

Appendix A. CAM Substances with Evidence of Hormonal Activity

COMMON NAME	LATIN NAME	COMMON USES	HORMONAL ACTIVITY
Black cohosh	<i>Cimicifuga racemosa</i>	Menopausal symptoms	<p>Estrogen-like effects exerted by an unknown mechanism ¹⁻³</p> <p>Animal studies suggest it might suppress pituitary secretion of luteinizing hormone (LH)⁴</p> <p>Might also act as a partial agonist at serotonin receptors including 5HT-1A, 5HT-1D, and 5HT-7 receptors⁵ which may play a role in reducing menopausal symptoms</p>
Curcumin	<i>Curcuma longa</i>	Dyspepsia, musculoskeletal pain and inflammation	When used orally in medicinal amounts; turmeric might stimulate menstrual flow and the uterus ⁶
DHEA	<i>Dehydro-epiandrosterone</i>	Fatigue, cognitive impairment	<p>In low-estrogen environment has estrogenic effects similar to HRT including increasing estradiol, estrone, osteocalcin, growth hormone, and insulin-like growth factor 1 (IGF-1); also increases androstenedione and testosterone ^{7,8}</p> <p>DHEA-S stimulates the growth of estrogen receptor-positive breast cancer cells. It can overcome the estrogen receptor blocking activity of drugs such as tamoxifen (Nolvadex) and fulvestrant (Faslodex). Some researchers think controlling DHEA-S serum levels may be useful in the treatment of breast cancer⁹</p>

Dong quai	<i>Angelica sinensis</i>	Dysmenorrhea, menopausal symptoms	<p>Research suggests estrogenic effects^{10, 11} 12 13</p> <p>Competitively inhibits estradiol binding to estrogen receptors and induces transcription activity in estrogen-responsive cells¹⁰</p> <p>Ferulic acid stimulates proliferation of estrogen-receptor positive breast cancer cells in vitro. It also appears to up-regulate transcription of HER2 oncogene and ESR1 gene¹⁴</p> <p>Stimulates proliferation of both estrogen-receptor positive and negative breast cancer cells in vitro. The effect on estrogen-receptor positive cells appears to involve estrogen agonist activity. The effect on estrogen-receptor negative cells is independent of estrogen¹³</p>
Evening primrose oil	<i>Oenothera biennis</i>	Dysmenorrhea, menopausal symptoms, dermatologic conditions, inflammatory conditions	Some research suggests it may stimulate the growth of breast cancer cells at low concentrations and inhibit growth at higher concentrations ¹⁵
Flax seed	<i>Linum usitatissimum</i>	Constipation, IBS	Lignan constituent is phytoestrogen with weak estrogenic effects. Lignans share some structural similarities with endogenous estrogens; each has a diphenolic ring structure ¹⁶
Garlic	<i>Allium sativum</i>	Hyperlipidemia, CAD, HTN, anti-fungal	Reported to have abortifacient activity ¹⁷
Ginger	<i>Zingiber officinale</i>	Dyspepsia, flatulence, nausea	Inhibits thromboxane synthetase which could affect testosterone receptor binding in the fetus and theoretically affect sex steroid differentiation of the fetal brain ¹⁸
Gingko	<i>Gingko biloba</i>	Cognitive impairment, circulatory disorders	<p>May have labor-inducing and hormonal effects¹⁹</p> <p>May inhibit oocyte fertilization^{20, 21}</p>

Ginseng	<i>Panax ginseng</i> <i>Panax quinquefolius</i>	Improving resistance to stress, immune stimulant	<p>Appears to have estrogenic activity. An American ginseng extract decreases LH (luteinizing hormone) levels and increases serum ceruloplasmin oxidase activity (a measure of estrogenic activity in the liver) in an animal model¹⁰</p> <p>American ginseng may have estrogenic action, which might increase the growth of breast cancer cells^{11 22, 23}</p> <p>The ginsenoside constituents thought to be responsible for the estrogenic activity²³ an extracts that contain no ginsenosides or contain only a low concentration of ginsenosides do not appear to have estrogenic activity²²</p>
Grape seed/juice	<i>Vitis vinifera</i>	PAD, CVD	<p>Resveratrol constituent is a weak phytoestrogen^{24, 25}</p> <p>Trans-resveratrol has mixed agonist and antagonist activity on the estrogen-alpha receptor, whereas cis-resveratrol has significantly less activity at the estrogen receptor²⁶</p>
Grapefruit	<i>Citrus paradise</i>	Anti-microbial, hyperlipidemia	<p>Estrogen receptor agonist, can decrease the metabolism of estrogen in postmenopausal women, and has been associated with an increased risk of breast cancer of about 25% to 30% in women who consume over a quart of juice a day²⁷</p> <p>Thought to reduce estrogen metabolism resulting in increased endogenous estrogen levels and shown to increase exogenously administered 17-beta-estradiol by about 20% in women without ovaries and ethinyl-estradiol in healthy women^{28 29}</p>
Green Tea	<i>Camilla sinensis</i>	Cancer prevention, HPV, hyperlipidemia, cognitive impairment	<p>Green tea contains phytoestrogens including beta-sitosterol and the lignan precursors Matairesinol and Secoisolariciresinol³⁰</p> <p>May inhibit 5 alpha-reductase³¹</p>

