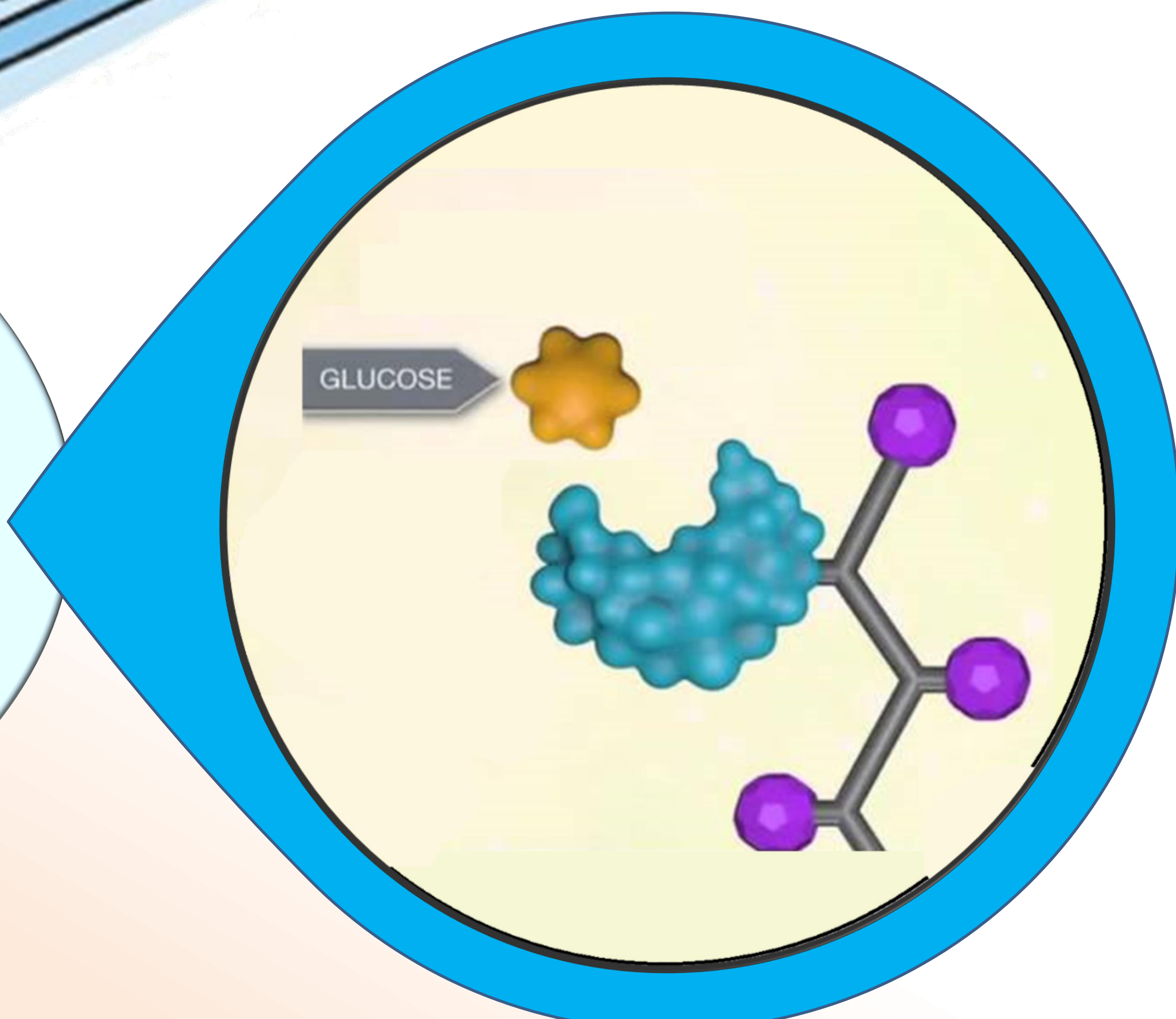
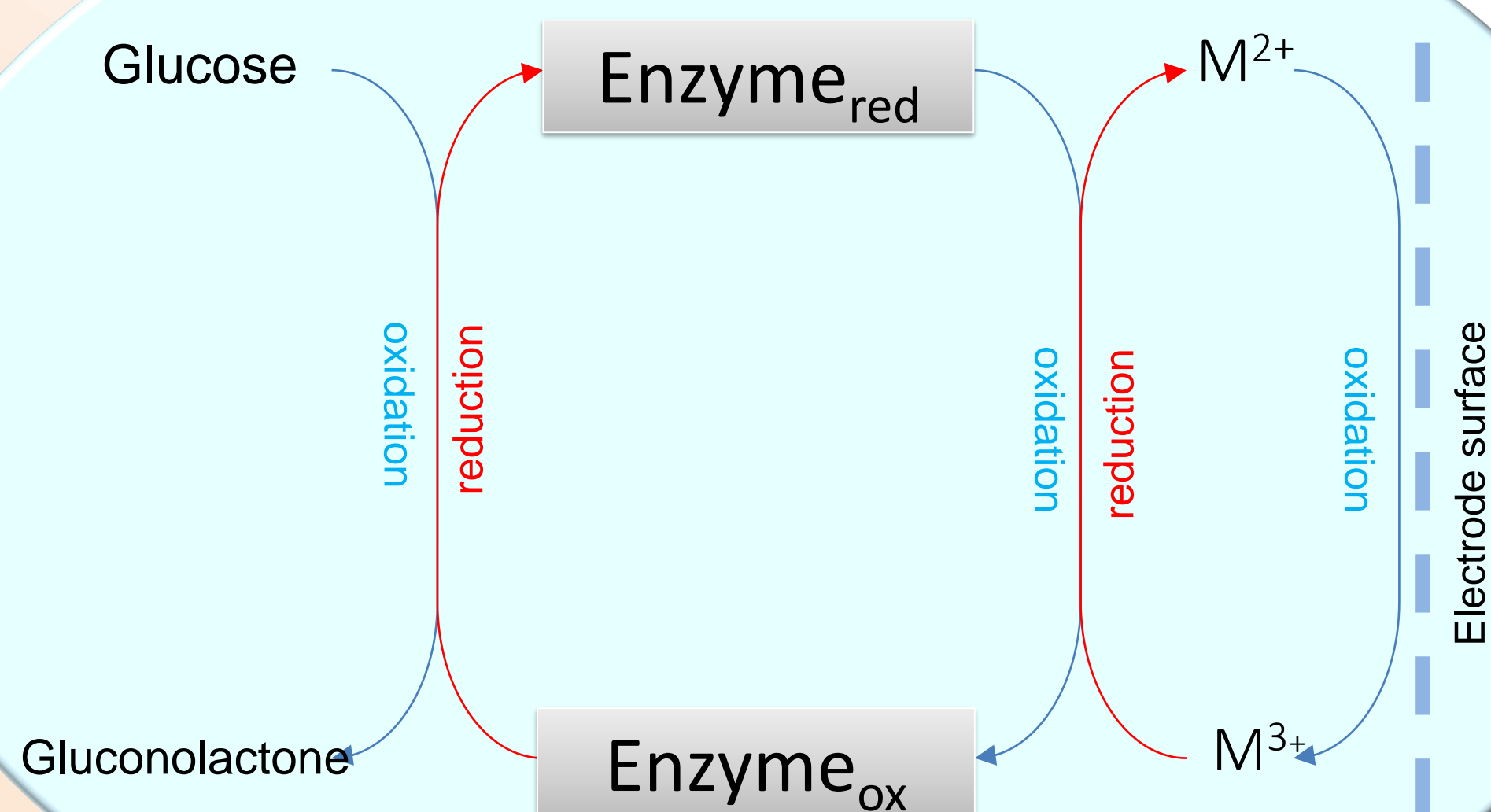
