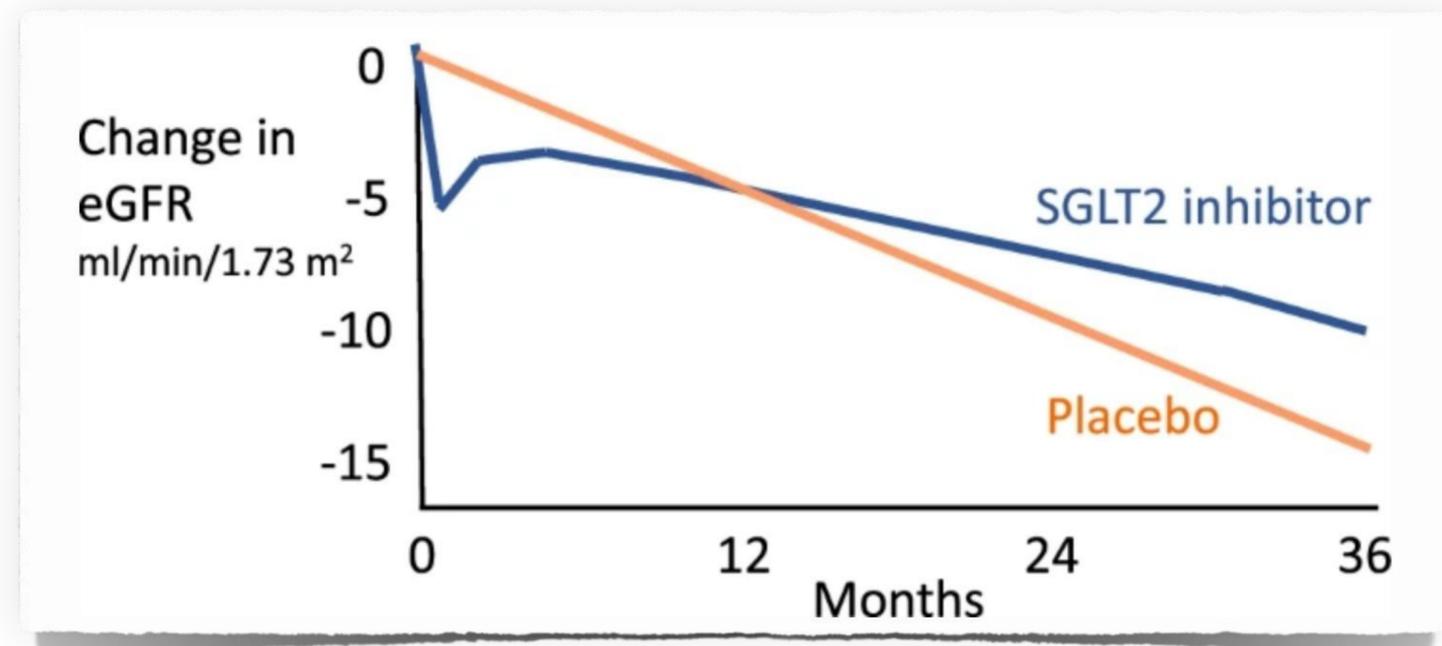


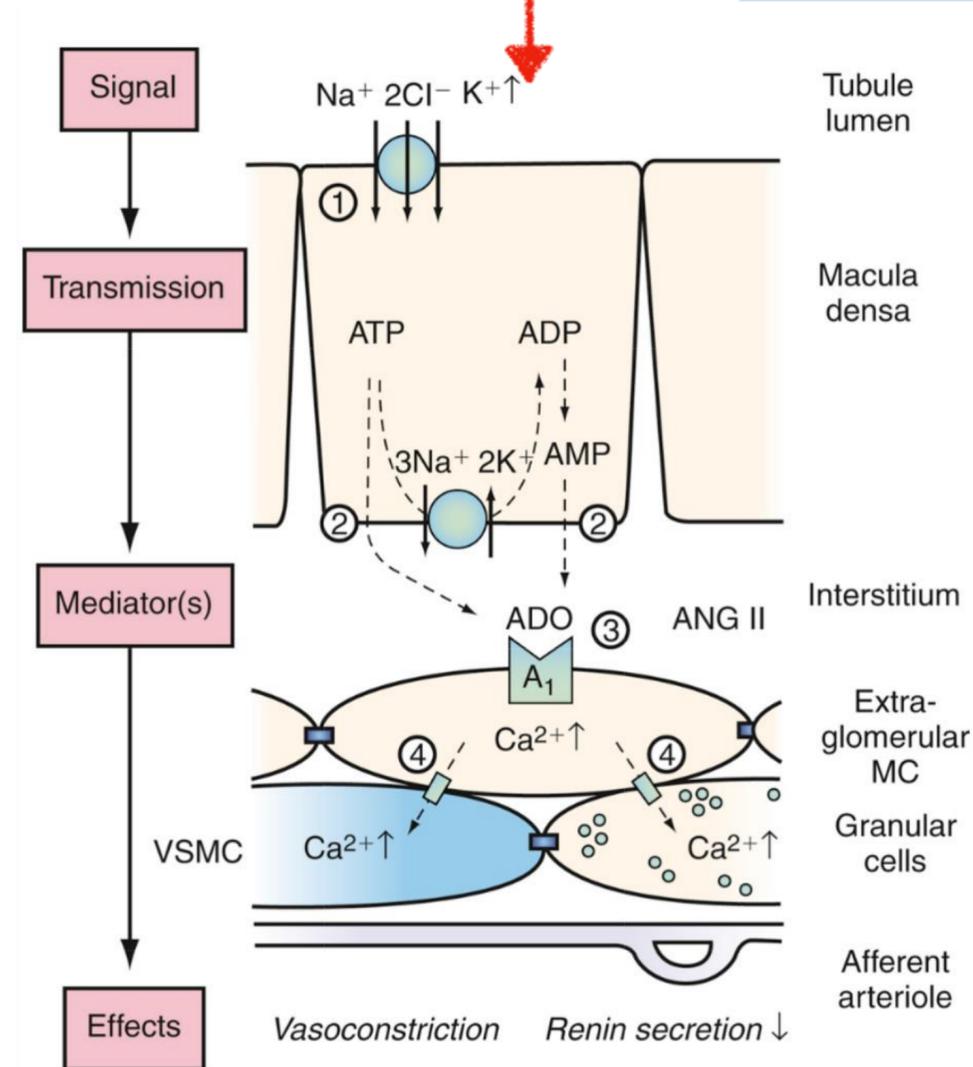
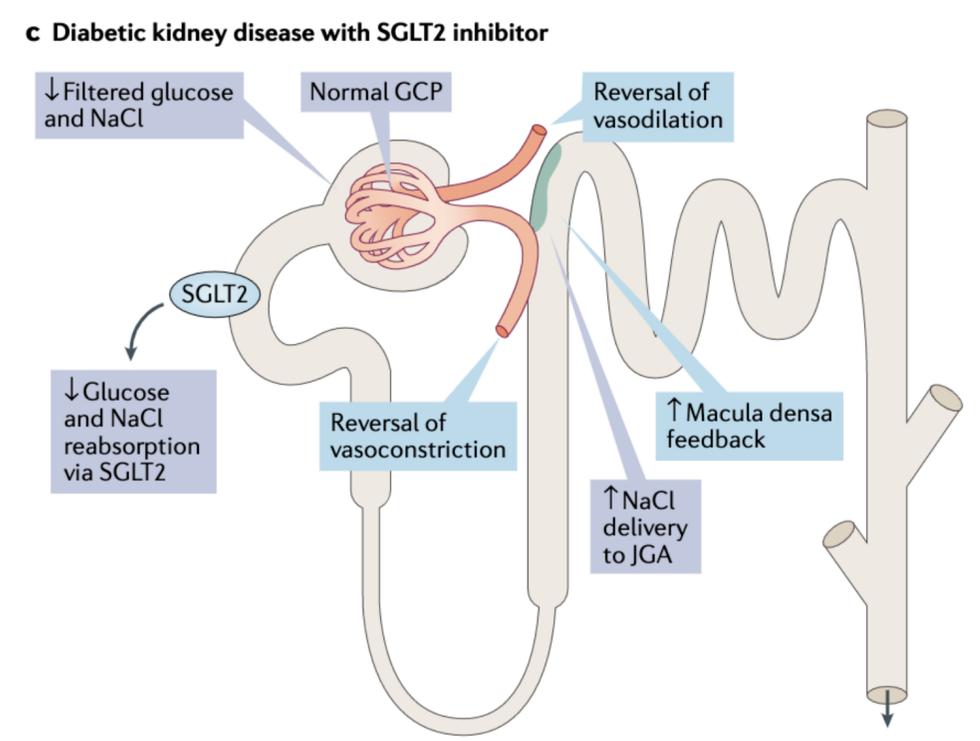
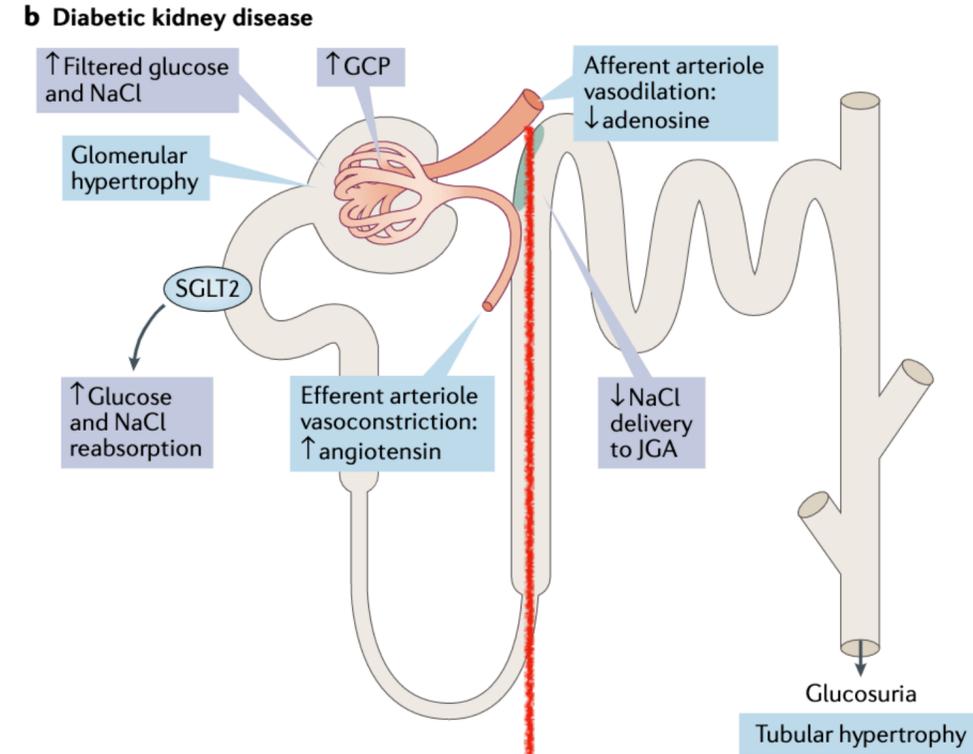