Guggul	<i>Commiphora mukul</i>	Hyperlipidemia, OA	<p>Guggulsterones act as agonists of the pregnane X receptor (PXR), estrogen-alpha receptor, and progesterone receptor. The PXR induces the expression of the cytochrome P450 enzyme CYP3A4</p> <p>May be additive or antagonistic with other herbs that have estrogenic activity</p> <p>May increase the adverse effects of contraceptive drugs through estrogen-alpha receptor agonist activity</p> <p>May increase the adverse effects of hormone replacement therapy through estrogen-alpha receptor agonist activity</p> <p>May have agonist effects on estrogen-alpha and progesterone receptors³²</p>
Kava	<i>Kava kava</i>	Anxiolytic, attention deficit-hyperactivity disorder (ADHD), insomnia	Interferes with cholesterol metabolism ³³
Licorice	<i>Glycyrrhiza glabra</i>	Corticosteroid activity, ulcers, gastritis, dyspepsia, anti-viral	<p>May have dose-dependent estrogenic action¹¹</p> <p>Glabridin constituent may have an estrogen receptor-dependent growth-promoting effect at low concentrations³⁴</p>
Melatonin	<i>N-acetyl-5-methoxytryptamine</i>	Sleep disturbance, circadian-rhythm disruption	<p>May reverse or reduce menopause related changes in thyroid hormone, luteinizing hormone (LH), and follicle stimulating hormone (FSH) in menopausal women³⁵</p> <p>High doses might inhibit ovulation, causing a contraceptive effect³⁶⁻³⁸</p> <p>There is preliminary evidence that very high melatonin doses plus norethisterone can have additive or synergistic effects on inhibiting ovarian function in women and possibly act as a contraceptive^{36, 39}</p> <p>In perimenopausal women, melatonin has caused a resumption of spotting or menstrual flow⁴⁰</p>
Milk thistle	<i>Silybum marianum</i>	Chronic inflammatory liver disease, hepatic cirrhosis, and chronic hepatitis	May enhance estradiol binding to estrogen receptors, induce transcription activity in estrogen-responsive cells ¹⁰

Red clover	<i>Trifolium pratense</i>	PMS, menopausal symptoms	<p>May as selective estrogen-receptor modulators (SERMs)^{41,42}</p> <p>In postmenopausal women with low endogenous estrogens, isoflavones are likely to act as weak estrogens⁴³⁻⁴⁸</p> <p>May inhibit aromatase, which converts androstenedione to estrone, which is associated with endometrial cancer⁴⁹</p>
Reishi mushroom	<i>Ganoderma lucidum</i>	Enhancing the immune function, HTN, chronic fatigue syndrome (CFS)	Inhibits 5-alpha reductase ^{50, 51}
Resveratrol	<i>3,4',5-stilbenetriol; 3,5,4' - trihydroxystilbene; 3,4',5-trihydroxystilbene; 3,5,4'-trihydroxy-trans-stilbene</i>	Atherosclerosis	<p>Resveratrol is a weak phytoestrogen^{24, 25}</p> <p>Trans-resveratrol has mixed agonist and antagonist activity on the estrogen-alpha receptor, whereas cis-resveratrol has significantly less activity at the estrogen receptor²⁶</p>
Saint John's Wort	<i>Hypericum perforatum</i>	Depression, seasonal affective disorder, menopausal symptoms	Induce the cytochrome P450 enzymes responsible for metabolism of progestins and estrogens in contraceptives and endogenous androgens ^{52, 53}
Saw palmetto	<i>Serenoa repens</i>	BPH, chronic non-bacterial prostatitis, PCOS	Inhibit 5 alpha-reductase types 1 and 2 ⁵⁴
Schisandra sinensis	<i>Schisandra sinensis</i>	Hepatic disease, cognitive function	Some evidence suggests schisandra fruit is a uterine stimulant ^{55, 56}
Soy	<i>Glycine max</i>	Menopausal symptoms, osteopenia, PMS, cancer prevention	<p>Structural similarity to estradiol and selective estrogen-receptor modulators (SERMs)^{43, 46} and binds to both the alpha- and beta-estrogen receptors^{48, 57-60} creating an estrogenic effect</p> <p>Some researchers suggest the estrogenic effects of soy may increase the risk of breast cancer⁶¹</p> <p>In vitro data suggest that soy can stimulate proliferation of normal human breast tissue^{62, 63} and has a modest effect on plasma hormones^{45, 64, 65}</p> <p>May inhibit aromatase thereby increasing endometrial cancer risk^{49, 66}</p>

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