

# Yale Researcher Discovers "Brain Temperature Tunnel" That For The First Time Allows External Continuous Measurement of Brain Temperature

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**New Haven, Conn.** — Yale researcher M. Marc Abreu, M.D., has identified an area of the brain he calls the brain temperature tunnel, which transmits brain temperature to an area of skin and has the potential to prevent death from heat stroke and hypothermia, and detect infectious diseases such as Severe Acute Respiratory Syndrome (SARS).

Abreu, a postdoctoral fellow in the Department of Ophthalmology at Yale School of Medicine, found that a small area of skin near the eyes and the nose is the point of entry for the brain temperature tunnel. His research shows that this area is connected to a thermal storage center in the brain, and the area has the thinnest skin and the highest amount of light energy. He has constructed patches and eyeglasses designed to continuously measure brain temperature at this entry point.

Unlike other vital signs like heart rate, blood pressure and respiratory rate, which can be monitored continuously, core body temperature measurement cannot be currently measured continuously and non-invasively.

"With the discovery of the brain temperature tunnel, sunglasses and eyeglasses will serve not only visual function, but also functions that sustain and enhance human life and performance," said Abreu.

Abreu said this discovery could impact a host of health issues such as athletic performance and training, enhancing safety and performance of athletes, firefighters, members of the military and outdoor recreationists. Abreu said the discovery could also help protect the world food supply and improve food safety by continuous monitoring of infectious diseases in animals such as foot-and-mouth disease, bovine tuberculosis, anthrax and mad cow disease.

For those who are sick at home and in hospitals, Abreu said this discovery could also provide continuous temperature monitoring without the need for nurse intervention. "One of the most important causes of death is hospital infection, which kills more than 100,000 patients a year in the United States," said Abreu. "The inability to detect temperature changes in a timely fashion can lead to spread of infection and even cause death. Monitoring the brain temperature tunnel can detect infection early, so timely therapy can be administered and complications prevented."

Abreu said, "The brain temperature tunnel has enabled the creation of systems that enhance performance while maximizing safety in hot or cold temperatures and preventing dehydration or overhydration."

Abreu explains that when athletes, military personnel, construction workers and firefighters die from heat stroke, it is because the brain temperature rises rapidly to dangerous levels and lack of timely detection and intervention causes brain damage. He further explains that physical performance is decreased because the blood is used for cooling the body. The high temperature in the brain can also lead to thermal induced injury and impaired cognitive function.

"Monitoring brain temperature will also enable women to use a natural method for tracking fertility and birth control," said Abreu. "Automated detection of ovulation can also enhance programs for artificial insemination in animals on dairy farms and in zoos."

Abreu can be reached at .

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