

# Replace Toxic Fluorescent Light with Natural Light Now!

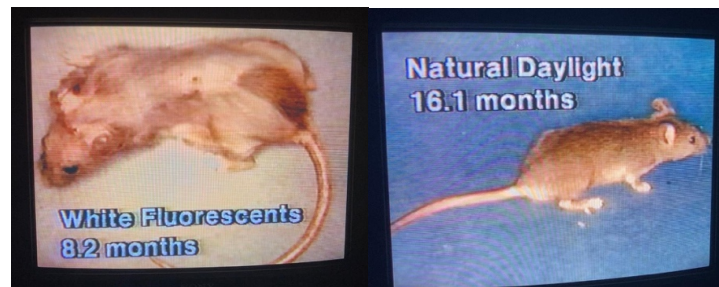
by Robert K. Stevenson

If you knew that daily exposure to a particular toxin would reduce your lifespan by 50%, would you choose to expose yourself to that toxin? With this knowledge most likely you would choose to avoid exposure to such a toxin. But, what if you did *not* know that daily exposure to that toxin would significantly reduce your lifespan? That regrettably is the situation hundreds of millions of children and adults find themselves in. What all these people have in common is that they occupy for much of the day an indoor setting—school classroom, office at work, store, factory, etc.—which is lit by fluorescent light.

Fifty years ago, Dr. Jon Ott conducted a classic study of the effects of both fluorescent light and natural outdoor light on the life of C3H mice (strongly inbred, cancer-prone mice, commonly used in lab experiments)<sup>1</sup>. The results were:

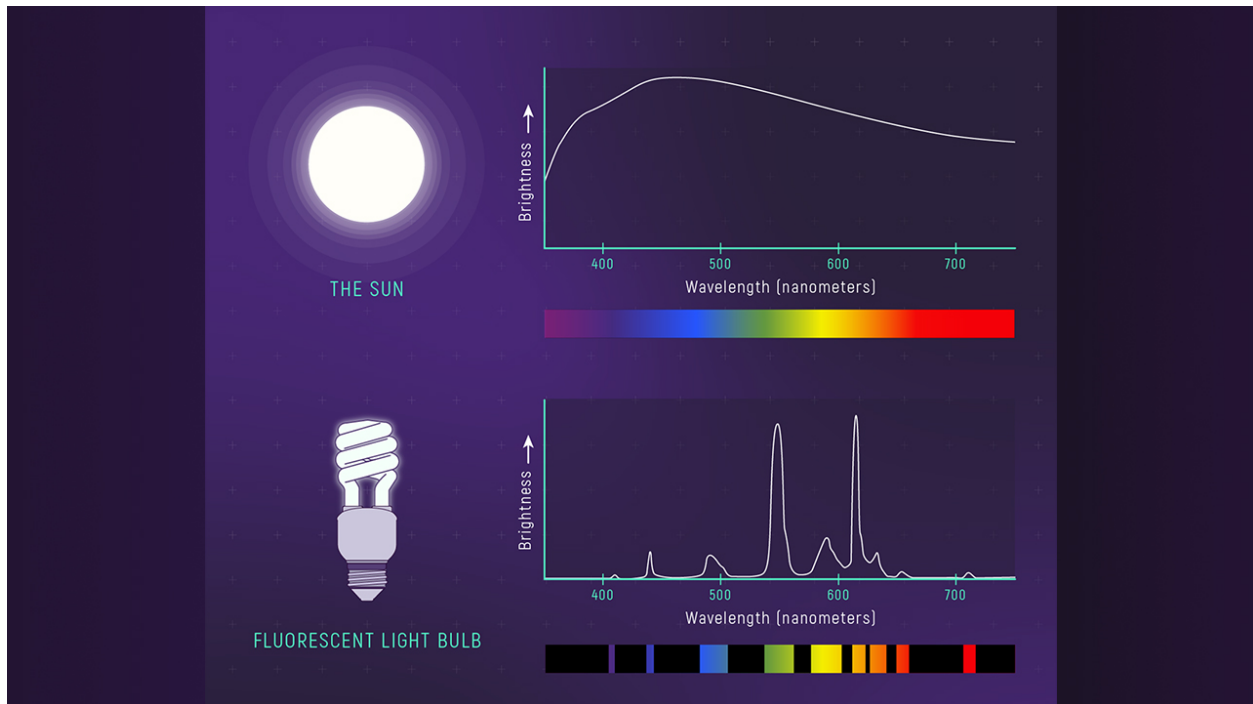
	Average Lifespan of Mice
Fluorescent Light	8.2 months
Natural Outdoor Light	16.1 months

