

ENDOCRINE SYSTEM ACTIONS AND HERBS

Endocrine Glands: In general, all bitter, adaptogenic and alterative herbs will affect the endocrine system. Here is a list of the endocrine system's glands and the herbs and formulae that are specific to each of them.

Adrenals:

-paired glands superior to kidney and contain two functional regions, an inner medulla surrounded by and outer adrenal cortex, which makes up the bulk of the gland

Adrenal Cortex

-the adrenal cortex secretes three distinct classes of hormones: Mineralcorticoids, glucocorticoids, and gonadocorticoids

Mineralcorticoids help to maintain water and electrolyte balance

(primarily Na⁺ and K⁺), 95% of mineralcorticoids is Aldosterone

Aldosterone acts upon the kidney tubules to increase reabsorption of Na⁺ and thus prevents sodium depletion

the reabsorption of Na⁺ also leads to reabsorption of Cl⁻ and HCO₃⁻ and the retention of water, at the same time, aldosterone promotes K⁺ excretion and excretion of H⁺ which prevents acidosis

the control of aldosterone secretion involves at least two mechanisms:

-the renin-angiotensin pathway promotes the secretion of aldosterone in response to a decrease in blood volume from dehydration, and, promotes vasoconstriction

-another mechanism is the increased volume of K⁺ in the extracellular fluid, which causes the kidneys to eliminate excess K⁺

Glucocorticoids: Cortisol, corticosterone, and cortisone

of the three, cortisol is the most abundant, responsible for 95% of the activity of the glucocorticoids - they have 3 basic effects:

- promotes normal metabolism and ensures that sufficient ATP is available, promoting gluconeogenesis

- glucocorticoids also promote lipolysis and the release of fatty acids from adipose tissue

- provides resistance to stress by increasing glucose availability in the manufacture of ATP

- glucocorticoids also make blood vessels more sensitive to vasoconstrictive chemicals, raising blood pressure, especially when there is a decrease in blood volume due to blood loss

-inhibits inflammation, by reducing the number and size of the mast cells that secrete histamine, by reducing the release of lysosomal enzymes, by decreasing blood capillary permeability and by depressing phagocytosis - in this way, glucocorticoids also retard wound healing and depress the immune system

-the control of glucocorticoid secretion is a negative feedback mechanism in which low levels of glucocorticoids result in the release of the hypothalamic hormone corticotropin releasing hormone(CRH), and as a result, the secretion of ACTH(Adrenocorticotrop hormone)

-in response to stress, the hypothalamus will also increase CRH secretion

Gonadocorticoids, are called estrogens and androgens

-in men, the level of androgens such as testosterone secreted by the adrenal cortex is minimal to that which is secreted by the testes

-in women however, adrenal androgens contribute significantly to libido and sexual behaviour, additionally, androgens can be converted into estrogens, which an important source of estrogens when the estrogen producing ovaries atrophy after menopause

Adrenal Medulla

-the adrenal medulla secretes norepinephrine(NE) and epinephrine(E) which belong to a class of compounds called catecholamines

-Epinephrine, and to a lesser extent, norepinephrine, are concentrated in the tissues of the adrenal medullae and are secreted in response to sympathetic stimulation

-the adrenal medullae are actually modified sympathetic ganglionic fibers as opposed to and actually endocrine gland, and secrete E and NE directly into the bloodstream

-as previously mentioned, all of the catecholamines require tyrosine as the base nutrient for their creation

Avena sativa (Milky Oats, *Poaceae*, Grass Family)

Adrenal trophorestorative, oats/oat bran reduces total and LDL cholesterol, shows efficacy in opium and cigarette addiction, can be used as a tea/tincture or eaten as oatmeal

Oatmeal uses: Skin rashes/chicken pox, digestive fibers

Hypercholesterolemia: Soluble fibers, such as beta-glucan, lower cholesterol levels by binding with bile acids in the gut and increasing fecal bile acid excretion. This decreases enterohepatic circulation of bile acids, which increases hepatic conversion of cholesterol to bile acids, increases up-regulation of low-density lipoprotein (LDL)-receptors, and increases clearance of LDL cholesterol.