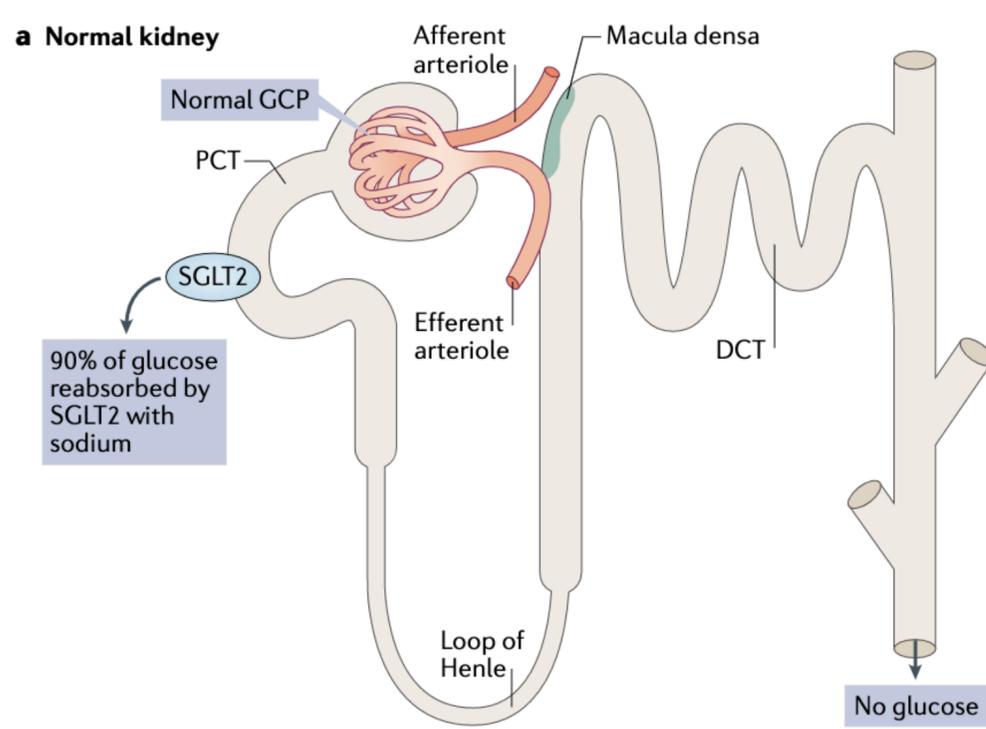
**Figure 4.** Mechanism of damage in CRS-4. CKD, chronic kidney disease; CRS, cardiorenal syndrome; EPO, erythropoietin; LDL, low-density lipoprotein.

