

Vasoactive Intestinal Peptide is a neuropeptide found widely in tissues throughout the body including the small intestine, pancreas, vagina and brain. It relaxes smooth muscle and is a vasodilator and bronchodilator in the lungs. It also regulates the innate immune system. The innate immune response is a function of our more primitive immune system that some people use in order to defend against biotoxins. Unfortunately, the primitive immune system defense is releasing cytokines which end up promoting widespread inflammation everywhere in the body, including the brain (4). VIP has been used since 2008 in treating patients with exposure to water damaged buildings.

Although VIP is primarily known as a gut hormone it also acts as a neurotransmitter in the CNS. VIP is widely expressed throughout numerous brain regions, with the highest expression levels found in the cerebral cortex, hippocampus, amygdala, and hypothalamus, all regions where biotoxins such as mold may promote damage.

Alzheimer's Disease, perhaps the illness most feared by people as they grow older, is increasingly recognized as a neuroinflammatory condition. One of the most common causes of neuroinflammation is insulin resistance caused by excess sugar, and some have begun to wonder if Alzheimer's is actually Diabetes Type III (1,2). In addition cytokines such as TGF beta, a hallmark of biotoxin induced neuroinflammation, are elevated in Alzheimer's (3).

What many people using VIP on a regular basis don't realize is that *VIP also has widespread and potent neuroprotective effects. It has been shown to decrease neuroinflammation, excitotoxicity, and perhaps even protect against Alzheimer's.* Remember cytokines such as TGF beta, a hallmark of biotoxin induced neuroinflammation, are also elevated in Alzheimer's (3).

The neuroprotective properties of VIP are *facilitated by promoting the expression and secretion of astroglia-derived factors in the presence of toxins [8].* VIP can protect cells from neurotoxic effects of several toxins, including ethanol. *VIP has even been shown to limit microglia activation and the release of inflammatory neurotoxins such as Tumor Necrosis Factor. (9) Recently VIP was also shown to normalize the sleep cycle through its effect on the hypothalamus.*

Vasoactive Intestinal Peptide is available at three compounding pharmacies in the US. It must be ordered and supervised by a physician. Side effects can include mild irritability, headache, dizziness. Starting slowly at one intranasal spray taken while seated is helpful. When the symptoms subside slowly add the next spray. Most people are able to tolerate the full dosage by using this method. If the symptoms do not subside ask your physician for lower dosage. Another side effect can be a rise in pancreatic lipase. Make sure that when your lipase is tested you are fasting and have not use digestive enzymes for the last two days. Oh, and another side effect that is not rare – feeling good and energetic. If that happens do not take off a run a marathon the patient who did that was sorry later 😊

Now that's a bonus for "moldy brains"!

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<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2769828/>
2. Eikelenboom P, van Exel E, Hoozemans JJ, Veerhuis R, Rozemuller AJ, van Gool WA.
Neuroinflammation - an early event in both the history and pathogenesis of Alzheimer's disease Neurodegener Dis. 2010;7(1-3):38–41. [PubMed]

3. Swardfager W, Lanctôt K, Rothenburg L, Wong A, Cappell J, Herrmann N. A meta analysis of cytokines in Alzheimer's disease. *Biol Psychiatry* 2010; 68: 93041
4. S G R Smalley, P A Barrow, N Foster Immunomodulation of innate immune responses by **vasoactive intestinal peptide** (VIP): its therapeutic potential in inflammatory disease
Clin Exp Immunol. 2009 August; 157(2): 225–234
5. [Shoemaker R, House D, Ryan J. Vasoactive intestinal polypeptide \(VIP\) corrects chronic inflammatory response syndrome \(CIRS\) acquired following exposure to water-damaged buildings. *Health* 2013; 3: 396-401.](#)
6. Min Song, Jia-xiang Xiong, Yan-yan Wang, Jun Tang, Bo Zhang, Yun Bai
[VIP Enhances Phagocytosis of Fibrillar Beta-Amyloid by **Microglia** and Attenuates Amyloid Deposition in the Brain of APP/PS1 Mice](#)
PLoS One. 2012; 7(2): e29790. Published online 2012 February 6
7. Therapeutic potential of vasoactive intestinal peptide and its receptors in neurological disorders [Dejda A¹, Sokołowska P, Nowak JZ](#) Neuroprotective potential of three neuropeptides PACAP, VIP and PHI. *Pharmacol Rep.* 2005 May-Jun;57(3):307-20.
8. Delgado M, Nieves V, Gonzalez-Rey E. Vasoactive intestinal peptide protects against β -amyloid-induced neurodegeneration by inhibiting microglia activation at multiple levels. *Glia.* 2008;56(10):1091–1103. [[PubMed](#)]

Some recent interesting research on VIP

Interesting article on VIP interneurons and cholinergic connections to Nucleus of Meynart:

Wall, N. R. *et al.* Brain-Wide Maps of Synaptic Input to Cortical Interneurons. *J. Neurosci.* **36**, 4000–9 (2016).

Usefulness of VIP in phase advancing circadian sleep mechanisms (i.e. could help with sleep)

Jones, J. R., Simon, T., Lones, L. & Herzog, E. D. SCN VIP neurons are essential for normal light-mediated resetting of the circadian system. *J. Neurosci.* 1322–18 (2018). doi:10.1523/JNEUROSCI.1322-18.2018

Antibacterial properties of VIP

Campos-Salinas, J. *et al.* Therapeutic Efficacy of Stable Analogues of Vasoactive Intestinal Peptide against Pathogens. *J. Biol. Chem.* **289**, 14583–14599 (2014).

VIP Interacts with Mast Cells to Regulate Intestinal Permeability

Bednarska, O. *et al.* Vasoactive Intestinal Polypeptide and Mast Cells Regulate Increased Passage of Colonic Bacteria in Patients With Irritable Bowel Syndrome. *Gastroenterology* **153**, 948–960.e3 (2017).