Diabetes: Beta-glucan increases the viscosity of food in the small intestine and delays absorption, thereby reducing peak postprandial plasma glucose and insulin levels both in people with and without diabetes.

Borago officinalis (Borage, *Boraginaceae*, Borage Family)

Improves milk production and quality in mammals, farmers encourage animals to eat fresh borage, nourishing

Bupleurum falcatum (Chai Hu, *Apiaceae*, Carrot Family)

Stimulates corticosteroid production, nourishing, anti inflammatory to liver

Dioscorea villosa (Wild Yam, *Dioscoreaceae*, Yam Family)

Stimulates corticosteroid production, nourishing, antispasmodic

Eleutherococcus senticosus (Siberian ginseng, *Araliaceae*, Ginseng Family)

Adaptogen, tonic, stimulant, protects the immune system

Improves stress tolerance, nourishing, has an antiproliferative effect on leukemia cells, stimulates immune function through improved phagocyte activity. Shown positive results in the following: immune systems of cancer patients, working capacity, heart structure in myocardial infarctions, arrhythmias and other heart diseases, diabetes, antimicrobial action and prenatal prevention of congenital developmental anomalies. It has also been shown to produce anti-edemic, diuretic, anti-hypertensive and anti-inflammatory effects

<p><i>Panax ginseng</i> (Red ginseng, <i>Araliaceae</i>, Ginseng Family) Warm qi tonic, stimulant (can be overstimulating for 'heat' pictures), aphrodisiac, reduces blood sugar</p>
<p><i>Panax quinquefolius</i> (North American ginseng, <i>Araliaceae</i>) cooling qi tonic, nourishing, nutritious, reduces blood sugar, not as stimulating as <i>P. ginseng</i></p>
<p><i>Urtica dioica fol./sem.</i> (Nettle leaf/seed, <i>Urticaceae</i>, Nettle Family) Has a dramatic effect on reducing creatinine levels and improving GFR (markers of kidney activity/life force activity), excellent adrenal tonic, taken as tea or tincture, high in protein and minerals</p>
<p><i>Withania somnifera</i> (Ashwagandha, <i>Solanaceae</i>, Nightshade Family) Similar qualities to ginsengs i.e stress tolerance, cognitive enhancement, blood building (increased hemoglobin concentration, RBC and WBC counts), and immunopotentiating activities. Has an overall sedative action on the CNS, as opposed to <i>P. ginseng</i> which can be stimulating and cause difficulty with sleeping</p>
<p>Mammary-Pituitary: Prolactin initiates and maintains milk secretion by the mammary glands. The actual ejection of milk however is initiated by oxytocin. Together, the activities of prolactin and oxytocin that result in milk secretion and ejection are referred to as lactation. The monoamine dopamine (also called prolactin inhibiting hormone, or PIH) inhibits the release of prolactin from the pituitary gland. A slight decrease in dopamine levels in the luteal phase of the menstrual cycle, resulting in increased prolactin, can cause premenstrual breast tenderness.</p>
<p><i>Foeniculum vulgare</i> (Fennel seed, <i>Apiaceae</i>, Carrot Family) Improves volume of milk production and its fat content Theory: The chemical similarity of anethole (large fraction of volatile oil, 60-80%) with dopamine may explain why Fennel enhances lactation, competing for receptor sites and generally down-regulating the inhibitory activity of dopamine upon prolactin secretion</p>
<p><i>Borago officinalis</i> (Borage, <i>Boraginaceae</i>, Borage Family)</p>
<p><i>Galega officinalis</i> (Goat's Rue, <i>Fabaceae</i>, Pea/Legume Family)</p>
<p><i>Trigonella foenum-graecum</i> (Fenugreek, <i>Fabaceae</i>, Pea/Legume Family)</p>
<p><i>Vitex agnus-castus</i> (Chaste tree, <i>Lamiaceae</i>, Mint Family) Stimulates the pituitary gland to produce more LH (luteinizing hormone) which stimulates production of progesterone. Chasteberry has the effect of stimulating and normalizing pituitary gland functions, especially its progesterone function. It may be called an amphoteric (either/or) remedy, as it can produce apparently opposite effects, in truth it is simply normalizing. It will usually enable what is appropriate. □</p>
<p>Ovaries-Pituitary: The regulation of hormonal secretion begins with the hypothalamus that produces gonadotropin-releasing hormone (GnRH). This hormone then activates the pituitary gland to secrete luteinizing hormone (LH) and follicle stimulating hormone (FSH), which in turn activates the ovaries to secrete estrogen and progesterone.</p>
<p><i>Vitex agnus-castus</i> (Chaste tree, <i>Lamiaceae</i>, Mint Family) Stimulating but ultimately normalizing</p>
<p>Pancreas: -scattered throughout pancreas are tiny clusters of endocrine tissues called islets of Langerhans, and there are four types of cells that secrete hormones -alpha cells secrete glucagon, which raises blood glucose levels -beta cells which secrete insulin, which lowers blood glucose levels -delta cells which secrete somatostatin which acts as a paracrine gland to inhibit the secretion of insulin and glucagon -F cells secrete pancreatic polypeptide that regulates the exocrine pancreas -the pancreas plays a major role in endocrine function, but also digestion -it secretes pancreatic juice in volumes between 1200mL and 1500mL daily -the juice is comprised of water, salts, sodium bicarbonate, and several enzymes -the enzymes are able to digest all the major macronutrients</p>
<p><i>Chionanthus virginicus</i> (Fringe tree, <i>Oleaceae</i>, Olive Family) decongestant, anti-inflammatory, stimulates glandular secretions by reducing congestion</p>
<p><i>Cinnamomum verum</i> (True cinnamon, <i>Lauraceae</i>, Laurel Family) Regulates blood sugar, warming</p>
<p><i>Codonopsis pilosula</i> (Bonnet Bellflower, <i>Campanulaceae</i>, Bellflower Family) Similar qualities of ginsengs, nourishing, regulates blood sugar</p>
<p><i>Galega officinalis</i> (Goat's Rue, <i>Fabaceae</i>, Pea/Legume Family) Tastes a bit like cinnamon, regulates blood sugar</p>
<p><i>Gymnema sylvestre</i> (Gurmar, <i>Apocynaceae</i>, Dogbane Family) Reduces/inhibits sensation of 'sweet' from taste buds, also reduces blood sugar</p>
<p><i>Trigonella foenum-graecum</i> (Fenugreek, <i>Fabaceae</i>, Pea/Legume Family)</p>