# Eerste studie bij DM2

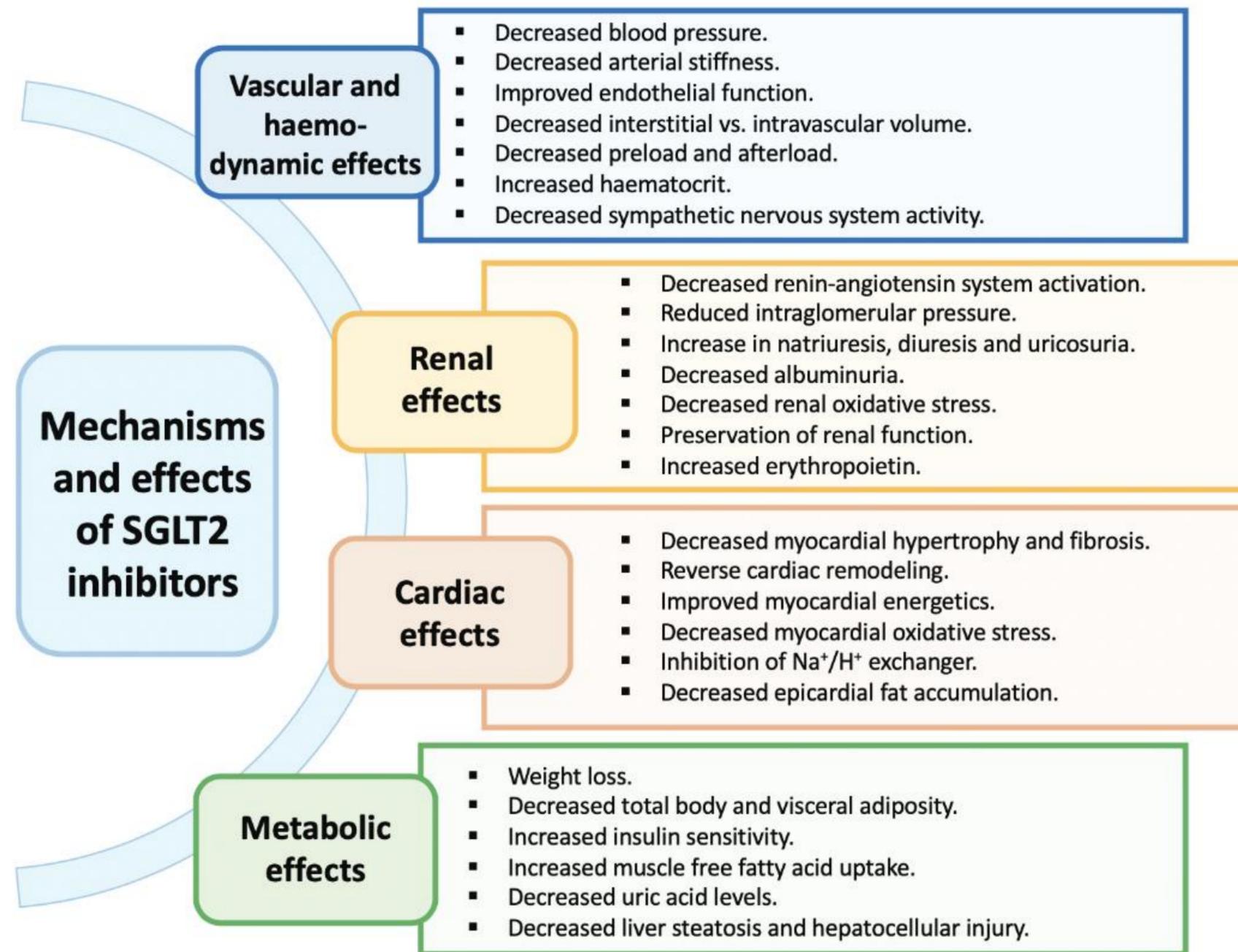
## EMPAREG OUTCOME (Empagliflozine)

- Verminderde cardiovasculaire mortaliteit bij DM-2 (MACE; Major Adverse Cardiovasculair Events; cardiovasculaire dood, niet fataal MI, CVA)
- Minder hospitalisaties door hartfalen
- Verbetering in achteruitgang van nierfunctie, aanvankelijke daling in GFR, maar minder snelle achteruitgang.