As you see, the mice living under fluorescent light lived only half as long as the mice living under natural outdoor daylight. In a related study by Samuel Gabby, MD which also utilized C3H mice, a group of 30 pairs of mice exposed to fluorescent light developed cancer 2 months before the study's control group of 8 pairs who were only exposed to daylight through clear glass windows. By the conclusion of the study all 30 pairs of fluorescent light exposed mice had died, while 2 of the 8 pairs of the daylight-exposed control mice still survived<sup>2</sup>.



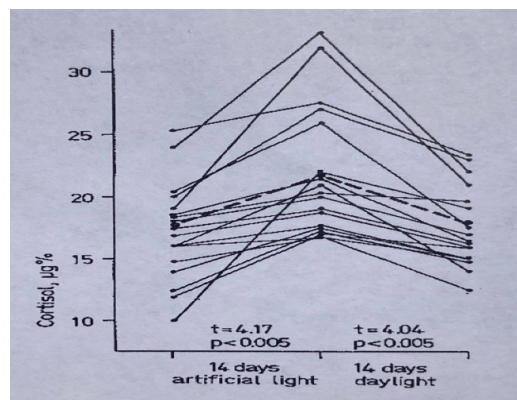
Lifespan of lab mice exposed to fluorescent or natural daylight

The alarming results of these two studies make sense once one understands the obvious: life on our planet was formed and evolved under sunshine (natural daylight) and not under fluorescent light. As the below illustration shows, these two forms of light are, in fact, vastly different. Natural daylight is full spectrum, meaning it contains all the colors of the rainbow as well as colors that we cannot see, such as infra-red and UV (ultraviolet). In addition, the wavelengths of the various colors manifest themselves in a fairly-balanced manner. By contrast, the colors contained in fluorescent light present themselves in an extremely unbalanced way, with some color wavelengths hardly existing at all. It is no coincidence therefore that regular exposure to the bizarre fluorescent light color spectrum quite negatively affects the health of not just mice, but also other mammals, such as us—humans!



### Color spectrum of daylight and fluorescent light

In 1979 Dr. Fritz Hollwich conducted an experiment on a group of 16 high school to college age volunteer individuals wherein for the first 14 days the subjects were exposed to artificial light—specifically, cool-white fluorescent light. The purpose of the experiment was to see what impact the fluorescent light had on the body’s two main stress hormones—cortisol and ACTH. As you see in the below graph, by Day #14 the cortisol level of all these individuals had increased. The same thing happened to the individuals’ ACTH level. And, the increased level of cortisol and ACTH was not a minor increase. Just the opposite. Hollwich points out that the two weeks exposure to fluorescent light produced “stress-like levels of ACTH and cortisol.” On Day #15 normal daylight replaced the fluorescent light, and after 14 days of exposure to daylight the cortisol and ACTH levels had significantly decreased and had by-in-large returned to the original stress-free starting point in all the individuals.



The experiment's results were so striking that Hollwich found it necessary to conclude his paper's Abstract with this recommendation to those overseeing the education of children:

**“These findings explain the agitated mental and physical behavior of children staying the whole day in school under artificial illumination with strong spectral deviation from daylight.** Therefore, to avoid mental and physical alterations, the spectrum of artificial illumination should be largely similar to that of natural light.”<sup>3</sup>

Now, we know how pervasive fluorescent light is. We see it overwhelmingly present in school and college classrooms, offices, stores, factories and other indoor settings. At the same time we continue to experience year in and year out a hyperendemic level of two hormone-dependent cancers in the US—breast and prostate cancer, with an average of 1 out of 8 women and 1 out of 8 men coming down during their lifetime with breast and prostate cancer respectively. Can this high breast and prostate cancer rate be related to the ubiquitous use of fluorescent lighting?

