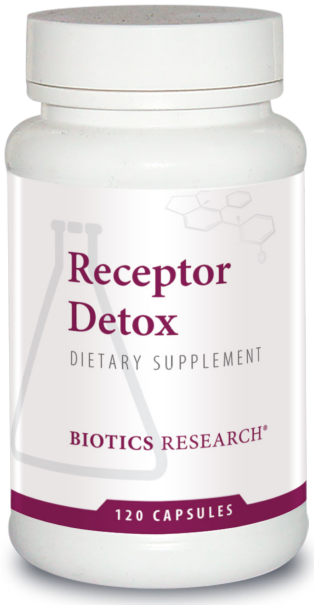
Receptor Detox

Support for Hormone Receptor Functionality to Help Foster Healthy Hormone Signaling



Receptor Detox contains carefully selected nutrients shown to gently, effectively and safely optimize hormone receptor function, ensuring healthy hormone signaling. Receptor dysfunction can be multifactorial; often a result of such things as systemic inflammatory responses, reactive oxygen species, endocrine disrupting compounds (EDCs), polymorphisms in receptor genes, signaling pathway anomalies, and altered gene expression.[1,2,3] Long-term exposure to any or all of these contributing factors is widely thought to play an important role in many chronic conditions by modulating both hormone actions and hormone receptor activity.[4,5,6] This product is recommended daily for optimal receptor functioning for both females and males, and highly recommended for mature people on hormone replacement.

Receptor Detox formulator, Dr. Devaki Lindsey Berkson, has worked as a hormone scholar at a Tulane University estrogen think-tank (Center for Bioenvironmental Research) with scientists who discovered the first two estrogen receptors, estrogen receptor alpha (ERα) and estrogen receptor beta (ERß). Dr. Berkson developed **Receptor Detox** to provide the most critical nutrients designed to help improve receptor functionality, restoring the tightly controlled regulation of endocrine activity disrupted by the modern environment. Her focus on receptor function and *not just hormone levels* is partly a result of many lectures delivered over years of E.Hormone conferences, which highlighted the role of receptor functionality in keeping hormone signals intact, and the role of receptor function in disease prevention.

Clinical Relevance

As the number of EDCs in production increase each year, so too does the number of conditions for which these environmental toxins are implicated, driving the pathophysiology, in part by blocking and/or mimicking hormones as well as disturbing hormone receptor function.

One mechanism is by competitive inhibition of hormone receptors, which displaces endogenous hormones and results in altered nuclear signaling.

Perfluorooctanoic acid (PFOA), for example, has been shown to compete with calcitriol for the vitamin D receptor, altering the receptor's structure and flexibility, and altering the response of vitamin D-responsive genes as well as osteoblastic function. Not only may this provide a mechanism for the inverse relationship between perfluorinated compounds and bone health, but serum levels of vitamin D among exposed men were not affected, while parathyroid levels were increased. This provides a solid demonstration of the ability of environmental toxins to impair receptor function, contribute to disease, while not altering the level of hormones (such as vitamin D) which would normally be used to assess risk.[7]

Having a daily receptor detox on board may be increasingly important, given the ubiquity of EDCs and their associated conditions. While insulin resistance is the most well-characterized example of receptor resistance, nearly every hormone (thyroxine, testosterone, progesterone, etc.) can be affected.[8,9,10] Adipose tissue is also an active endocrine organ, modulating appetite control, inflammation, insulin sensitivity, etc., and is also targeted by EDCs, likely contributing to both the obesity and diabetes epidemics.[11]

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Receptor Detox supplies key nutrients which:

1. Allow hormones to bind effectively and appropriately to their associated receptors.
2. Clear competitive inhibitors off receptors in a safe and continuous manner.
3. Optimize receptor functionality, allowing hormones to safely and effectively deliver their signals and overcome resistance

Highlights

Vitamin B3 (niacin & niacinamide)

Vitamin B3 is required for the synthesis of nicotinamide adenine dinucleotide (NAD), an essential co-factor for the enzymes which produce all active steroid hormones, known as 3β-hydroxysteroid dehydrogenase isozymes.[12] These enzymes synthesize glucocorticoids, mineralocorticoids, progesterone, androgens, and estrogens, and are found in a variety of tissues, including the adrenal glands, ovaries, and testes.[13]

