

---

**Conference presentation**

## **Why is catalase do fast?**

Lionel Milgrom

Program for Advanced Homeopathic Research, London, United Kingdom

**Introduction:** Conventional (reductionist) biochemistry is like a theatrical performance: our attention is on the main 'actors'; nucleic acids, proteins, lipids, etc. Little attention is paid to their 'theatre of operations', the cell's inner aqueous/semi-aqueous environment, which nurtures and ultimately enables all their intricate coordinated reactions. In this talk, I will show how by making these aqueous-mediated relationships more explicit, a holistic (more homeopathically friendly) understanding of enzyme action is possible, that does not contradict known text-book enzyme kinetics.

**Purpose of Study:** As vital parts of our immune systems, catalases are some of the most efficient enzymes known, breaking down dangerous hydrogen peroxide ( $H_2O_2$ ) at around tens of millions of molecules per second. Conventional biochemistry suggests this reaction rate depends on a random, diffusion-limited mechanism in which  $H_2O_2$  molecules meander through the cellular aqueous medium, down channels from the enzyme surface, into its reactive sites. It is difficult to square this mechanism with the phenomenal rapidity of catalase kinetics.

**Method:** An alternative mechanism is proposed in which catalases act as epicentres of an extended network of hydrogen-bonded water and  $H_2O_2$  molecules, stretching out far beyond the enzymes' active sites, into the cell's internal aqueous medium. As catalases function, they provide coherent oxidative 'pulses', which rapidly spread throughout the H-bonded network, effectively 'unzipping'  $H_2O_2$  molecules as far as they extend from the enzyme.

**Result/discussion:** This 'memory-of-water'-like mechanism predicts catalase  $H_2O_2$  disproportionation should occur outside the enzyme. An experimental protocol is proposed to test this prediction. If successful, it would suggest a) holistic re-appraisal of the conventional mechanistic framework of enzyme kinetics is required, and b) should encourage more research into understanding the biochemical effects of CAM therapies.

**Keywords:** Holistic biochemistry; catalase enzymes; hydrogen peroxide disproportionation; hydrogen-bonded networks; memory of water.

© International Journal of High Dilution Research.  
Not for commercial purposes.