MEDICAL ADVANCES

Innovation demonstrates continued importance of platinum in medical applications

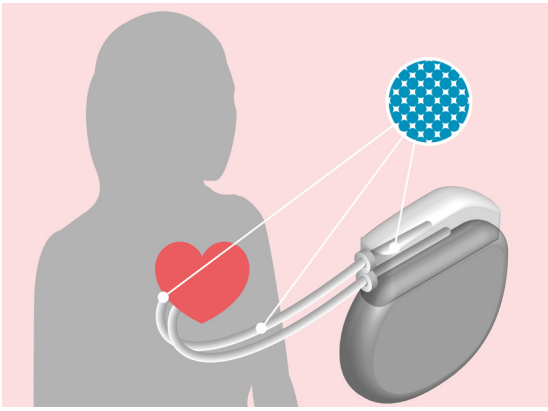
Continuous glucose monitoring devices are becoming more widely available. For example, they were made available on prescription from the UK's National Health Service at the end of last year - a move described as game-changing for people with Type 1 diabetes and Type 2 insulin-dependent diabetes as it enables them to manage their condition in real-time.

Diabetes is a condition that causes a person's blood sugar level to become too high. Type 1 diabetes is a lifelong condition where the body's immune system attacks and destroys the cells that produce insulin. With type 2 diabetes, the body does not produce enough insulin, or the body's cells do not react to insulin properly. It is estimated that 415 million people are living with diabetes in the world, equivalent to one in 11 of the world's adult population. This figure is expected to rise to 642 million people living with diabetes worldwide by 2040.

Continuous glucose monitors comprise a wearable glucose biosensor that sends information to a mobile app or other device that can read the data output from the sensor, allowing diabetes patients to keep track of their glucose levels at all times, without having to scan or take a finger prick blood test. The glucose biosensor can be attached to either a person's arm or stomach and it works by sensing how much glucose is in the fluid under the skin.

The glucose biosensor uses an enzyme to catalyse the oxidation of glucose to generate a current. The enzyme used in most glucose biosensors is glucose oxidase, which oxidizes glucose to gluconic acid and hydrogen peroxide. The hydrogen peroxide is then reduced to water by a catalyst, usually platinum, with the current generated being proportional to the concentration of glucose.

Researchers from Nanjing University in China are further exploring ways in which platinum-based applications could potentially assist with the management of diabetes.



Platinum has a broad range of medical and biomedical applications including its use in pacemakers

They are investigating the causes and possible treatment of insulin resistance in type 2 diabetes, which research indicates is caused by unstable molecules produced by mitochondria within cells, known as reactive oxygen species (ROS). Excessive ROS production can result in DNA, protein, and RNA damage and cell death.

A potential method for reducing excess ROS production involves using ultrasmall platinum nanoparticles, known for their antimicrobial, anticancer, and antioxidant properties which are embedded into liver-targeted biodegradable silica nanoshells.

Platinum medical demand

In addition to its use in glucose biosensors, platinum has a broad range of medical and biomedical applications including catheters, stents, clot-retrieval devices, cochlear implants and pacemakers. It is also used in some treatments for cancer. Demand for platinum in medical applications was 278,000 oz in 2022, and is forecast to grow by three per cent this year to 287,000 oz.

Contacts:
Brendan Clifford, Institutional Distribution, bclifford@platinuminvestment.com
Edward Sterck, Research, esterck@platinuminvestment.com
Vicki Barker, Investor Communications, vbarker@platinuminvestment.com