

# **The Center For Modeling Optimal Outcomes® LLC**

*“The Think Tank for Creativity & Innovation”®*

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## **Factors for Dementia**

As explained on its web site [www.TheCenterNJ.com](http://www.TheCenterNJ.com), during its investigative process for applying neuroscience in business, The Center for Modeling Optimal Outcomes®, LLC (The Center), discovered a scientifically verifiable model for maintaining balance (homeostasis) between substances in the body.

For nearly two years, the Life Sciences group of The Center used the Model for Homeostasis to develop models of verifiable causal paths that can be utilized by the neuroscientific community to advance their research into neurodegenerative diseases.

Based on the analyses of the Life Sciences group, three primary categories of substances in the body emerged as being involved with the disruptions that lead to most, if not all, neurodegenerative diseases; i.e. amino acid neurotransmitters, enzymatic signal mechanisms and neurohormones.

Part of the information and models initially developed by the business group during their application of neuroscience in business identified the following pairing of neurohormones as being essential in order to maintain homeostasis in the brain:

<b><u>Focus</u></b>	Norepinephrine ----- Prolactin
<b><u>Fight</u></b>	Adrenaline ----- Cortisol
<b><u>Fear</u></b>	Aldosterone----- Oxytocin

When The Center’s business group referred their findings relative to neurohormones to the Life Science group, this basic information was used to expand its application into non-business models to be shared with the neuroscientific community.

Since the findings of the Life Sciences group are somewhat more complex than can be explained in this document, it is necessary to limit the focus of this document to dementia.

In order to understand how the aforementioned basic pairings are pertinent to multiple areas of focus within neuroscience, the following points should be considered:

- The thought processes that trigger the release of the appropriate neurohormones are survival driven; i.e. fight, fear and focus
- Each neurohormone has to have an “inhibitory pair” in order to offset the “excitatory” one; i.e. norepinephrine, adrenaline and aldosterone are excitatory.
- Both cortisol and aldosterone are corticosteroids that are known to cause cell death (apoptosis) in the hippocampus. Note: Cortisol is a glucocorticoid and aldosterone is a mineralocorticoid.
- In terms of thought processes, based on evolutionary physiology, each neurohormone is associated with the following: anxiety – fear (aldosterone), anger

– rage (adrenaline), attention – focus (norepinephrine), joy - contentment (oxytocin), calm – sadness (cortisol), socialization – awareness (prolactin).

By applying the dynamics associated with neurohormones, members of the Life Sciences group observed that the thoughts driven by stress (distress) and the process of offsetting anger released aldosterone and cortisol respectively could be primary factors for some causes of dementia. This realization was obvious because both neurohormones are known to cause apoptosis (cell death) in the hippocampus (the part of the brain attributed to memory).

Couldn't cell death in the hippocampus lead to memory loss? Couldn't distress (aldosterone) and sadness or the constant need to offset anger or resentment (cortisol) lead to dementia?

With dementia being one of the major neurodegenerative diseases, The Center believed it was important to pursue its investigative process in order to share it with the neuroscientific community. Using its findings as a foundation, The Center believes it is incumbent upon the scientific community to place a major emphasis on the role of imbalances in neurohormones as being one of the primary factors that can lead to some forms of dementia. It is for this reason that the information contained in this document is being provided without seeking remuneration in any form.

It should be noted that the Life Sciences group recognizes that multiple causes exist for nearly all illnesses and diseases. For example, the recent controversy in professional football concerning dementia in retired players is obviously attributable, at least in part, to Chronic Traumatic Encephalopathy (CTE) caused by head trauma. However, carefully analyzed, the incidences of dementia in many retired NFL players can also be attributed to excessive levels of the neurohormones cortisol and aldosterone.

Dr. Michael Miller, a Psychologist and a member of The Center's Life Sciences research group, observes that "besides the obvious increase in the level of physical contact, football players are constantly involved with survival level forces over the course of their careers." Players are constantly attacking or defending territory; in practice, in games, and even during mental rehearsal. This chronic "combat like – survival dynamic" existence affects neurochemistry (brain hormones), and, in Dr. Miller's opinion, can be a critical factor in the elevated incidence of cognitive decline that has been reported.

Miller referred to a May 2008 Harvard Business Review interview with brain expert John Medina in which the impact of stress on the brain was discussed. Medina stated "Certain types of stress can cause these hormones to overstay their welcome, and if they do, real damage occurs to the body, including your brain. The webbings between brain cells that hold your most precious memories can become disconnected. The brain can stop giving birth to new neurons."

Another member of The Center's Life Sciences group, Craig Angelini, a biological sciences advisor, reiterated the potential problems that can result from particular brain hormones associated with a chronic combat mentality. "Looking carefully at the six neurohormones associated with logic and emotions and aligning them into pairs to assess homeostatic relationships, interesting observations emerged. For example, the scientific community is already aware of the impact on the body when one's thoughts trigger the release of adrenaline. With a half life of approximately two minutes, this neurohormone provides an amazing boost

of energy to the body. From aspects of evolutionary physiology, adrenaline is the survival neurohormone released as a result of thought processes relative to defending or attacking. Unfortunately, little thought has been given to the brain chemical that has to restore calm after adrenaline is released. Based on our research into the alignment of neurohormones into pairs, cortisol emerged as the counterpart to adrenaline to restore calm and prevent a critical drain on the body's energy reserves necessary to sustain life."

To put the process into perspective, Miller added, "Professional football players stimulate thought processes play after play that build a level of energy that can trigger the release of adrenaline in order to physically dominate an opponent. Without calming and countering adrenaline, the body's pool of energy resources would be drained and the result would be major systemic failures."

In addition imbalances in neurohormones, The Center's Life Sciences group has also identified two other factors that are contributing to additional models that cause of dementia; one of which is the disruption of enzymatic signaling molecules that regulate beta amyloid. Based on these models, the Life Sciences group believes the community of neuroscientific researchers may be able to develop treatment regimens that could remediate some forms of dementia.

The Center recognizes that dementia is having a serious impact on more than retired professional football players. Accordingly, efforts are currently underway to select an academic research partner with which The Center can share its models relative to dementia and other neurodegenerative diseases that result from disruptions in homeostasis of substances in the body.

According to The Center's founder, William McFaul, "We are seeking an academic research partner(s) because our role is strictly to create models that can be used as tools by the research community to find answers. The Center does not conduct formal scientific research and we are not seeking grants or funding for sharing our findings. Only scientists will be able to use our tools to verify the impacts of disruption to homeostasis in bodily substances and to identify products or processes to prevent or remediate illnesses or disease entities.

To obtain additional information regarding The Center's model for homeostasis in the body relative to dementia or other neurodegenerative diseases, contact Linda Oliver-Perrier at [loliverperrier@TheCenterNJ.com](mailto:loliverperrier@TheCenterNJ.com)