Dr. Alexander Wunsch, in his April, 2006 *Journal of Optometric Phototherapy* paper, “Artificial Lighting and Health,” provides us the answer. Dr. Wunsch begins by pointing out that “there is one very important hormone that is produced directly in the skin under the influence of ultraviolet radiation: Vitamin D.” He next informs us that fluorescent light has a high color temperature of 2700-4000 kelvin whereas, for example, a candle (1500 kelvin) and incandescent light (2000-2600 kelvin) do not. Exposure to such high color temperature light fools the brain, and repeated exposure greatly increases one's chances of developing serious, if not fatal, health conditions. Dr. Wunsch explains:

“The problem that occurs is that when we use artificial light sources with high color temperatures, that tells the energetic pathway through the eye that there is a high amount of UV outside. The organism starts producing new stress hormones and is waiting for soltriol [ed. -- another name for Vitamin D] – but soltriol is not forthcoming, and existing stress and sex hormones are not destroyed because there is no UV in the light and the skin is covered by clothes. **The result is an increase of stress and sex hormones with typical consequences for health under long-term conditions: cardiovascular disease and hormone-dependent cancers.**”

Now, fluorescent light exposure does not only significantly increase one's risk of developing breast and prostate cancer. It also has been found to significantly increase one's risk of developing melanoma. Valerie Beral and three co-researchers published a paper in *The Lancet* in 1982 reporting the results of their study of 274 women with malignant melanoma, ages 18-54 years, and 549 matched controls. **“Reported exposure to fluorescent light at work,”** the researchers state, **“was associated with a doubling of melanoma risk.** The risk grew with increasing duration of exposure to fluorescent light and was higher in women who had worked mainly in offices”—the increased risk of developing melanoma for this group being 160%.<sup>4</sup>

What is it about fluorescent light exposure which contributes to the development of melanoma? Samuel Milham and Dave Stetzer published a paper in the July, 2018 issue of *Medical Hypotheses* where they provide an answer to this question. In their study they took a “measurement of body amperage in humans exposed to modern non-incandescent lighting. **People exposed to old and new fluorescent lights, light emitting diodes (LED) and compact fluorescent lights (CFL) had body amperage levels above those considered carcinogenic.**” Most alarmingly, Milham and Stetzer concluded that “modern electric lighting is a significant health hazard, a

carcinogen, and is causing increased cutaneous malignant melanoma incidence in indoor office workers.”<sup>5</sup>

Obviously, we do not want to start children off early in life on the road to developing breast cancer, prostate cancer or melanoma. So, what would happen to children attending schools whose classrooms were primarily lit by daylight, and not by fluorescent light?

The California Public Utilities Commission wanted to learn the answer to this question, and in 1987 funded a comprehensive study of daylighting’s impact on 2<sup>nd</sup> through 5<sup>th</sup> graders in three different school districts. The study’s researchers produced a 29-page-long report, published in 1999, titled “Daylighting in Schools: An Investigation into the Relationship Between Daylighting and Human Performance.” The researchers found “that students with the most daylighting in their classrooms progressed 20% faster on math tests and 26% faster on reading tests in one year than those with the least.” The greatest improvement in the students’ math and reading scores occurred in classrooms that contained a unique, good-sized skylight, which the researchers called Skylight Type A. Skylight Type A possesses a diffusing lens which spreads the daylight evenly throughout the classroom. In addition, this skylight is manually controlled via dimming louvers, allowing a teacher, if necessary, to dim the skylight (in order to show movies, for example).



