# Hormone Balance & Protect

## Protects and Helps Maintain Balance, Bioavailability and Safety of Naturally Produced Hormones as well as Hormonal Therapies


**Hormone Balance & Protect** is a nutritional and herbal formula critical to supporting healthy and safe metabolism of endogenous hormones as well as hormonal therapies. Optimal endocrine function requires both sufficient hormone production and availability, as well as highly functioning hormone receptors. Widespread exposure to endocrine disrupting compounds (EDCs) interferes with many hormone-dependent processes in what should be a closely controlled communications system, partly by competing at hormone and nuclear receptors, and mimicking or suppressing endogenous hormone activity.[1] This formula provides key nutrients and botanicals to help stabilize hormone levels and enhance their binding, restoring balance to hormonal signaling pathways.

**Hormone Balance & Protect** 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). 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

Exposure to EDCs has become nearly universal, with many of their detrimental consequences mediated via hormonal interference. Although EDCs have diverse mechanisms of toxicity, they are known to interfere with the synthesis, action, and metabolism of sex steroid hormones, including direct interference at the steroid hormone receptor, such as the estrogen and androgen receptors.[2] Phthalates, for example, interrupt testosterone synthesis in Leydig cells and may also modulate conversion to the more potent androgen dihydrotestosterone.[3]

Dioxins and certain organochlorine pesticides induce the activity of cytochrome P450 enzymes which metabolize estrogen more rapidly, decreasing the amount of estrogen available for binding.[4]

### Hormone Balance & Protect Benefits:

- Protects and helps maintain balance, bioavailability and safety of naturally produced hormones as well as prescribed hormonal therapies.
- Promotes hormone balance by enhancing bioavailability of hormone action on diverse cells.
- Supports overall balanced and hormonal health including receptor functionality, optimal duration of signaling time and nutrient support for transcriptional co-factors to get critical hormone signals into cell's genes.

BIOTICS® RESEARCH CORPORATION

(800) 373-1373
Metabolic Management
P.O. Box 715 • Grant Park, IL 60940
www.metabolicmanagement.com


LIT-341 Rev. 10/23

## Highlights

### Para-Aminobenzoic Acid

Para-aminobenzoic acid (PABA) is an intermediary in the bacterial synthesis of folic acid. PABA likely potentiates the action of both glucocorticoids and estrogens. In the early 1950's when cortisone was very expensive, it was discovered that adding PABA to cortisone slowed the breakdown of cortisone in the liver, allowing the patient to get more benefit with less medication and cost.[5,6,7,8]

As a hormone potentiator, PABA was discovered to potentiate the action of glucocorticoids and estrogens. It does so by slowing down the metabolism of these hormones, and many other sex steroid hormones such as androgens, increasing their half-lives. The patient gets a more "level" hormone experience.[9,10] By slowing down the metabolism of the hormones in the liver and uterus, the hormones can act longer.[11,12]

In an uncontrolled trial, administration of 100 mg of PABA 4 times a day per day for 3 to 7 months to 16 women who had been infertile for at least 5 years resulted in pregnancy in 12 cases (75%).[13]

PABA also supports a balanced and healthy immune system by boosting the natural production of interferon.[14] It may also have an anti-clotting effect, inhibiting thrombin induced thromboxane B2 in human platelets, suggesting a potential benefit when taken with estrogen.[15,16] PABA is a natural and effective anti-inflammatory agent, a powerful antioxidant and a lipid peroxidase inhibitor, even in the eyes.[7,9,17,18,19]

PABA appears to have antifibrotic actions. As humans age, fibrosis can drive adverse modeling of tissues in the heart, kidneys and brain. As a result, PABA promotes healthier aging of heart, brain and renal tissues. It also appears to increase the use of oxygen especially by the skin.[20,21]

PABA works as a thyroid protector and appears to decrease TPO antibody levels to some extent, although additional research is needed. But it is not contraindicated in autoimmune thyroiditis.[22]

### Vitamin A

Retinol and other vitamin A derivatives are ligands for many nuclear receptors, such as retinoic acid receptor-retinoid X receptors, influencing expression of a variety of genes, with virtually every organ dependent on vitamin A availability.[23]

Vitamin A is also an unappreciated co-factor for 3 beta-dehydrogenase, also critical for steroidogenesis.