Oplopanax horridum (Devil's Club, *Araliaceae*, Ginseng Family)

Good for children with blood sugar problems

Panax ginseng (Red/Korean Ginseng, *Araliaceae*, Ginseng Family)

Warming, qi tonic, blood sugar

Panax quinquefolius (North American Ginseng, *Araliaceae*, Ginseng Family)

Cooling, nutritive, qi tonic, blood sugar

Pterocarpus marsupium

Beta cell repair/regranulation

Vaccinium myrtillus (Blueberry, *Ericaceae*, Heath Family)

Improves blood sugar, astringent, contains vaso-epithelial growth factors and flavonoids for repair, improves blood vessel/capillary integrity

Pituitary:

-two distinct anatomical regions that have separate functions

-**anterior pituitary** - over 75% of mass, contains mostly glandular epithelial cells

-release of hormones manufactured is stimulated by the releasing of hormones and suppressed by inhibiting hormones secreted from the hypothalamus

-**posterior pituitary**- contains axons and axon terminals and secretes ADH and oxytocin

-there are five principal cell types that are affected by the release and inhibiting hormones of the hypothalamus that in turn secrete seven major hormones

Somatotrophs- produce human growth hormone(hGH) that stimulates body growth and helps regulate metabolism

Lactotrophs- synthesize prolactin which initiates milk production and the mammary glands of the breast

Corticotrophs- synthesize adrenocorticotrophic hormone(ACTH), which stimulates the adrenal cortex to secrete glucocorticoids; some corticotrophs also secrete melanocyte stimulating hormone(MSH) to affect skin pigmentation