DeFronzo RA, Reeves WB, Awad AS. Pathophysiology of diabetic kidney disease: impact of SGLT2 inhibitors. *Nat Rev Nephrol.* 2021;1–16.



**Figure 1** Proposed biological mechanisms and effects of sodium–glucose co-transporter 2 (SGLT2) inhibitors.

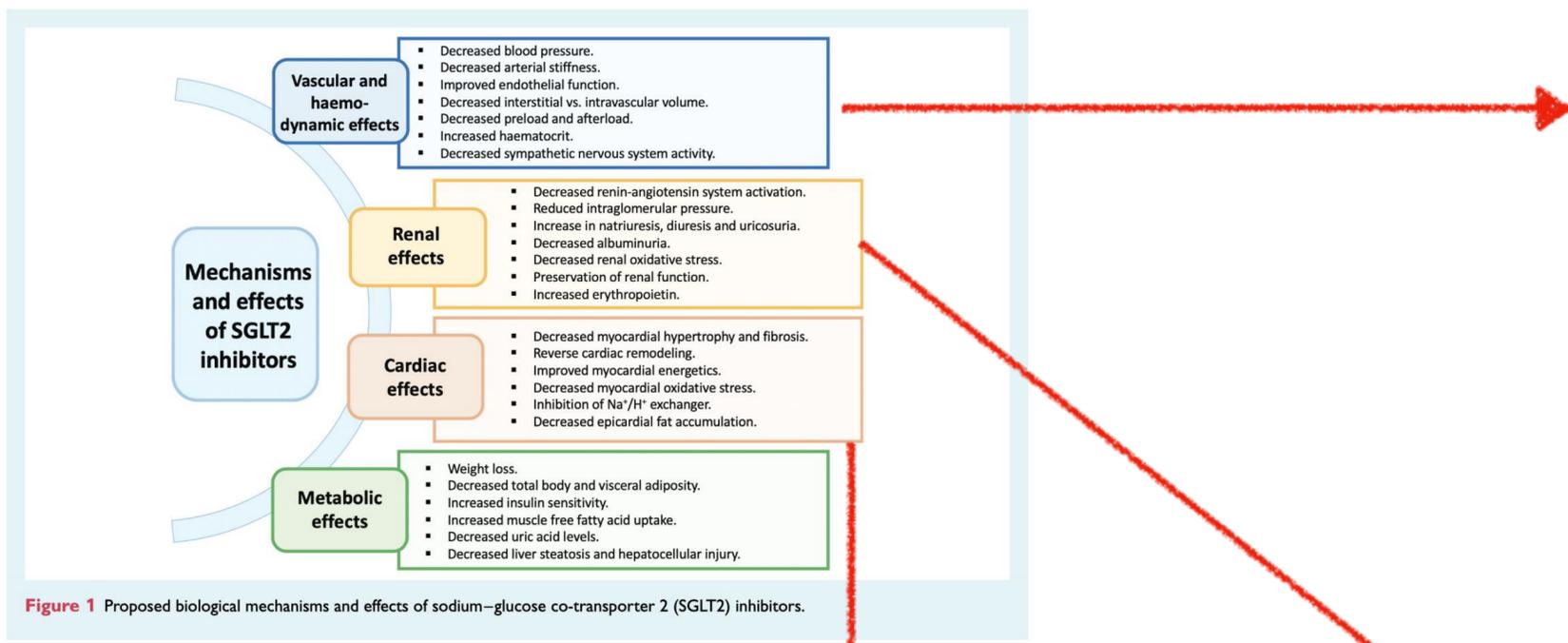
