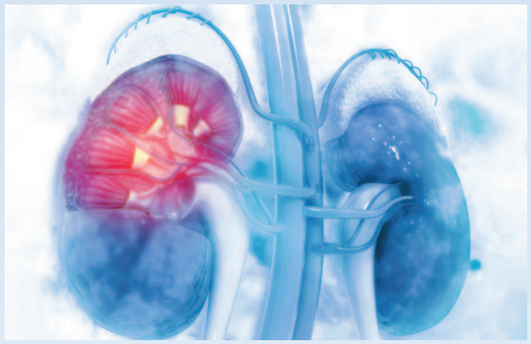
Technology Snapshot

New Therapeutics for Diabetic Kidney Disease – Gliflozins

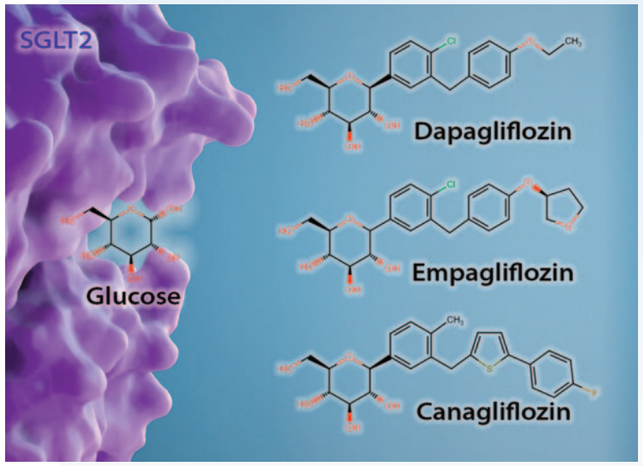
Diabetic kidney disease (DKD) is a serious complication arising from diabetes that affects 1 in 3 people with diabetes globally. Known as a silent killer, 9 out of 10 patients with kidney damage or reduced kidney function are asymptomatic until it is too late. The most effective strategy to reduce the impact of DKD is to receive an early and accurate diagnosis, allowing doctors to implement suitable treatment plans.



Source: US Centers for Disease Control and Prevention

Diagnosis

Proteomics International has created PromarkerD, the world's first predictive test for DKD and the only test that can predict the onset of kidney decline in patients with type 2 diabetes (T2D). In clinical studies published in leading journals, PromarkerD correctly predicted up to 86% of otherwise healthy diabetics who went on to develop DKD within four years.



Gliflozins are a drug technology composed of a glucose-like domain and a side chain that differs between gliflozin drugs. The glucose-like domain allows the drug to bind to SGLT2 gateways, and the side chain inhibits their function.

Gliflozins – SGLT2 Inhibitors

The kidneys' basic function is to filter out a wide array of unwanted substances from the bloodstream, and facilitate the reabsorption of nutrients and salts via controlled gateways. One of those controlled gateways within the kidneys is the Sodium-Glucose Cotransporter Protein 2 (SGLT2), responsible for reabsorbing both glucose and sodium back into the bloodstream. Gliflozins are a class of drugs that inhibit this interaction, preventing the filtered-out glucose and sodium from being reabsorbed back into the bloodstream. This results in reduced blood sugar levels.

Proteomics International Laboratories Ltd

Gliflozin drugs were first approved for the treatment of diabetes in both the EU and US in 2013. Subsequently, gliflozins were shown in clinical trials to also be beneficial in reducing cardiovascular disease (CVD) symptoms in patients with diabetes. Most recently, clinical trials have shown that gliflozins can treat DKD, and two drugs have been granted US Food and Drug Administration (FDA) and European Medicines Agency (EMA) approval for this use, with more currently being tested.

Canagliflozin

was the first drug in 20 years shown to slow the progression of DKD in patients with type 2 diabetes.

Sales of gliflozin drugs

Canagliflozin *(Invokana)* developed by Mitsubishi Tanabe licensed by Janssen	**2013:** *treat type 2 diabetes *†*	$ 795 million		**2018:** *treat cardiovascular disease *†*		**2019:** ***treat DKD ****	**2020:** ***treat DKD †***	
Dapagliflozin *(Farxiga/Forxiga)* by Astrazeneca/ Bristol-Myers Squibb	**2012:** *treat type 2 diabetes †*	**2014:** *treat type 2 diabetes **			$ 1.96 billion		**2020:** *treat cardiovascular disease *†*	**2021:** ***treat CKD and DKD *†***
Empagliflozin *(Jardiance)* by Boehringer Ingelheim/ Eli Lily		**2014:** *treat type 2 diabetes *†*	**2016:** *treat cardiovascular disease **				**2021:** *treat cardiovascular disease †*	$ 2.82 billion

** FDA approval*
† EMA approval

Reported 2020 global sales in USD

In July 2021, Proteomics International announced the results of a collaborative 3-year study with Janssen that used blood samples from over 2,000 patients. The results found that taking canagliflozin lowers the PromarkerD risk score for DKD in patients with type 2 diabetes (see page 11).

Changing Lives

PromarkerD can predict the onset of diabetic kidney disease before clinical symptoms appear. Now the gliflozin drugs offer a new treatment for patients with DKD. By coupling early testing of asymptomatic diabetes patients with early therapeutic intervention DKD may become a disease that can be treated even before it appears. Equipped with both an accurate prognostic tool, and the first DKD drugs in 20 years emerging on the market, clinicians have more options now than ever to change the lives of those with diabetes.

PromarkerD

Proteomics International's PromarkerD test searches for proteins in the blood associated with diabetic kidney disease. The test uses a panel of three biomarkers, combined with three simple clinical factors, to predict the onset of the disease up to four years in advance.

PromarkerD
CHANGING LIVES