Thyrotrophs- synthesize thyroid stimulating hormone(TSH) that induces hormone production in the thyroid gland

Gonadotrophs- synthesize follicle stimulating hormone(FSH) and luteinizing hormone(LH) which manage reproductive activities in the body

Hypothalamus

- the control and integration of the activities of the ANS(smooth and cardiac muscle contraction, glandular secretion, heart rate, movement of food through GIT, contraction of urinary bladder)

-rage and aggression responses

-regulation of body temperature

-regulation of food intake through the inhibitory activity of the satiety center

-regulation of thirst, stimulated by the rising osmotic pressure in the extracellular fluid

-assisting in the coordination of arousal and sleep patterns

-in the middle of the hypothalamus is the tuber cinereum, a mass of gray matter that connects to the infundibulum, which connects the hypothalamus to the pituitary

-the tuber cinereum contains neurons that synthesize the hypothalamic regulating hormones that regulate the hormonal secretions of the anterior pituitary gland

-nerve fibers extend from the hypothalamus to form the supraoptico hypophyseal tract extending into the infundibulum to the posterior pituitary, transporting antidiuretic hormone(ADH) and oxytocin

Stachys officinalis (Wood Betony, *Lamiaceae*, Mint Family)

Vitex agnus-castus (Chaste tree, *Lamiaceae*, Mint Family)

Stimulating and normalizing

Spleen:

The spleen is comprised of two distinct types of tissue: white pulp and red pulp. White pulp is lymphatic tissue, mostly lymphocytes, arranged around central arteries; red pulp consists of venous sinuses filled with blood, and cords of splenic tissue consisting of red blood cells, macrophages, lymphocytes, plasma cells and granulocytes.

Unlike lymph nodes, the spleen has no afferent lymphatic vessels and thus does not filter lymph. It is a site of B cell proliferation into plasma cells, phagocytosis of bacteria and worn out RBCs and platelets, and a blood reservoir, releasing blood in times of demand, such as during hemorrhage.

Achillea millefolium (Yarrow, *Asteraceae*, Sunflower Family)

'moves blood'

Alchornea cordifolia (*Euphorbiaceae*, Spurge Family)

Astragalus membranaceus (Milk Vetch, *Fabaceae*, Pea/Legume Family)

Improves the function of immunocompetent tissues or cells throughout GI tract, nourishing to blood, 'blood building for deficient blood'

Baptisia tinctoria (Wild Indigo, *Fabaceae*, Pea/Legume Family)

Ceanothus americanus (Red Root, *Rhamnaceae*, Buckthorn Family)

Decongestant, improves fluid dynamics of blood

Eleutherococcus senticosus (Siberian Ginseng, *Araliaceae*, Ginseng Family)

Strengthens immune system, improves phagocytosis

Iris versicolor (Blue Flag, *Iridaceae*, Iris Family)

Strong lymphatic/purgative, stimulates liver, involved in many formulas for cleansing the blood in Europe

Lentinus edodes (Shiitake, *Marasmiaceae*, Basidiomycete Fungus)

nourishing, bitter, used in TCM for circulatory disorders, normalizes immune activity, used for a variety of virus (HIV)

Medical research: Lentinan has been shown to activate natural killer (NK) cells *in vitro* as well as T-helper cells, interleukin 2, interleukin 1, Igs production, interferon, macrophage secretion and produce cytokines

Ligustrum lucidum (Glossy Privet, *Oleaceae*, Olive Family)

Polygonum multiflora (He shou wu, *Polygonaceae*, Buckwheat Family)

Tonifies the Liver and Kidneys, nourishing the blood, while augmenting the essence. It is specific for yin or blood deficiency such as dizziness, blurred vision, premature graying with lower back, knee pain and insomnia.

Schisandra chinensis (Five-Flavour Berry, *Schisandraceae*, Schisandra Family)

Spleen deficiency

Testes-Prostate:

At the onset of male puberty the anterior pituitary secretes FSH and LH in response to GnRH secretion by the hypothalamus. FSH initiates spermatogenesis by stimulating the Sertoli cells, and LH stimulates the Leydig cells to secrete testosterone, created from cholesterol in the testes. Like women, the hypothalamus pulses GnRH about every 60 to 90 minutes, and if testosterone levels drop a negative feedback loop enhances the secretion of GnRH, FSH and LH.