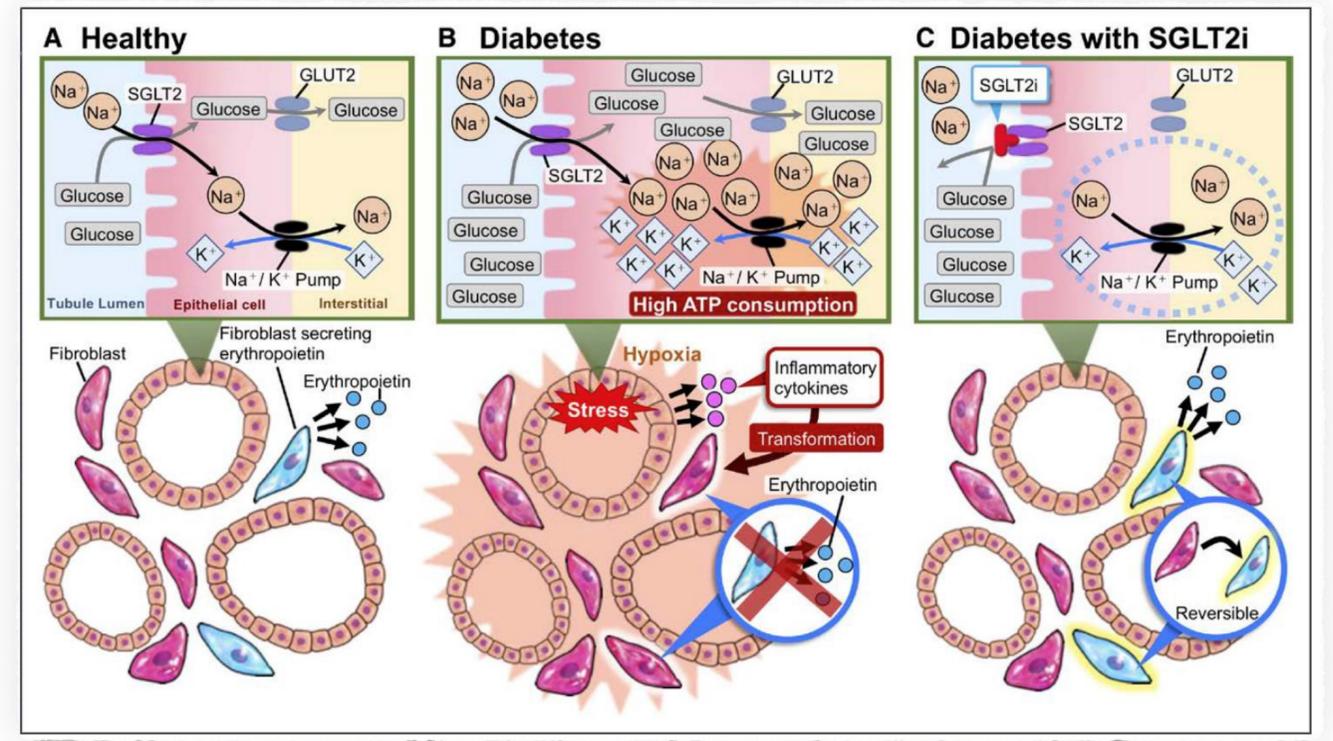
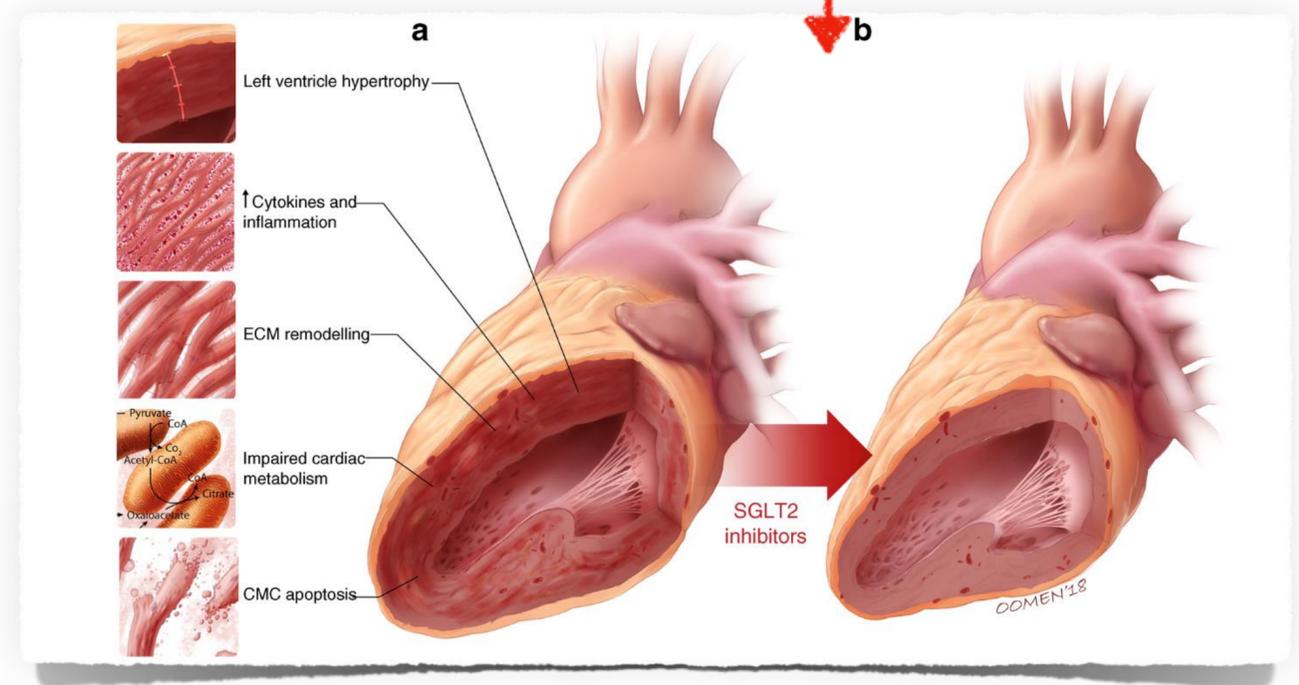
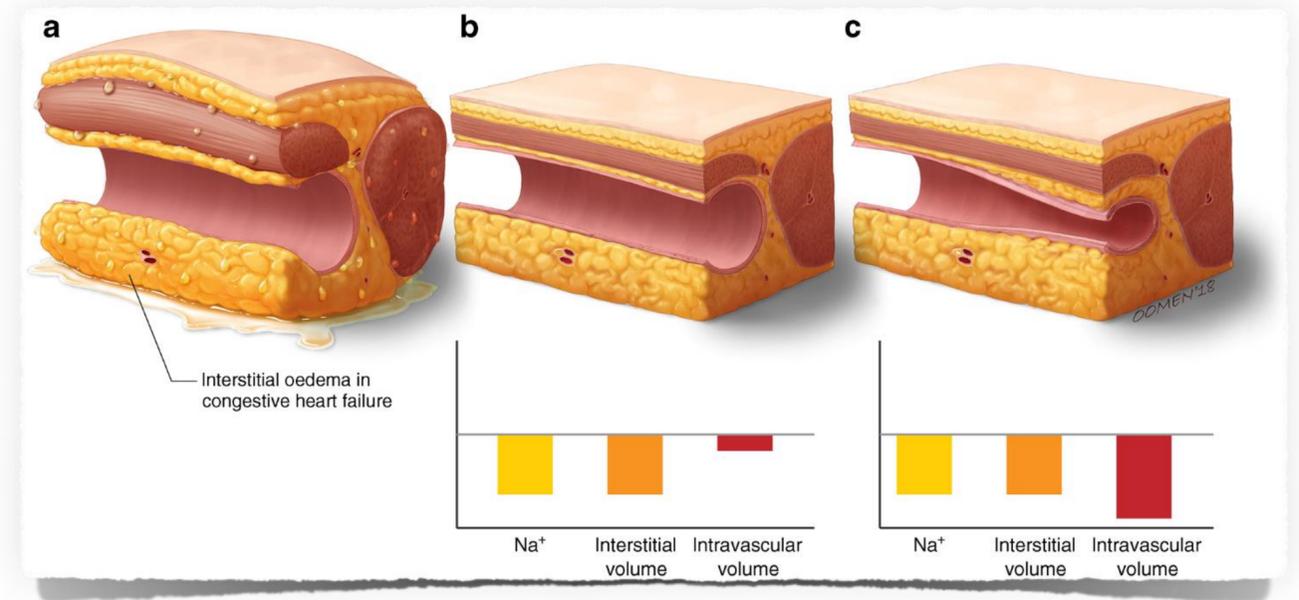
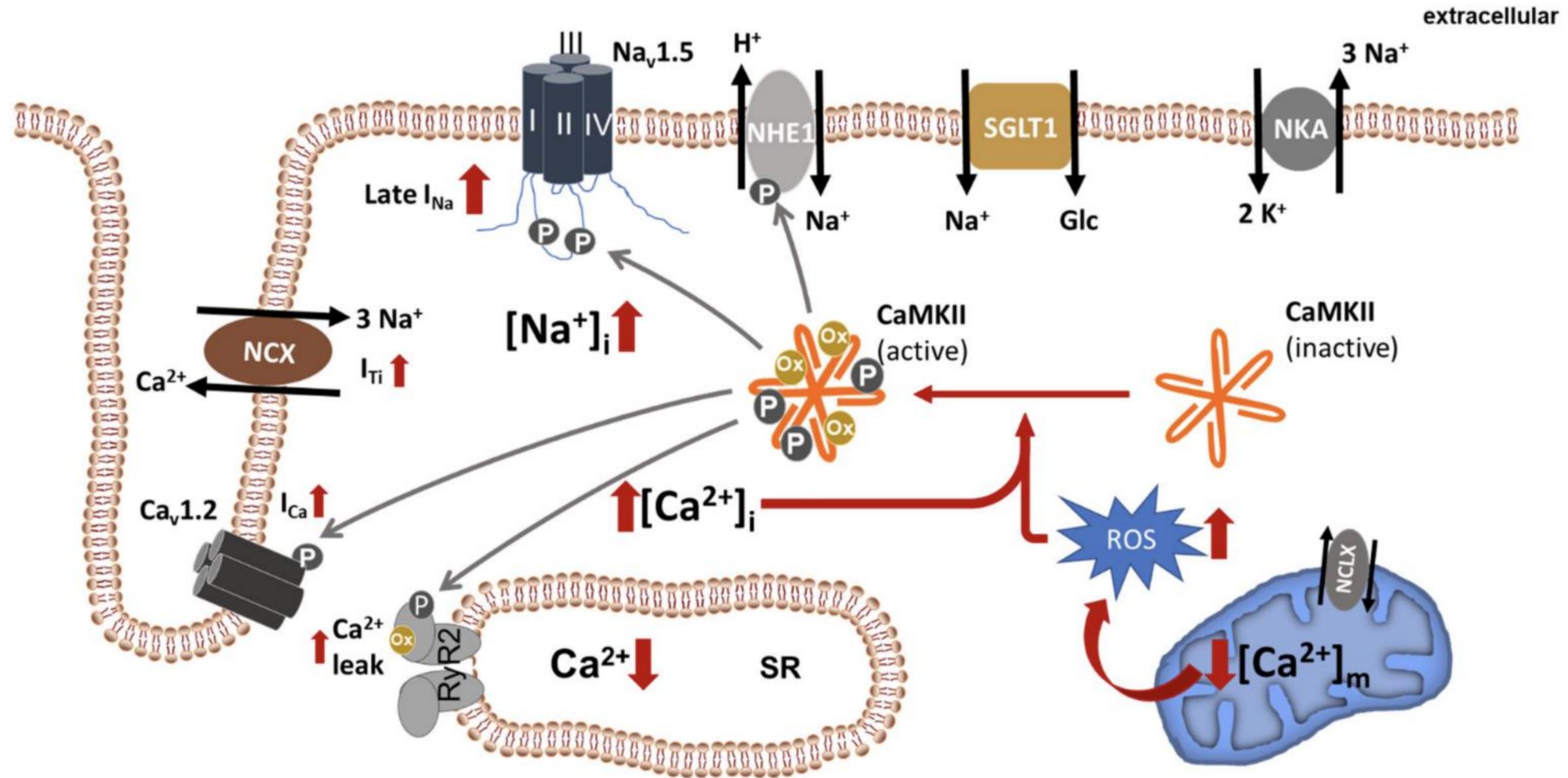


