‘How do we sleep?’

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Host: Professor John Wood

Bill Wisden did his PhD with Steve Hunt at the MRC Molecular Neurobiology Unit, Cambridge, followed by a period in Peter Seeburg's lab at Heidelberg. He returned to the MRC LMB Cambridge as a group leader in the mid-1990s, followed by a return to Heidelberg, then to a Chair in Aberdeen, and finally in 2009 to a Chair in Imperial College London. He has worked extensively on neurotransmitters receptors (GABA, AMPA, kainate receptors).

More recently, he has changed fields within neuroscience, and has become interested in sleep. In collaboration with Nick Franks at Imperial he has used mouse genetics to investigate how inhibition regulates the sleep-wake circuitry and the actions of sedative drugs, and has deployed a technique known as activity-tagging, or TetTagging, based on c-fos expression, for tracing and probing ensembles of neurons activated during sleep and by sedative drugs.

Their major overarching question is: what mechanisms and neural circuitry make sleep inescapable when we are tired and deprived of sleep? In fact, the drive to "recovery sleep" after prolonged sleep deprivation seems so strong, that it is similar to taking a sedative drug. So, their second major question is: do sedative drugs cause loss of consciousness by activating the same mechanisms and circuitry responsible for this deep recovery sleep?