Testosterone is the primary male androgen, but some tissues aren't responsive to it until it becomes metabolized into dihydrotestosterone by the enzyme 5-alpha-reductase. Thus, testosterone is both a hormone and a hormone precursor. Testosterone is the most potent of the androgens; responsible for primary and secondary male sexual development, the initiation of the sex drive, and aggressiveness, it also promotes protein synthesis.

The prostate gland is a chestnut sized, doughnut-shaped gland, inferior to the urinary bladder, surrounding the superior portion of the urethra. It secretes a milky, slightly acidic fluid that contains citric acid and several enzymes, making up about 25% of the total semen volume.

The prostate gland is an endocrine-dependent organ, and the absence of testosterone will cause it to atrophy. Some commentators equate it with the uterus, and although it does not display cyclical changes, it does function to nourish and protect the sperm cells. One theory suggests that the outer mass of prostatic tissue is responsive to androgens, whereas the inner mass is responsive to estrogen. Thus prostate diseases can be related to either an excess of testosterone or an excess of estrogen.

Avena sativa (Milky Oats, *Poaceae*, Grass Family)

Nutritive, high in minerals, restorative

Impotence in men under middle age; from nervous exhaustion, sexual excess, nocturnal emissions, swollen prostate with neurasthenia (debility, weakness, paralysis)

Epimedium grandiflorum (Bishop's Hat, *Berberidaceae*, Barberry Family)

Ginkgo biloba (Ginkgo Tree, *Ginkgoaceae*, Ginkgo Family)

Panax ginseng (Red/Korean Ginseng, *Araliaceae*, Ginseng Family)

Adaptogen, nervine, tonic, aphrodisiac

Indicated in sexual/erectile dysfunction, activates/stimulates adrenals

Prunus africana (African Cherry, *Rosaceae*, Rose Family)

SARM- Selective androgen receptor modulator

Thymus:

A bi-lobed lymphatic organ. Each lobe is comprised of two functional parts: a **cortex** and a **medulla**; cortex tightly packed lymphocytes, maturing T cells that have migrated from bone marrow; medulla epithelial cells produce thymic hormones which aid in the development of the T cells, and widely scattered lymphocytes. The Thymus gland produces a hormone called **thumosterone** that migrates directly into the nucleus of a cancerous cell, erasing the dysfunctional genetic activity, either killing the cell or reverting it back to normal.

Achillea millefolium (Yarrow, *Asteraceae*, Sunflower Family)

Astragalus membranaceus (Milk Vetch, *Fabaceae*, Pea/Legume Family)

Bupleurum falcatum (Chai hu, *Apiaceae*, Carrot Family)

Echinacea angustifolia (Purple Cone Flower, *Asteraceae*, Sunflower Family)

Eleutherococcus senticosus (Siberian Ginseng, *Araliaceae*, Ginseng Family)

Ganoderma applanatum/lucidum/tsugae (Reishi Mushroom, *Ganodermataceae*)

Glycyrrhiza glabra (Licorice, *Fabaceae*, Pea/Legume Family)

Lentinus edodes (Shiitake, *Marasmiaceae*, Basidiomycete Fungus)

Panax ginseng (Red/Korean Ginseng, *Araliaceae*, Ginseng Family)

Panax quinquefolius (North American Ginseng, *Araliaceae*, Ginseng Family)

Tahebuia impetigosa (Pau D'Arco, *Bignoniaceae*, Bignonia Family)

Thymus vulgaris (Common Thyme, *Lamiaceae*, Mint Family)

Viscum album (Mistletoe, *Santalaceae*, Sandalwood Family)

Thyroid:

-contained in the thyroid are microscopic spherical sacs called **thyroid follicles** that manufacture the thyroid hormones **thyroxine(T4)**, made with four atoms of iodine, and **triiodothyronine(T3)**, made with three atoms of iodine