Niacin also binds to the G-protein-coupled receptor HCAR2 (Hydroxycarboxylic acid receptor 2), expressed in microglia, adipocytes, macrophages, keratinocytes, etc., reducing inflammation in the gastrointestinal and nervous systems, enhancing synthesis of IgA in the intestine, and promoting cutaneous vasodilation (flushing).[14,15,16] The broad multi-system anti-inflammatory effects of niacin, mediated via modulation of G-protein coupled receptors, may help to explain the cardiovascular benefits previously attributed solely to a reduction in lipids.[17]

Vitamin B6

Vitamin B_6 is recognized to modify both the expression and the action of steroid hormone receptors, and to be essential for catecholamine synthesis, including neurotransmitters such as serotonin. Very recently it has been shown to upregulate glutathione production and Nrf2 transactivation, a pathway associated with cellular protection and defense.[18]

Also, the more rapid utilization of B_6 in the presence of excess estrogen or estrogen-like compounds increases nutritional needs.[19] A lack of the active form of B6 and other methyl donors may predispose for excessive estrogen activity, heightening the risk for estrogen-associated dysfunction.[20] **Receptor Detox** provides the active form of vitamin B_6, pyridoxal-5-phosphate, avoiding any biochemical bottlenecks which may limit its benefit.

Calcium-d-glucarate

Calcium-d-glucarate provides support for glucuronidation, a key type of phase 2 detoxification needed for many exogenous toxins as well as endogenous compounds, including bilirubin and steroid hormones.[21]

After modification by the intestinal microbiome, calcium-d-glucarate's metabolites inhibit the enzyme beta-glucuronidase, thereby preventing the deconjugation of glucuronic acid from these substrates, and improving their elimination. Enhancing glucuronidation modulates the cellular hormonal milieu by supporting the healthy detoxification of excess estrogen and other steroids.[22,23]

In addition to enhancing the removal of excess hormones, calcium-d-glucarate also provides support for the detoxification of many hormone-mimicking environmental toxins. For example, PCBs and phthalates, both established as endocrine disruptors, undergo phase 2 biotransformation via glucuronidation before being eliminated.[24,25] Indeed, genetic variants in glucuronidation enzymes in combination with exposure to endocrine disrupting chemicals have been associated with risk for hormone-sensitive conditions, such as polycystic ovary syndrome.[26]

Iodine

Iodine promotes detoxification, lymph flow and offers protection to the receptor. It helps lower to responsiveness of breast tissue to sex steroids due to its antioxidant and antiproliferative effects, contributing to the integrity of normal mammary glands.[27,28,29] Iodine exhibits antiproliferative and apoptotic effects in various cancer cells including the breast. In animal and human studies, molecular iodine (I_2) supplementation limits excessive cell growth.[30] Specifically, I_2 supplementation enhances the formation of 6-iodolactone (6-IL), a potent promoter of peroxisome proliferator-activated receptor gamma (PPARγ) expression, partly responsible for an induction of apoptosis and inhibition of several estrogen-responsive genes.[31] Iodine also plays a role in estrogen metabolism.

In addition, sufficient iodine avoids and protects the build-up of endocrine-disrupting "halides," which are competitive inhibitors of iodine found in bakery products, flame retardants, pesticides, insecticides and our water supply.[32]

Cilantro

Cilantro helps to remove EDCs out of endocrine tissues. A natural chelating agent against heavy metals, cilantro helps move toxic substances through the kidneys and out of the body.[33,34,35,36] *In vitro* studies also suggest it has antioxidant and antiproliferative effects.[37,38]

Parsley

Parsley contains unique flavonoids with antioxidant and anti-inflammatory properties. Apigenin, the bioactive flavone found in parsley, has been shown to act as a powerful antioxidant and enhance TRAIL-mediated apoptosis in irregular cells.[39] It also appears to have direct effects on the estrogen receptor, with *in vitro* data demonstrating an inhibition of cervical growth by inhibiting an estrogen receptor mediated pathway.[40]

Together with chlorella and dandelion, parsley works to promote healthy detoxification and elimination of endogenous and exogenous compounds.