Figure 1 Proposed biological mechanisms and effects of sodium-glucose co-transporter 2 (SGLT2) inhibitors.

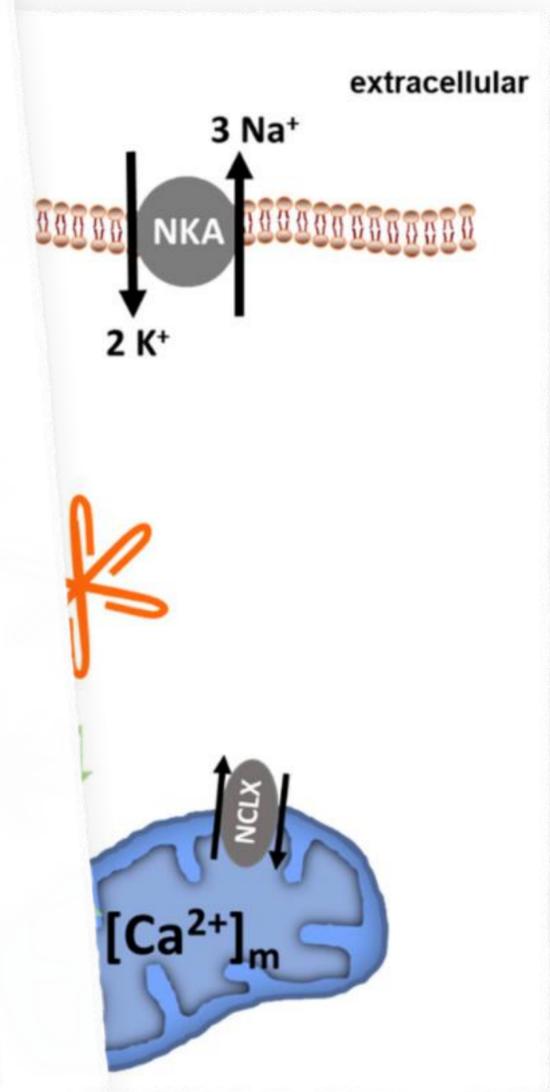
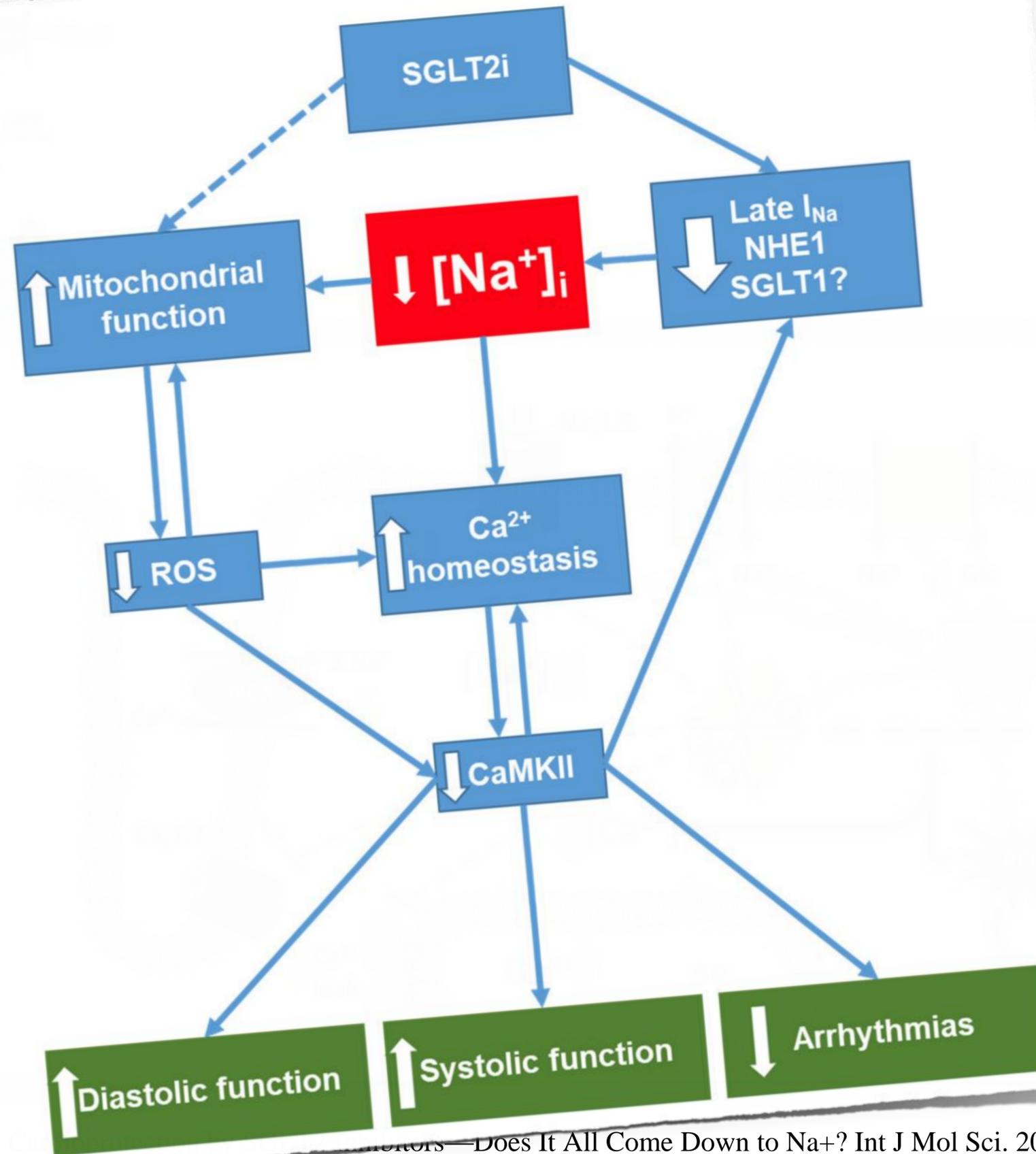
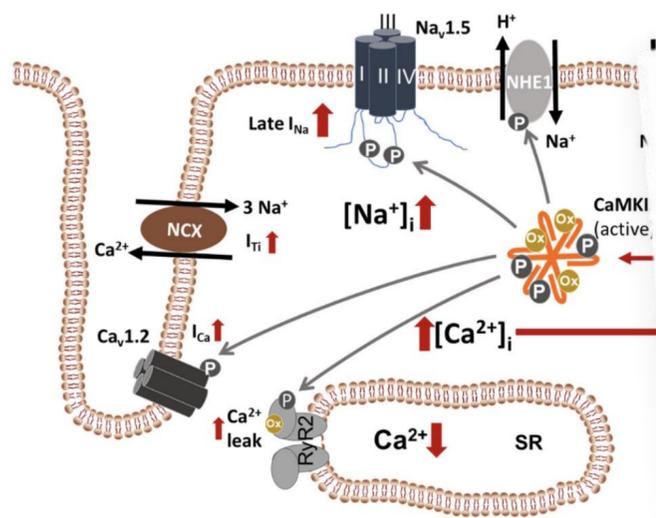


