

# Critical thinking on anatomy and hormone identity

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In a study in 1982, Rosenblatt et al. described following the antibody levels produced against rubella in one patient over seven years (81). They found that the levels cycled in a regular pattern over 365 days, suggesting that the production of antibodies by the immune system varied in a regular way according to season. Another study has found a correlation between melatonin levels and antibody production in mice (Cernysiov et al., 25). Because these cycles could have implications for the timing of voluntary treatments, such as vaccinations, it would be useful to determine if this is actually the case in humans with a study size larger than one subject and in more than one antibody. Additionally, since funding, testing facilities, and willing graduates students are all available, a test could be done if the primary variable in this seasonal change in antibody levels is due to variations in exposure to light.

The study design would require having two groups of subjects living in the provided testing facilities for several years. The primary measurement of the experiment would be weekly measurement of antibody and melatonin levels for several different diseases of which all the subjects had been either naturally exposed or vaccinated, such as chicken pox, measles, mumps, and rubella. Measurements would be done at the same time each week. Subjects having no titer to one of the test antibodies would be ineligible. Throughout the year, exposure to artificial light would be tightly controlled for both groups, but one group would have variations in their "lights on and lights off" time such that it resulted in a consistent number of hours of light each day no matter what the season, while the other would have a shifting "lights on and lights off" pattern such that the most light would be during the summer, lesser in spring and fall, and the least during winter. Patterns in the <https://assignbuster.com/critical-thinking-on-anatomy-and-hormone-identity/>

amount of antibody over the year would be tracked and it would be seen whether the variation in light exposure between the two groups altered the antibody level pattern. Melatonin levels could also be factored in. Results from this study could help maximize the timing of vaccinations such that the highest titers of antibodies would be available at the peak time for infection, for example, with the annual influenza vaccination.

## **Works Cited**

Cernysiov, Vitalij et al. " Regulation of T-cell-independent and T-cell-dependent Antibody Production by Circadian Rhythm and Melatonin." *International Immunology*, 22. 1 (2010): 25-34. Web. 27 June 2013.

Rosenblatt, Leon et al. " A Circannual Rhythm in Rubella Antibody Titers." *Journal of Interdisciplinary Cycle Research*, 13. 1(1982): 82-88. Web. 27 June 2013.