Deficiencies of this vitamin may result in impaired enzyme activity and impaired activity of estrogen, as well as other sex steroid hormones. For example, among women with menorrhagia and hypovitaminosis A, estradiol levels normalized (as did menstrual flow) in more than 92% of patients.[24,25,26,27,28,29]

### Boron

Boron helps improve the bioavailability of estrogen, testosterone and vitamin D.[30] Boron helps release estrogen and testosterone from their binding protein SHGB, increasing the free levels of these steroids, and the bioavailability of hormones or hormone therapies.[31,32] Additionally, many heavy metals work act as hormone receptor antagonists, but boron protects against heavy metal and EDC toxicity.

### Benefits of Boron[33]:

- Supports growth and maintenance of bone
- Helps with wound healing
- Beneficially impacts the body's use of estrogen, testosterone, and vitamin D
- Boosts magnesium absorption
- Balances levels of inflammatory biomarkers, such as high-sensitivity C-reactive protein (hs-CRP) and tumor necrosis factor α (TNF-α)
- Raises levels of antioxidant enzymes, such as superoxide dismutase (SOD), catalase, and glutathione peroxidase
- Protects against pesticide-induced oxidative stress and heavy-metal toxicity
- Supports the brain's electrical activity, cognitive performance, and short-term memory for elders
- Influences the formation and activity of key biomolecules, such as S-adenosyl methionine (SAM-e) and nicotinamide adenine dinucleotide (NAD(+))
- Promotes healthy parathyroid action[34]
- Promotes healthy action of estrogen on the basic cells of the heart[34]

### Grape Seed Extract

Grape seed extract is a natural aromatase inhibitor, suppressing aromatase gene expression as well as aromatase activity.

Grape seed extract (GSE) contains high levels of procyanidin dimers shown to be potent inhibitors of aromatase, and it also favorably modulates the ERβ gene.[35,36]

Animal studies suggest it may also block the action of bisphenol A, at least partly through an antioxidant effect.[37]

### Vitamin B6

Vitamin B6 modulates steroid receptor-mediated gene expression, either increasing or decreasing gene expression depending upon the availability of vitamin B6 within the cell.[38] Along with other B vitamins, higher intake has been associated with more favorable risk for conditions related to estrogen activity, at least in part by its role in one-carbon metabolism.[39] Perhaps by modulating cortisol activity, supplementation has been associated with reduced pre-menstrual anxiety as well as anxiety among older women.[40]

### Zinc

In addition to its role zinc-finger proteins, which play a key role in hormone receptor binding, zinc has been shown to be crucial to the reproductive system of both men and women. While in men it has clearly been shown to be essential to spermatogenesis, maintenance of testosterone levels and sexual development, in women a zinc deficiency has been linked to multiple pathologies, including decreased FSH and LH synthesis, and other hormonal imbalances.[41,42]

### 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.[43,44,45,46] Recently, milk thistle has also been found to selectively bind the ERβ receptor, providing additional protection to estrogen sensitive tissues.[47,48]

### Broccoli Seed Extract

Cruciferous vegetables have long been recognized to have favorable benefits on estrogen metabolism, shifting detoxification pathways toward less toxic metabolites, and disruption of ERα transcription.[49,50] Glucosinolates have also been shown to induce expression of the antioxidant enzyme NAD(P)H:quinone oxidoreductase (NQO1), which provides additional protection against environmental toxicants.[51,52]

## How to Use

**Recommendation:** Two capsules two times per day with food as a dietary supplement.

**Caution:** Consult your healthcare practitioner before taking this product if you are pregnant or lactating. Due to this product containing PABA, it is not recommended for patients with severe sulfa hypersensitivities or those taking sulfa medications.


