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A 'neurosteroid' found to prevent brain injury caused by HIV/AIDS

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A team of scientists from Canada, Thailand and Morocco have found that DHEA-S may prevent neurocognitive impairment that affects a significant percentage of AIDS patients. In a report appearing in the February 2013 issue of *The FASEB Journal*, they describe how a network of steroid molecules found in the brain, termed "neurosteroids," is disrupted during HIV infection leading to brain damage. This suggests that treatment with one of these steroid molecules, called DHEA-S, may offset the disruption caused by the virus to prevent or reduce brain damage.

"From these studies, we have gained a better understanding of how HIV injures the brain during AIDS, together with developing a new treatment approach for the resulting neurological disabilities arising from HIV/AIDS," said Christopher Power, M.D., co-author of this study from the Department of Medicine at the Medical Research Centre at the University of Alberta in Edmonton, Canada.

To make their discovery, Power and colleagues initially found that neurosteroid enzyme levels were suppressed in the brains of people with HIV/AIDS and that a neurosteroid molecule, DHEA-S, prevented damage to cultured brain cells (neurons) caused by HIV. Then, using an animal model of AIDS, they showed that treatment with DHEA-S prevented neuronal damage in the brain by reducing the adverse effects of HIV. Neurosteroids have already been proposed as treatments for epilepsy, head injury, post-traumatic stress disorder and depression, and these findings extend the potential treatment applications for

neurosteroid-related molecules.

"Most people know that AIDS wreaks total havoc on our immune systems," said Gerald Weissmann, M.D., Editor-in-Chief of *The* FASEB Journal, "but far fewer people know that the disease can also lead to noticeable brain damage. This research study offers an explanation why this occurs as well as a possible solution for preventing it. The next steps, of course, involve looking into whether or not people will benefit from some form of DHEA-S treatment."

More information: Ferdinand G. Maingat, Maria J. Polyak, Amber M. Paul, Pornpun Vivithanaporn, Farshid Noorbakhsh, Samir Ahboucha, Glen B. Baker, Keir Pearson, and Christopher Power. Neurosteroid-mediated regulation of brain innate immunity in HIV/AIDS: DHEA-S suppresses neurovirulence. *FASEB J* February 2013 27:725-737; doi:10.1096/fj.12-215079

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