**Classroom lit by skylight possessing a diffusing lens.  
Note how the light is spread evenly throughout the classroom.**

All by itself, Skylight Type A with its diffusing lens resulted in, as the researchers reported, “a 19% to 20% faster improvement when compared to classrooms with no skylights.” Equally importantly, the researchers found that a type of skylight which only allows patches of light to enter a room caused a “21% decrease for reading tests and no significant results for math tests,” an outcome the researchers attributed to “the glare caused by sunlight splashing on the classroom walls.” So, don’t obtain this type of skylight for your home or place of work; instead install only a skylight possessing a diffusing lens that spreads the daylight evenly throughout the room. The “Daylighting in Schools” study researchers concluded by reporting what students attending schools that used diffusing lens type of skylights alongside some side windows in the classroom would likely experience: **“Students in daylight classrooms could save up to one month of**

## **instruction time in the reading and math curriculum that could be used for other areas of learning.”**

Given that fluorescent light is harmful to health and natural light is beneficial, what about LED light? Unfortunately, LED lighting is, just like fluorescent lighting, not the solution. Dr. Wunsch urges one, “as a rough rule of thumb,” to avoid any type of artificial light that has a high color temperature. He provides a table in his paper showing the color temperature and true temperature of various forms of light. Incandescent light, for example, possesses a color temperature of 2000-2600 Kelvin and a true temperature of 1730-2330 Celsius. By contrast, white LED light, which is often used for outdoor or indoor lighting, possesses a very high color temperature of 4500-10000 Kelvin but a very low true temperature of <100 Celsius. “Another indication of unnatural light,” Wunsch states, “is the difference between color temperature and true temperature,” and as we see, whereas there is an enormous difference between the color temperature and true temperature of white LED light, there is but a small difference between the two temperatures of incandescent light. How do these color and true temperature levels affect the human body? Wunsch reports: 1) that high color temperature light such as white LED light significantly increases one’s level of ACTH and other stress hormones (which he calls “steroids”), which is the same result reported by Hollwich in his study of fluorescent light’s effect on the body’s stress hormone level, and also is what Wunsch earlier stated leads to the development of cardiovascular disease and hormone-dependent cancers (such as breast and prostate cancer), and 2) that the white LED light produces a profoundly negative chronobiological effect on one exposed to such light, but incandescent light exposure produces no negative chronobiological effect.

Keeping in mind the tremendous health and learning benefits received by students occupying classrooms containing plenty of windows as well as a diffusing lens-equipped skylight, it should come as no surprise that the California Department of Education’s Guiding Principles for new school construction and rehabilitation states the following: “The siting and design of educational facilities will incorporate superior acoustics, indoor-air quality, and **natural lighting.**” Share this report with your local state legislator, school board or school principal. Encourage your representative to provide funding for the installation of one or more skylights that diffuse daylight evenly throughout each classroom of your child’s or community’s schools. And by all means, eliminate any fluorescent lights or LED lights that might currently exist in your home. Replace them with incandescent light bulbs, which are readily available from many internet merchants or, if possible, install one or more diffusing lens type of skylight to provide you the needed, healthy replacement lighting. And don’t forget how much the light you receive and use from a skylight will cost you on your electric bill—\$0.

### **References**

1. Jon N. Ott (1973), *Health and Light: The Extraordinary Story That Shows How Light Affects Your Health and Emotional Well-being*, Ariel Press.
2. Samuel L. Gabby (1961), “Observations on the effects of artificial light on the health and development of mice,” cited by Jon N. Ott (1982), *How to Stay Healthy*, Devin-Adair, pages 99-100.
3. Fritz Hollwich and R. Dieckhues, “The Effect of Natural and Artificial Light via the Eye on the Hormonal and Metabolic Balance of Animal and Man,” *Ophthalmologica*, (Basel 180, 1980, pages 188-197).
4. Valerie Beral, Helen Shaw, Susan Evans, Gerald Milton, “Malignant Melanoma and Exposure to Fluorescent Lighting at Work,” *The Lancet*, (Vol. 320, Issue 8293, August, 1982, pages 290-293).

5. Samuel Milham and Dave Stetzer, "The electronics in fluorescent bulbs and light emitting diodes (LED), rather than ultraviolet radiation, cause increased malignant melanoma incidence in indoor office workers and tanning bed users," *Medical Hypotheses*, (Vol. 116, July, 2018, pages 33-38).