# Roslyn Bill

**Professor of Biotechnology at Aston University**
Birmingham, , GB

Professor Bill's research on water flow in the body has revealed how to develop drugs that prevent brain swelling after injury or disease.

## Biography

Membrane proteins are the targets of over half of all prescription pharmaceuticals. I am an international authority on the synthesis and characterization of membrane proteins for biochemical, biophysical and structural analysis, which is the basis of modern drug discovery. My scientific focus is on aquaporin water channels (AQP), G protein-coupled receptors and tetraspanins. In 2009, I led the multidisciplinary team that discovered a novel pathway that controls the permeability of cells to water. I have published a suite of articles describing this regulatory mechanism for human AQP1, 3, 4 and 5. These findings provide the foundation of understanding the mechanistic basis of water imbalance. After a stroke or a traumatic head injury, the brain swells. This affects tens of millions of people every year. This swelling, known as ?cytotoxic oedema?, can lead to death, disability and an increased risk of neurodegeneration with ageing. This is what happened to Michael Schumacher after his skiing accident in 2013. Current clinical treatments are crude and limited to symptom management. They include removal of part of the skull to allow the brain space to swell or the use of chemicals to draw water out of the brain tissue; these treatments are risky, especially for older patients. My team has discovered how water enters the brain and how to stop this happening after an injury. This means we can develop medicines to stop cytotoxic oedema developing and therefore reduce the need for life-threatening surgery. Excitingly, we have identified a compound that is already licenced in humans for another purpose. I am actively working towards testing whether it can be used as an anti-cytotoxic oedema medicine in a clinical trial.

## Areas of Expertise

Membrane Proteins, Brain Swelling, Water Balance, Healthy Ageing, Brain Injury

## Affiliations

BBSRC Research Committee E: Chair, Biotechnology Letters : Editorial Board Member, Molecular Biotechnology : Editorial Board Member, BBA-Biomembranes : Editorial Board Member, Membranes : Editorial Board Member, Microbial Cell Factories : Editorial Board Member

## Education

**University of Oxford**
DPhil

**University of Oxford**
MA Natural Science (Chemistry)

**University of Oxford**
BA Natural Science (Chemistry)

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