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Heavy Water as a Novel Treatment for Mood Disorders

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A functional definition of "mood" highlights the significance of circadian rhythms in the evolutionary history of mood. Mood disorders in humans are highly correlated with abnormal and desynchronized circadian rhythms of neuroendocrine and sleep/wake cycles, which return to normal with remission of depression. Two validated and replicated chronobiological treatments—light therapy and early-awakening therapy—suggest that chronobiological interventions correct underlying causes of depression. One characteristic of these treatments is that when they do work, they work quickly, suggesting a direct action upon a primary etiological factor. The "master clock" that controls and synchronizes mammals' circadian rhythms is the Suprachiasmatic Nucleus in the brain. The first substance known to penetrate the SCN and alter circadian rhythms was deuterium oxide ("heavy water"). Heavy water is an ideal chronopharmaceutical in that the deuterium isotope's chemical properties differ from the protium hydrogen isotope almost solely in the kinetics of its reactions. Over the past five decades, the biological effects of heavy water have been thoroughly studied, including a dose-response relationship for altering circadian rhythms in mammals. Safety thresholds have been generally accepted for numerous species, including humans. An acute dose high enough to reset and resynchronize human circadian rhythms is approximately 15 times less than the dose considered a safe threshold for chronic heavy water ingestion. A falsifiable hypothesis derived from the chronobiological theory outlined above is that heavy water's effectiveness in an animal model of depression is underway at UCLA Behavioral Treatment Core.

Biography

Ulwelling William ia an MD, MPH in UCLA Medical Center in United States of America Experimental Hypothesis: Deuterium Oxide is a safe, rapidly-acting treatment for Major Depressive Disorder Proposed Experimental Design Patent Protection and Marketing Factors.