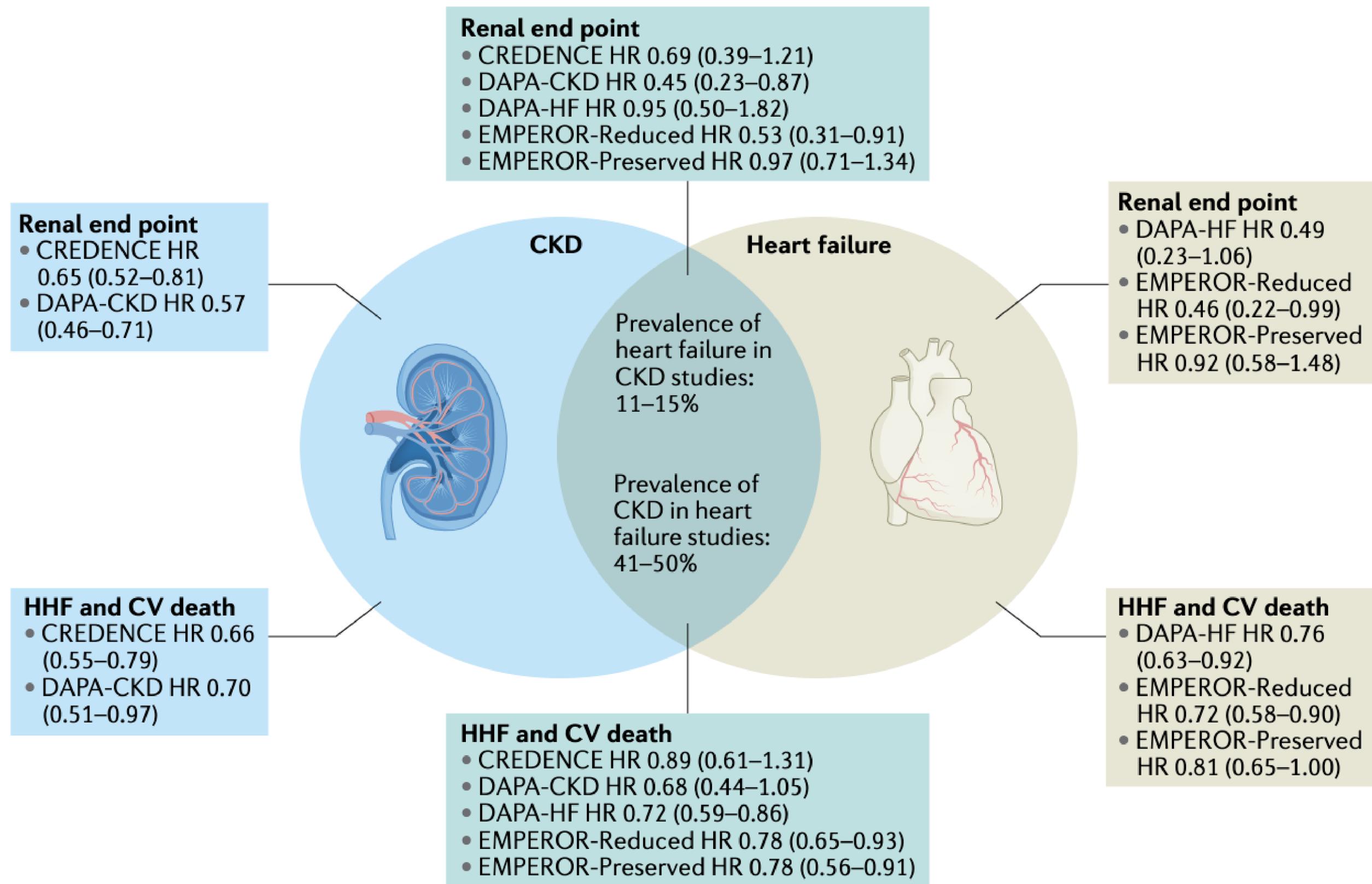
1. Sano M, Goto S. Possible Mechanism of Hematocrit Elevation by Sodium Glucose Cotransporter 2 Inhibitors and Associated Beneficial Renal and Cardiovascular Effects. *Circulation*. 2019;141:1000-1010.

2. Verma S, McMurray JJV. SGLT2 inhibitors and mechanisms of cardiovascular benefit: a state-of-the-art review. *Diabetologia* [Internet]. 2018 Aug 23;61(10):1-10.



1. Trum M, Riechel J, Wagner S. Cardioprotection by SGLT2 Inhibitors—Does It All Come Down to Na<sup>+</sup>? Int J Mol Sci. 2021;22(15):7976.





# Conclusie

## SGLT2 remmers

- Ze werken op meerdere fronten
  - op de nier (daling eGFR en intraglomerulaire druk)
  - op het hart (rechtstreeks)
  - cardiovasculair (via volume depletie)
  - metabool (ketogenese, EPO stimulerend)
  - ook gunstige effecten op het hartritme (minder AF gezien in studies -19% in DECLARE TIMI 58)

# Vragen?

## Nu of later

- [hcj.geers@apotheekbennekom.nl](mailto:hcj.geers@apotheekbennekom.nl)
- @HarmGeers
- Nakijken TGF kan op mijn YouTube (<https://www.youtube.com/watch?v=60npmZjYqUU&t=78s>) kanaal of via Apothekerspodcast.nl