-a few other follicles in the thyroid produce calcitonin

-Iodine is an important rate limiting factor in the synthesis of thyroid hormones

-it is ingested in food and water, and is actively taken up by the follicular cells of the thyroid, which under the influence of **thyroid stimulating hormone(TSH)**, uses it and the amino acid **thyrosine** to form T3 and T4

-T3 and T4 are released from the thyroid where they are bound to thyroid hormone-binding serum proteins for transport

-Thyroid binding globulin(TBG) accounts for 75% of thyroid hormone-binding proteins - high affinity but low capacity for T4 and T3

-other thyroid hormone-binding serum proteins are **transthyretin(prealbumin)**, which has a high affinity but low capacity for T4, and **albumin**, which has a low affinity but high capacity for T3 and T4

-increased levels of free thyroid hormones T3 inhibit TSH secretion from the pituitary, whereas decreased levels of T4 and T3 result in an increased TSH release from the pituitary

-of the two hormones, T3 is thought to be metabolically active, but T4 can be deiodinated into T3 upon cell uptake

-TSH secretion however is also influenced by **thyrotropin-releasing hormone (TRH)**, an amino acid peptide synthesized in the hypothalamus, which binds to a specific TRH receptor on the thyrotropic cells of the anterior pituitary and causes the subsequent release of TSH

-the thyroid hormones function to **increase protein synthesis** and **O2 consumption** in virtually every tissue of the body, ultimately increasing the **basal metabolic rate**

-increases basal metabolic rate and temperature of the body by stimulating the use of cellular oxygen to produce ATP

-regulates metabolism by stimulating protein synthesis, lipolysis, cholesterol secretion in the bile and in the use of glucose for ATP manufacture

-accelerates body growth and in particular that of the nervous tissue, in association with hGH and insulin

-thyroid hormones also enhance the activity of the catecholamines **epinephrine** and **nor-epinephrine** due to upregulation of B-receptors

-excess levels of thyroid hormones, eg. hyperthyroidism cause increased myocardial contractions, an increased blood pressure and nervous irritability

-the control of thyroid activity is dependent upon the level of iodine and by a negative feedback system that involves the hypothalamus and the anterior pituitary

-low blood levels of T3 cause the hypothalamus to secrete TRH, which in turn causes the pituitary to secrete TSH

- increased ATP demand, such as cold temperature, hypoglycemia, high altitude, all trigger negative feedback mechanisms to increase the secretion of thyroid hormones

-Calcitonin along with parathormone secreted by the parathyroid gland, regulates calcium metabolism in the body

-calcitonin lowers blood calcium and phosphates by accelerating uptake by the bones and inhibiting the activity of osteoclasts

-the secretion of calcitonin is stimulated by high blood calcium levels(hypercalcemia)

Parathyroid

-attached to the posterior surface of the thyroid gland and in most cases, are two small round masses on each lobe of the thyroid

-secretes a hormone called **parathormone(PTH)**, which functions to increase blood calcium and magnesium levels and phosphate by increasing the activity of osteoclasts

-PTH also activates vitamin D(calcitriol) in the kidneys, increasing the absorption of calcium and magnesium from the small intestine, and promoting the excretion of phosphate by the kidneys

Herbs for Hypothyroidism:

Ascophyllum nodosum (Norwegian Kelp, *Fucaceae*, Brown Algae Family)
Salty, mucilage, nourishing, iodine

Daucus carota (Wild Carrot, *Apiaceae*, Umbel Family)

Fucus vesiculosus (Bladderwrack, *Fucaceae*, Brown Algae)
Salty, mucilage, nourishing, iodine

Juglans nigra (Black Walnut, *Juglandaceae*, Walnut Family)
Bitter, nutritious, iodine, walnut flower was a well utilized starch/food in native tradition

Laminaria digitata (Oarweed, *Laminariaceae*, Brown Algae Seaweeds)
Salty, mucilaginous, nourishing, iodine

Herbs for Hyperthyroidism

Leonurus cardiaca (Motherwort, *Lamiaceae*, Mint Family)
Relaxing, calming

For excessive sweating, palpitations, nervous anxiety, and tiredness, cardiac irritation/agitation