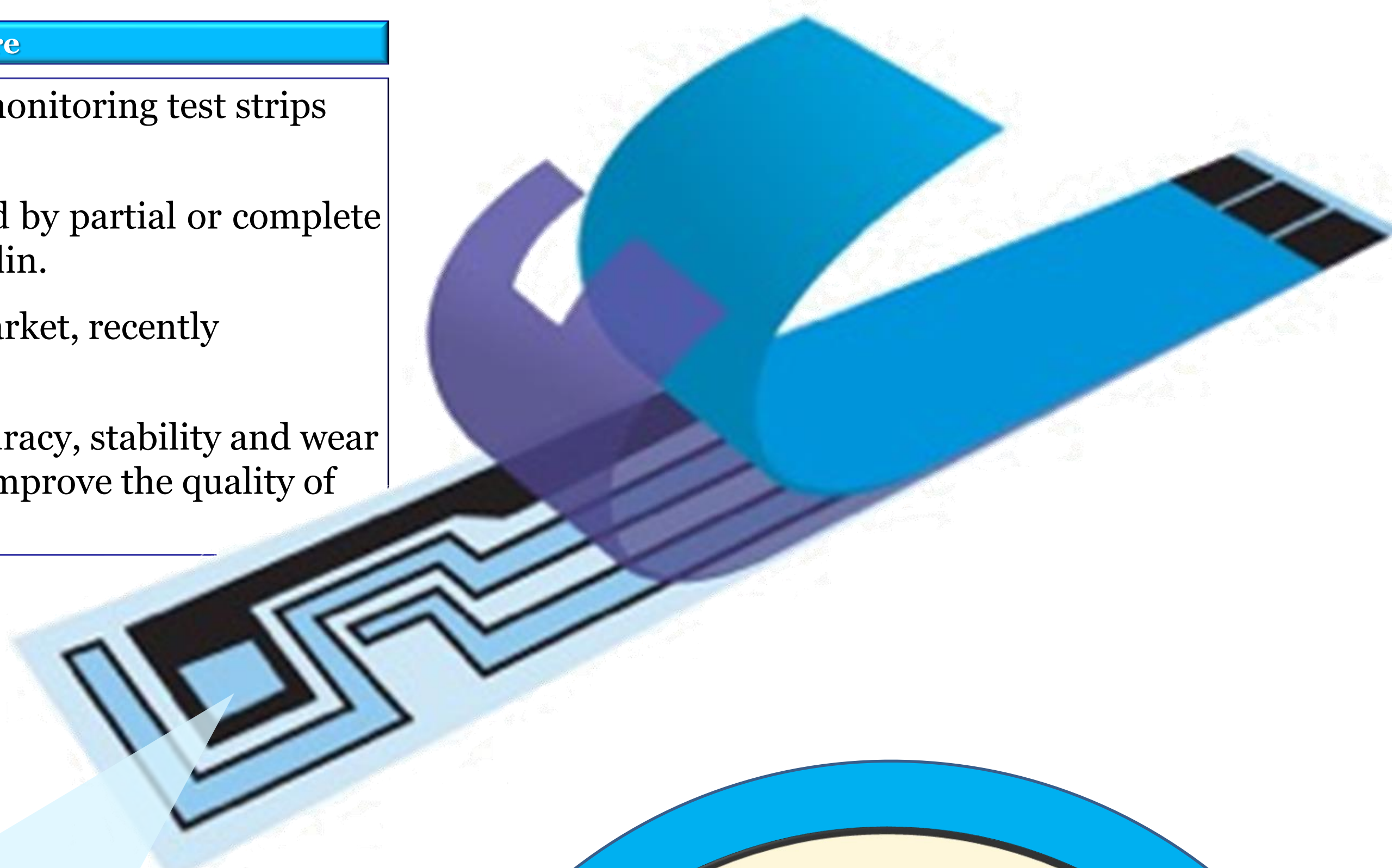


