



## Indole-3-Carbinol

Stock #1506-4 (60 capsules)

Indole-3-carbinol is a compound found in high concentrations in vegetables such as broccoli, Brussels sprouts, cabbage, cauliflower and kale. Increasing preclinical and clinical evidence indicates that indole-3-carbinol has multiple anticarcinogenic and anti-tumor properties. In recent years, indole-3-carbinol has gained attention as a promising agent for both prevention and treatment of breast and cervical cancers. In addition, preliminary in vitro studies suggest that indole-3-carbinol may be an effective therapeutic agent for the prevention and treatment of prostate cancer.<sup>1-12</sup>

Indole-3-carbinol has a number of mechanisms by which it works to prevent cancer, including anti-estrogenic activity, the promotion of apoptosis (cell death), antioxidant activity (protection against free radical damage), and the induction of phase I and phase II detoxification enzymes, which chemically transform toxic compounds into excretable substances. Through its action on phase I and phase II enzymes, indole-3-carbinol alters estrogen metabolism (i.e. eliminates excess estrogen) in a manner that reduces the risk of certain tumors.<sup>4,7-9,11,13-16</sup>

Although estrogens are necessary for bone maintenance and female sexual development in the body, research has shown that elevated levels of circulating estrogens are associated with an increased risk for breast cancer. As a result, the body metabolizes (breaks down) excess estrogens into less potent compounds (metabolites): the "highly estrogenic" 16-alpha-hydroxyestrone and the "low estrogenic" 2-hydroxyestrone. Estrogen metabolism that increases production of 16-alpha-hydroxyestrone has been linked to an increase in breast cancer, whereas production of 2-hydroxyestrone appears to be protective against breast cancer. Studies have confirmed that the urinary ratio of 2-hydroxyestrone to 16-alpha-hydroxyestrone (expressed as 2:16-hydroxyestrone) is significantly lower in women with breast cancer when compared to healthy controls among both premenopausal and postmenopausal women. Thus, increasing the production of 2-hydroxyestrone, which would increase the 2:16 ratio of estrogen metabolites, would appear to be a potential protective measure against breast cancer.<sup>2,7,11,13,16-24</sup>

Several clinical trials have demonstrated indole-3-carbinol's ability to promote healthy estrogen metabolism, thus reducing the risk factor for breast cancer. Specifically, indole-3-carbinol has been shown to increase the ratio of 2:16-hydroxyestrone. In one study, 20 premenopausal women at high risk for breast cancer were given 400mg of indole-3-carbinol daily for 3 months. Compared to women receiving either a fiber supplement or placebo, those taking indole-3-carbinol demonstrated a statistically significant increase in urinary 2:16-hydroxyestrone ratios. Likewise, in a 2005 study involving 17 women at high risk for breast cancer, a maximum increase in urinary 2:16-hydroxyestrone ratio was achieved with a daily dose of 400mg of indole-3-carbinol.<sup>1,2,11,13,16,25</sup>

The ratio of urinary estrogen metabolites may also be a predictor for the risk of cervical cancer, the second-most common cancer among young women and one of the most common causes of cancer deaths in women, particularly among minorities and in impoverished countries. Studies have shown that women with grade II and III cervical intraepithelial neoplasia (CIN)—abnormal growth of precancerous cells in the cervix, also known as cervical dysplasia—have lower urinary 2:16-hydroxyestrone ratios than women with no abnormal cervical conditions. Initial studies using indole-3-carbinol have yielded promising results, including the regression and complete disappearance of advanced cervical dysplasia. Results of a preliminary double-blind, placebo-controlled study of women with CIN II/III showed that there was a statistically significant regression of CIN in those treated with indole-3-carbinol orally, compared to those receiving the placebo. Nearly 50% of the women taking indole-3-carbinol (400mg daily) demonstrated complete regression of the disease, while none in the placebo group experienced complete regression.<sup>2,3,11,24,25</sup>

In addition, indole-3-carbinol shows promise as an anticancer agent for prostate cancer. Several laboratory studies have shown that indole-3-carbinol inhibits the growth of human prostate cancer cells and prevents the progression of tumors by inducing apoptosis.<sup>8-12,27</sup>

Indole-3-carbinol has been well tolerated by individuals at dosages between 400 and 800mg daily, with the typical dosage ranging from 200 to 400mg per day.<sup>11</sup>

### References:

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