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Set deep in our brains is a tiny gland called the pineal gland. This tiny gland is in charge of the endocrine system, the glandular system that controls most of our bodily functions. The pineal runs our body clocks, and it produces melatonin; the hormone that may prove to be the biggest medical discovery since penicilin, and the key to controlling the aging process. The pineal gland controls such functions as our sleeping cycle and the change of body temperature that we undergo with the changing seasons.

It tells animals when to migrate north and south, and when to grow or shed heavy coats. By slowing down and speeding up their metabolisms, it tells them when to fatten up for hibernation, and when to wake up from hibernation in the spring. Melatonin is the hormone that controls not only when we feel sleepy, but the rate at which we age, when we go through puberty, and how well our immune systems fend off diseases. Being set in the middle of our brains, the pineal gland has no direct access to sunlight. Our eyes send it a message of how much sunlight they see, and when its dark. The sunlight prohibits the gland from producing melatonin, so at night, when theres no sun, the sleep-inducing hormone is released into our bodies. Because of the pineal gland and melatonin, humans have known to sleep at night and wake during the day since long before the age of alarm clocks. Humans dont produce melatonin right from birth; it is transfered in utero to babies through the placenta.

For their first few days of life, babies still have to receive it from breast milk. Our levels of melatonin peak during childhood, then decrease at the beginning of puberty, so that other hormones can take control of our bodies. As we get older, the amount of melatonin we produce continues to decrease

until at age 60, we produce about half as much as we did at age 20. With the rapid decrease from about age 50 on, the effects of old age quickly become more visible and physically evident.

With what scientists have recently discovered, we may very soon be able to harness melatonin to slow down aging, fend off disease, and keep us feeling generally healthy and energetic; not to mention the things melatonin can do for us right now like curing insomnia and regulating sleeping patterns, eliminating the effects of jet-lag, and relieving every day stress. Melatonin is known as the regulator of regulators, because it sends out the messages that control the amounts of all the different hormones in our bodies. It is a balance among our different hormones that keeps us healthy, and as we age, our different hormone levels can become unbalanced, which results in aging. Everything our bodies do requires energy, from running a mile to sitting still and just breathing. Every cell in our bodies requires at least some energy to function. Within all of our cells are microscopic structures called mitochondria. Mitochondria are considered the powerhouses of the cells, because they convert energy into ATP; the substance which fuels most every cell in our body.

In order to create ATP, we need to take in and burn oxygen. As we age, our mitochondria age, and as our mitochondria age, their production of ATP slows, which results in the buildup of excess oxygen. This buildup results in the oxidization, (or rusting) of the cells and their different components. This is why when were older, we dont have as much energy as when were young. Heres where melatonin steps in. Melatonin metabolizes the thyroid hormone

(which supplies energy to the mitochondria, among other cell organelles) so that it carries more energy.

When the mitochondria receive more power from the thyroid hormone, they can produce more ATP, giving more energy to every cell in our bodies, and they use up all of the oxygen that we take in, so that our cells dont begin to oxidize. There are mitochondria in the cells of the pineal gland, which give it the power to produce and secrete melatonin. Pineal function declines as its cells mitochondria provide it with less ATP, and instead start