

Investigating *Daphnia magna* Response to Sleep Aids as an Indirect Correlation With Humans

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The hearts of humans as well as *Daphnia magna* are striated and neurogenic. In humans, substances that induce sleep also lower blood pressure and heart rate. Research indicates that when *D. magna* is in a resting state, the heart rate decreases as well. Question: When exposed to common over-the-counter (OTC) sleep-aids, which one will decrease the heart rate of *D. magna* the most without increasing mortality after 40 minutes of exposure? Different percentage solutions were created from the following independent variables: Diphenhydramine with 10% alcohol, Diphenhydramine, Naproxen with diphenhydramine, Doxylamine succinate, Melatonin, Valerian root, Cabernet Sauvignon, Beer, Chamomile tea, Sleepytime tea, Sleepytime-extra tea, Lavender tea, Lavender-Chamomile tea. Heart rates of *D. magna* were calculated after exposure to each solution for 10 then 20 minutes, with mortality rates of *D. magna* assessed at 40 minutes. Hypothesis: When exposed to common OTC sleep-aids, the heart rate of *D. magna* exposed to Melatonin 5% solution will decrease the most after 20 minutes with no increase in mortality after 40 minutes. Results: *D. magna* exposed to Valerian Root 1% solution for 20 minutes achieved the lowest mean average heart rate of 130 with no increase in mortality after 40 minutes. The mean heart rate of the *D. magna* exposed to Valerian Root 5%, 1%, and 0.5% solutions combined results was 143 with no increase in mortality after 40 minutes as well. *D. magna* exposed to Melatonin 5%, 1%, and 0.5% solutions, mean average heart rate was 158 with no increase in mortality after 40 minutes.

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