**Hormone Balance & Protect** are available in 120 capsule bottles (#8130).

## Supplement Facts

**Serving Size: 2 Capsules**
**Servings Per Container: 60**

| | Amount Per Serving | % Daily Value |
|---|---|---|
| Vitamin A (retinyl acetate) | 900 mcg RAE (3,000 IU) | 100% |
| Vitamin C (as ascorbic acid) | 125 mg | 139% |
| Niacin (as niacin) | 10 mg | 63% |
| Vitamin B6 (as pyridoxine HCl) | 5 mg | 294% |
| Vitamin B5 (as calcium pantothenate) | 100 mg | 2,000% |
| Iodine (as potassium iodide) | 1.5 mg | 1,000% |
| Magnesium (as magnesium glycinate) | 10 mg | 2% |
| Zinc (as zinc citrate) | 15 mg | 136% |
| Copper (as copper citrate) | 0.25 mg | 28% |
| PABA (para-aminobenzoic acid) | 150 mg | * |
| Broccoli (seed)(extract)(10% Glucoraphanin) | 100 mg | * |
| Grape Seed Extract (95% OPC's) | 70 mg | * |
| Boron (as calcium borogluconate) | 3 mg | * |
| Proprietary Blend<br>Ginseng (Panax ginseng)(root)*, Citrus bioflavonoids*, Stinging Nettle (Urtica dioica)(root)(extract)*, Milk thistle (Silybum marianum)(root & aerial part)(extract)* | 335 mg | |

***Daily Value not established**

**Other ingredients:** Capsule shell (gelatin and water) and magnesium stearate (vegetable source).

**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 pregnant or lactating women.

**KEEP OUT OF REACH OF CHILDREN**
Store in a cool, dry area.
Sealed with an imprinted safety seal for your protection.

*These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure, or prevent any disease.