Lycopus virginicus (Bugleweed, *Lamiaceae*, Mint Family)
Relaxing nervine, cardiac irritation/agitation
Specific for hyperthyroid symptoms
Causes a reduction in serum and pituitary TSH levels

Melissa officinalis (Lemon Balm, *Lamiaceae*, Mint Family)
Causes a reduction in serum and pituitary TSH levels

Chemistry: Plant constituents found to be active in preventing this TSH binding include caffeic acid, rosmarinic acid (both found in Melissa and Thymus), chlorogenic acid and ellagic acid (all found in Lithospermum and Lycopus species) and norhydroguaiaretic acid (found in Larrea tridentata). This is due to their auto-oxygenation to an orthoquinone form that combines with the protein moiety of TSH

SUMMARY OF ACTIONS

In general, all bitter, adaptogenic and alterative herbs will affect the endocrine system.

Here is a list of the endocrine system's glands and the herbs and formulae that are specific to each of them.

ADRENALS

Avena sativa, *Borago off.*, *Bupleurum chinensis*, *Dioscorea villosa*, *Eleutherococcus senticosus*, *Glycyrrhiza glabra*, *Panax ginseng*, *Panax quinquefolius*, *Urtica dioica fol.*, *Withania somnifera*, ADRENOCORT SUPPORT, DEEP IMMUNE ACTIVATION, THREE GINSENGS TONIC
(see above for formulae contents)

MAMMARY-PITUITARY

LACTAID: *Foeniculum vulgare*, *Borago off.*, *Galega off.*, *Trigonella foenum-graecum*, *Vitex agnus-castus*

OVARIES-PITUITARY

PROMOFLO, CHANGE OF LIFE, DEEP IMMUNE ACTIVATION, FEM TONIC, FLUX REDUX, UTEROTONER, GLUCO COMBO (See Female Reproductive System): *Vitex agnus-castus*

PANCREAS

GLUCO COMBO: *Chionanthus virginicus*, *Cinnamomum zeylanicum*, *Codonopsis pilosula*, *Galega off.*, *Gymnema sylvestre*, *Trigonella foenum-graecum*, *Oplonanax horridum*, *Panax ginseng*, *Panax quinquefolium*, *Vaccinium myrtillus*

For type II diabetes, the glycemic index of the diet and the blood glucose levels must be monitored by a professional until stability is reached. *Chionanthus virginica* may be an aid in pancreatitis. THREE GINSENGS TONIC may also be an aid in glucose regulation with regular use.

PITUITARY

Stachys off., *Vitex agnus-castus*

SPLEEN

Achillea millefolium, *Alchornea cordifolia*, *Astragalus membranaceus*, *Baptisia tinctoria*, *Ceanothus americanus*, *Eleutherococcus senticosus*, *Iris versicolor*, *Lentinus edodes*, *Ligusticum lucidum*, *Polygonum cuspidatum*, *Schisandra chinensis*

TESTES/ PROSTATE

VITAL MAN, PROST AID: *Avena sativa*, *Epimedium grandiflorum*, *Ginkgo biloba*, *Panax ginseng*, *Prunus africana*, *Ptychopetalum olacoides*, *Serenoa serrulata*, *Tribulus terrestris*, *Turnera diffusa*, *Smilax spp.*

THYMUS

Achillea millefolium, *Astragalus membranaceus*, *Bupleurum chinensis*, *Echinacea angustifolia*, *Eleutherococcus senticosus*, *Ganoderma spp.*, *Glycyrrhiza glabra*, *Lentinus edodes*, *Panax ginseng*, *Panax quinquefolius*, *Tahebuia impetigosa*, *Thymus vulgaris*, *Viscus album*, DEEP IMMUNE ACTIVATION

THYROID

Ascophyllum nodosum, *Fucus vesiculosus*, *Juglans nigra*, *Laminaria digitata*, THYROCALM, THYROSTIM
Leonurus cardiaca, *Lycopus virginicus*, *Melissa officinalis*