1. Introduction to Abbott Diabetes Care

- Abbott Diabetes Care (ADC) produces blood glucose-monitoring test strips and devices for those living with Diabetes Mellitus.
- Diabetes is a chronic metabolic condition characterised by partial or complete inability to produce (type 1) or respond to (type 2) insulin.
- ADC is the current global market leader in the CGM market, recently overtaking Roche for the first time in history.
- Future innovation at ADC looks to improve sensor accuracy, stability and wear duration as well as allowing dual-analyte detection to improve the quality of life for patients with diabetes.



2. Freestyle Libre

- ADC's glucose monitoring sensors use a combination of electrochemistry and catalytic chemistry via a process known as Wired Enzyme™ technology to determine the concentration of glucose in blood.
- The sensor contains an immobilised enzyme which oxidises glucose in the blood to gluconolactone, releasing an electron.
- The electron is passed through an electron transport chain via a redox-active organometallic polymer mediator.
- The mediator is attached to a carbon-based electrode system which carries a current to a chip where the current is translated into a glucose concentration.

3. Roles and responsibilities

Some of the areas of chemistry I've utilised this year have included:

- Surface tension and colloids.
- Polymer synthesis.
- Redox chemistry.
- Electrochemical spectroscopy.
- Energy-dispersive X-ray spectroscopy.

Other skills I've developed include:

- Experimental design.
- Report writing, including FDA submissions.
- Good lab practice for medical devices.
- Data analysis, modelling and coding.
- Process automation.

4. My achievements

Over the course of the year, my independent work has contributed to:

- A new calibration method using electrochemical impedance spectroscopy.
- Full characterisation of product stability up to 19 months.
- Determination of polymerisation mechanism.
- Automation of product shipping.
- Automation of product testing analysis.
- Automation of manufacture process tracking.
- Automation of new manufacturing machine.
- Design of new quality control machines.
- FDA approval for Freestyle Libre 2.
- Concept designs for next-generation Freestyle Libre.