**References**


1. Küblbeck J, Niskanen J, Honkakoski P. Metabolism-Disrupting Chemicals and the Constitutive Androstane Receptor CAR. Cells. 2020 Oct 15;9(10):2306. PMID: 33076503
2. Yilmaz B, Terekeci H, Sandal S, Kelestimur F. Endocrine disrupting chemicals: exposure, effects on human health, mechanism of action, models for testing and strategies for prevention. Rev Endocr Metab Disord. 2020 Mar;21(1):127-147. PMID: 31792807.
3. Foster PM. Mode of action: impaired fetal leydig cell function--effects on male reproductive development produced by certain phthalate esters. Crit Rev Toxicol. 2005 Oct-Nov;35(8-9):713-9. PMID: 16417038.
4. Gore AC, Chappell VA, Fenton SE, et al. EDC-2: The Endocrine Society's Second Scientific Statement on Endocrine-Disrupting Chemicals. Endocr Rev. 2015 Dec;36(6):E1-E150. PMID: 26544531
5. BORIONI D, SCASSELLATI-SFORZOLINI G. Ricerche sperimentali sull'azione dell'acido paraminobenzoico, dell'istidina e del cortisone sui processi di attecchimento dei trapianti corneali [Experimental study on the affect of paraaminobenzoic acid, and histadine, and cortisone in keratoplasty]. Boll Ocul. 1952 Oct;31(10):623-31. PMID: 12997601.
6. BONNER CD, FISHMAN WH, HOMBURGER F. [Therapeutic studies with ACTH and cortisone. II. Cortisone combined with potassium para aminobenzoate and glucuronolactone in the treatment of rheumatoid arthritis and pemphigus; a preliminary report]. Geriatrics. 1953 Aug;8(8):446-51. PMID: 13068596.
7. WIESEL LL, BARRITT AS. Long term treatment of rheumatoid arthritis with para-aminobenzoic acid and cortisone acetate. Am J Med Sci. 1954 Jan;227(1):74-9. PMID: 13114217.
8. KALLIOMAKI L. Therapy of rheumatic fever; comparison of results obtained with salicylates, cortisone or corticotrophin, phenylbutazone, and combination of sodium salicylate, para-aminobenzoic acid and cortisone. Acta Med Scand. 1955 Dec 7;152(6):473-8. PMID: 13292167.
9. WIESEL LL. Effect of para-aminobenzoic acid on the metabolism of cortisone in liver tissue. Am J Med Sci. 1954 Jan;227(1):80-2. PMID: 13114218.
10. Anonymous. PABA and cortisone. Lancet 1951:2;674.
11. Garnovskaia MN, Tret'iakov AV, et al. Proizvodnye aminobenzoĭnoĭ kisloty kak spetsificheskie ingibitory fosfodiésterazy tsiklicheskikh nukleotidov matki krys [Aminobenzoic acid derivatives as specific inhibitors of cyclic nucleotide phosphodiesterase in the rat uterus]. Ukr Biokhim Zh (1978). 1990 Jan-Feb;62(1):97-101. Russian. PMID: 2159667.
12. Nutritional Medicine, Second Edition. Gaby A. Alan Perlberg Publishing Concord, NH. 2017;p 248.
13. Sieve BF. The clinical effects of a new B complex factor, para-aminobenzoic acid, on pigmentation and fertility. South Med Surg 1942(March);104:135–139.
14. Akberova SI, Tazulakhova EB, Musaev-Galbinur PI, et al. Paraaminobenzoĭnaia kislota--induktor interferona [Para-aminobenzoic acid--an interferon inducer]. Antibiot Khimioter. 1999;44(4):17-20. Russian. PMID: 10483491.
15. Drozd NN, Makarov VA, Miftakhova NT, et al. Antitromboticheskaia aktivnost' paraaminobenzoĭnoĭ kisloty [Antithrombotic activity of para-aminobenzoic acid]. Eksp Klin Farmakol. 2000 May-Jun;63(3):40-4. Russian. PMID: 10934595.
16. Barbieri B, Papadogiannakis N, Eneroth P, et al. p-Aminobenzoic acid, but not its metabolite p-acetamidobenzoic acid, inhibits thrombin induced thromboxane formation in human platelets in a non NSAID like manner. Thromb Res. 1997 Apr 15;86(2):127-40. PMID: 9175234.
17. b1berova SI, Musaev PI, Magomedov NM, et al. Paraaminobenzoĭnaia kislota kak antioksidant [Para-aminobenzoic acid as an antioxidant]. Dokl Akad Nauk. 1998 Jul;361(3):419-21. Russian. PMID: 9785016.
