Role of thyroid hormones in slumber under investigation

August 8 2007

While the thyroid has long been linked to metabolism, cutting-edge research underway at Rutgers University—Camden is investigating the possibility that thyroid hormones have an important role in sleep regulation.

Thanks to a $415,369 grant from the National Science Foundation, a team of Rutgers-Camden researchers will pinpoint precisely how and when thyroid hormones influence the brain's sleep-related structures. Findings could yield new knowledge on a previously unknown sleep-regulatory substance and potentially answer why existing sleep medications aren't the cure-all for everyone.

Joseph V. Martin, a professor of biology, is the principle investigator and Alex Roche, an associate professor of chemistry, is the co-principal investigator of the ambitious project at Rutgers-Camden.

A diagnosis of thyroid cancer in 1991 inspired Martin's in-depth studies of thyroid hormones for over a decade. Martin has been cancer-free since the removal of his thyroid gland, but his need to compensate for its absence with pills has been educational.

"I have to adjust the dose regularly with my doctor. If it's too high, I have sleeping problems, if it's too low there could be lethargy and weight gain," he points out.

Martin's professional research has informed his own understanding of

his condition. Once he became aware of thyroid hormones' effect on the brain, he saw connections to his own life and to unsolved problems related to the role of thyroid hormones in the nervous system.

Martin's previous research established that in the adult brain, thyroid hormones act on receptors on the outside of cells, functioning like neurotransmitters. His findings contrast greatly with the well-documented functions of thyroid hormones, which are secreted from a gland located in the neck and increases cellular activity in nearly all tissues of the body by acting inside cells.

"Thyroid hormones do so much more than regulate weight. We're really just beginning to learn the true extent of how these hormones impact our overall health," Martin says.

The research underway at Rutgers-Camden will build on earlier findings by providing specific measurements of the levels of thyroid hormones and the compounds which are derived from them in the brain during circadian rhythms and during sleep and waking. Additional research will include observations of the effect of microinjections of thyroid hormones in sleep-related brain structures of rats.

As in the Rutgers-Camden scientists' previous research endeavors, undergraduate and graduate students will have an active role in this project.

Source: Rutgers, the State University of New Jersey