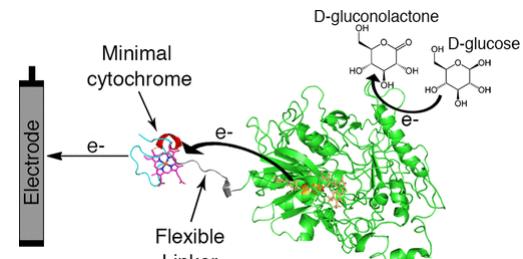


A Recombinant Fusion Glucose Dehydrogenase for Glucose Sensing

Blood glucose monitoring is an essential daily task of diabetic patients. Most glucose sensing devices, available today, use an enzyme that oxidises glucose. During glucose oxidation, electrons are being released. These electrons flow from the enzyme to an electrode creating an electrical current which reflects the patient's blood glucose level. This is the most widely used form of glucose monitoring in the world and most of the worlds market relies on the activity and reliability of these enzymes. There are several enzymes that are being used today one of the main ones being Glucose dehydrogenases. The Glucose dehydrogenases used today and which are produced in yeast or fungi; suffer from non-specific interactions with other sugars and low electron transfer due to their inability to directly communicate with an electrode, thus requiring additional molecules in the sensing device. Furthermore, to operate these devices high redox potentials are necessary introducing non-specific background noise to the sensing event resulting in a less precise output.

The Technology

Based on the rational that by improving communication between the Glucose dehydrogenase and the sensing interface (electrode) the accuracy and sensitivity of the current methods can be improved, we generated a fusion enzyme that can be expressed in bacteria and can efficiently oxidise glucose and directly transfer the electrons from the oxidation to an electrode under very low redox potential thus alleviating the need for additional mediator molecules and eliminating background non-specific oxidation at the electrode. See our recent publication at: <http://pubs.acs.org/doi/abs/10.1021/jacs.7b07011>



Advantages

- ✓ An enzyme used As Is to modify the sensing interface without the addition of external mediators or expensive redox polymers to the surface.
- ✓ The fused enzyme requires low redox potential applied to the electrode.
- ✓ Accurate and specific blood sugar sensing, with no expected interference by other compounds that may be present in the patients' blood such as vitamin C, acetaminophen, other sugars than glucose.
- ✓ The fused enzyme has a two-fold higher affinity to glucose than the native enzyme, is stable and will be a good replacement also for continuous blood glucose monitoring.

Patent Status

Patent pending

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