Zinc

Zinc is an essential nutrient in all sex steroid binding domains. It is required by zinc finger protein domains, and a deficiency has been shown to increase the oxidative stress and alter the architecture of mammary tissues, creating a toxic microenvironment in animal studies.[41,42,43,44]

Magnesium

Magnesium glycinate, along with zinc citrate, pyridoxal-5-phosphate, selenium and milk thistle, all promote hepatic detoxification of hormones and elimination of toxins that block receptor functionality.

Magnesium also helps regulate sex hormone binding globulin (SHBG), improving testosterone signaling.[45,46]

Milk Thistle

Primarily recognized for its hepatoprotective and antioxidant properties, milk thistle contains flavonoids, which limit excessive cellular reproduction through multiple mechanisms in both *in vitro* and *in vivo* models, including modulation of the ERα receptor and suppression of TGF-β2 production.[47,48,49,50] Recently, milk thistle has also been found to selectively bind the ERβ receptor, providing additional protection to estrogen sensitive tissues.[51,52]

Summary & Recommendations

Receptor Detox supports healthy hormonal and neurotransmitter signaling, and mineral displacement of EDCs and heavy metals, allowing for optimal receptor functionality. Key minerals and botanicals improve receptor function and enhance the detoxification and elimination of the environmental pollutants which have become commonplace, competing with endogenous hormone activity.

Dietary Support

In addition to **Receptor Detox** supplementation, consuming Brassica vegetables daily helps to:

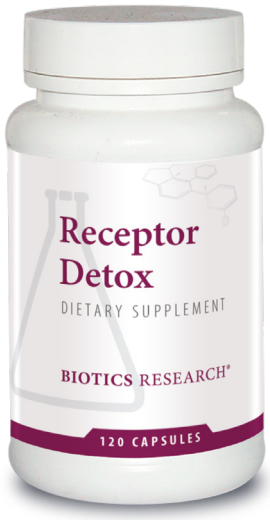
- Detoxify carcinogens
- Keep estrogens safe
- Promote balance between ERα and ERß
- Inhibit growth and activity of tumors
- Activate antioxidants
- Support healthy inflammation, including the resolution of inflammation

Recommended Use: Two capsules two times per day with food as a dietary supplement or as otherwise directed by a healthcare professional.

Additional dosing suggestions

For a deeper detox, take four capsules twice a day. Also, before initiating hormonal therapies, it is recommended to take four capsules twice a day for a week and then continue with two capsules twice a day while taking hormones.

Caution: Not recommended for children, pregnant or lactating women.



Receptor Detox is available in a 120 capsule bottle (#6271).

Supplement Facts

Serving Size: 2 Capsules
Servings Per Container: 60

	Amount Per Serving	% Daily Value
Niacin (as niacin and niacinamide)	40 mg	250%
Vitamin B6 (as pyridoxal-5-phosphate)	10 mg	588%
Iodine (as potassium iodide)	2 mg	1,333%
Magnesium (as magnesium glycinate)	5 mg	<2%
Zinc (as zinc citrate)	10 mg	91%
Selenium (as vegetable culture†)	50 mcg	91%
Calcium d-glucarate	100 mg	*
Proprietary Blend	710 mg	
Cilantro (Coriandrum sativum)(seed)(extract)*, Dandelion (Taraxacum officinale)(root)(extract)*, Parsley (Petroselinum crispum)(leaf)(extract)*, Chlorella (cracked cell wall)*, Milk thistle (Silybum marianum)(root & aerial part)(extract)*		

***Daily Value not established**

Other ingredients: Capsule shell (gelatin and water) and stearic acid (vegetable source).

† Specially grown, biologically active vegetable culture (from organic peas, lentils and/or chickpeas) containing **Phytochemically Bound Selenium™** and other phytochemicals including polyphenolic compounds with SOD and catalase, dehydrated at low temperature to preserve associated enzyme factors.

This product is gluten and dairy free.

RECOMMENDATION: Two (2) capsules, two (2) times per day with food as a dietary supplement or as otherwise directed by a healthcare professional.

CAUTION: Not recommended for children, pregnant or lactating women.

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