18. WIESEL LL, BARRITT AS, STUMPE WM. The synergistic action of paraaminobenzoic acid and cortisone in the treatment of rheumatoid arthritis. Am J Med Sci. 1951 Sep;222(3):243-8. PMID: 14877810.
19. Akberova SI, Musaev Galbinur PI, Magomedov NM, Babaev KhF, Gakhramanov KhM, Stroeva OG. Sravnitel'naia otsenka antioksidantnoĭ aktivnosti paraaminobenzoĭnoĭ kisloty i émoksipina v setchatke [Comparative assessment of antioxidant activity of para-aminobenzoic acid and emoxipin in retina]. Vestn Oftalmol. 1998 Nov-Dec;114(6):39-44. Russian. PMID: 9951387.
20. Zarafonetis cj. Antifibrotic therapy with potaba. Am J Med Sci. 1964 Nov;248:550-61. PMID: 14224774.
21. Nutritional Medicine, Second Edition Gaby Alan R. Perlberg Press 2017 ps: 612, 701, 846, 644.
22. Nutritional Medicine, Second Edition Gaby Alan R. Perlberg Publications 2017 p: 1194.
23. Jones BG, Penkert RR, Surman SL, et al. Nuclear Receptors, Ligands and the Mammalian B Cell. Int J Mol Sci. 2020 Jul 15;21(14):4997. doi: 10.3390/ijms21144997. PMID: 32679815
24. Manna PR, Slominski AT, King SR, et al. Synergistic activation of steroidogenic acute regulatory protein expression and steroid biosynthesis by retinoids: involvement of cAMP/PKA signaling. Endocrinology. 2014 Feb;155(2):576-91. PMID: 24265455
25. Lithgow DM, Politzer WM. Vitamin A in the treatment of menorrhagia. S Afr Med J. 1977 Feb 12;51(7):191-3. PMID: 847567.
26. Anonymous. Vitamin A in the treatment of menorrhagia. S Afr Med J. 1977 May 14;51(20):694-5. PMID: 877781.
27. Brabin L, Brabin BJ. The cost of successful adolescent growth and development in girls in relation to iron and vitamin A status. Am J Clin Nutr. 1992 May;55(5):955-8. PMID: 1570803.
28. Cohen BJ, Gibor Y. Anemia and menstrual blood loss. Obstet Gynecol Surv. 1980 Oct;35(10):597-618. PMID: 6997784.
29. BOSOLD J. Spielt Vitamin-A-Mangel eine Rolle bei Fluor vaginalis und bei klimakterischen Blutungen? [Etiology of vitamin A deficiency in vaginal fluor and in climacteric bleeding]. Hippokrates. 1952 May 15;23(9):251-2. Undetermined Language. PMID: 12989816.
30. Rondanelli M, Faliva MA, Peroni G, et al. Pivotal role of boron supplementation on bone health: A narrative review. J Trace Elem Med Biol. 2020 Dec;62:126577. PMID: 32540741.
31. Bello M, Guadarrama-García C, Velasco-Silveyra LM, et al. Several effects of boron are induced by uncoupling steroid hormones from their transporters in blood. Med Hypotheses. 2018 Sep;118:78-83. PMID: 30037620.
32. Naghii MR, Mofid M, Asgari AR, et al. Comparative effects of daily and weekly boron supplementation on plasma steroid hormones and proinflammatory cytokines. J Trace Elem Med Biol. 2011 Jan;25(1):54-8. PMID: 21129941.
33. Pizzorno L. Nothing Boring About Boron. Integr Med (Encinitas). 2015 Aug;14(4):35-48. PMID: 26770156
34. Korolev IuN, Panova LN, Geniatulina MS. Vliianie bora na ul'trastrukturu paratirotsitov i predserdnykh kardiomiotsitov [Effect of boron on the ultrastructure of parathyrocytes and atrial cardiomyocytes]. Biull Eksp Biol Med. 1997 Jul;124(7):111-4. Russian. PMID: 9303718.
35. Kijima I, Phung S, Hur G, et al. Grape seed extract is an aromatase inhibitor and a suppressor of aromatase expression. Cancer Res. 2006 Jun 1;66(11):5960-7. PMID: 16740737.
36. Abroodi Z, Sajedi N, Nikbakht M, et al. Estrogen Receptor Beta (ERβ) May Act as Mediator in Apoptotic Induction of Grape Seed Extract (GSE). Asian Pac J Cancer Prev. 2019 Dec 1;20(12):3729-3734. PMID: 31870115
37. Rameshrad M, Razavi BM, Imenshahidi M, et al. Vitis vinifera (grape) seed extract and resveratrol alleviate bisphenol-A-induced metabolic syndrome: Biochemical and molecular evidences. Phytother Res. 2019 Mar;33(3):832-844. Jan 17. PMID: 30653759.
38. Tully DB, Allgood VE, Cidlowski JA. Modulation of steroid receptor-mediated gene expression by vitamin B6. FASEB J. 1994 Mar 1;8(3):343-9. PMID: 8143940.
39. M, Ameri F, Eini-Zeinab H, Jamshidi-Naeini Y, et al. The Vitamins Involved in One-Carbon Metabolisms are Associated with Reduced Risk of Breast Cancer in Overall and Subtypes. Int J Vitam Nutr Res. 2020 Jan;90(1-2):131-140. PMID: 30758268.
40. McCabe D, Lisy K, Lockwood C, Colbeck M. The impact of essential fatty acid, B vitamins, vitamin C, magnesium and zinc supplementation on stress levels in women: a systematic review. JBI Database System Rev Implement Rep. 2017 Feb;15(2):402-453. PMID: 28178022.
41. Zhao D, Ma G, Zhang X, et al. Zinc Finger Homeodomain Factor Zfhx3 Is Essential for Mammary Lactogenic Differentiation by Maintaining Prolactin Signaling Activity. J Biol Chem. 2016 Jun 10;291(24):12809-12820. PMID: 27129249
42. Nasiadek M, Stragierowicz J, Klimczak M, et al. The Role of Zinc in Selected Female Reproductive System Disorders. Nutrients. 2020 Aug 16;12(8):2464. PMID: 32824334
43. Cheung CW, Gibbons N, Johnson DW, et al. Silibinin--a promising new treatment for cancer. Anticancer Agents Med Chem. 2010 Mar;10(3):186-95. PMID: 20015009.
44. Binienda A, Ziolkowska S, Pluciennik E. The Anticancer Properties of Silibinin: Its Molecular Mechanism and Therapeutic Effect in Breast Cancer. Anticancer Agents Med Chem. 2020;20(15):1787-1796. PMID: 31858905.
45. Principi M, Di Leo A, Pricci M, et al. Phytoestrogens/insoluble fibers and colonic estrogen receptor β: randomized, double-blind, placebo-controlled study. World J Gastroenterol. 2013 Jul 21;19(27):4325-33. PMID: 23885143
46. Zheng N, Liu L, Liu WW, et al. Crosstalk of ROS/RNS and autophagy in silibinin-induced apoptosis of MCF-7 human breast cancer cells in vitro. Acta Pharmacol Sin. 2017 Feb;38(2):277-289. PMID: 27867187
47. Liu W, Ji Y, Sun Y, Si L, et al. Estrogen receptors participate in silibinin-caused nuclear translocation of apoptosis-inducing factor in human breast cancer MCF-7 cells. Arch Biochem Biophys. 2020 Aug 15;689:108458. PMID: 32524997
48. Dupuis ML, Conti F, Maselli A, et al. The Natural Agonist of Estrogen Receptor β Silibinin Plays an Immunosuppressive Role Representing a Potential Therapeutic Tool in Rheumatoid Arthritis. Front Immunol. 2018 Aug 17;9:1903. PMID: 30174672
49. Farvid MS, Chen WY, Rosner BA, et al. Fruit and vegetable consumption and breast cancer incidence: Repeated measures over 30 years of follow-up. Int J Cancer. 2019 Apr 1;144(7):1496-1510. PMID: 29978479
50. Marconett CN, Singhal AK, Sundar SN, Firestone GL. Indole-3-carbinol disrupts estrogen receptor-alpha dependent expression of insulin-like growth factor-1 receptor and insulin receptor substrate-1 and proliferation of human breast cancer cells. Mol Cell Endocrinol. 2012 Nov 5;363(1-2):74-84. PMID: 22835548;
51. Cornblatt BS, Ye L, Dinkova-Kostova AT, et al. Preclinical and clinical evaluation of sulforaphane for chemoprevention in the breast. Carcinogenesis. 2007 Jul;28(7):1485-90PMID: 17347138.
52. Fahey JW, Zhang Y, Talalay P. Broccoli sprouts: an exceptionally rich source of inducers of enzymes that protect against chemical carcinogens. Proc Natl Acad Sci U S A. 1997 Sep 16;94(19):10367-72. doi: 10.1073/pnas.94.19.10367. PMID: 9294217;



BIOTICS® RESEARCH CORPORATION

**(800) 373-1373**

Metabolic Management
P.O. Box 715 • Grant Park, IL 60940
www.metabolicmanagement.com




LIT-341 Rev. 10/23