

**Body Biochemicals**

**Test Kits 1-8**

**Plus**

**Hormones Test Kit**

## BODY BIOCHEMICAL 1 TEST KIT (25 vials)

Product Code 8004

**Neurotransmitters:** chemical released from nerve endings that transmit impulses from one neuron (nerve cell) to another neuron or to a muscle cell. (BMA Family Health)

**Neuropeptides:** small proteins consisting of larger molecules than neurotransmitters (BMA Family Health); modulate the response of or to a neurotransmitter

**Second messenger** released inside the cell, where hormone-stimulating responses can take place

Code	Name	Type	Location And Role	Comments
BB1	Acetylcholine/ ACh	Neurotransmitter	At all nerve-muscle junctions as well as many other sites in the nervous system; contraction of skeletal muscles, control of sweat glands and heart beat; transmits messages between neurons in the brain and spinal cord.	Myasthenia gravis and Alzheimer's disease; nicotine mimics this neurotransmitter.
BB2	Angiotensin I	Protein	Converted by angiotensin converting enzyme into angiotensin II.	ACE inhibitor drugs work by reducing the conversion of angiotensin I to angiotensin II.
BB3	Angiotensin II	Neuropeptide	Produced from renin released by kidneys; stimulates thirst; promotes release of aldosterone, which increases the rate of salt and water re-absorption from the kidneys; vasoconstriction of arterioles to increase blood pressure.	ACE inhibitor drugs work by reducing the conversion of angiotensin I to angiotensin II.
BB4	Bilirubin	Metabolic waste product	Yellow pigment that is one of the end products of hemoglobin breakdown in the liver, spleen and bone marrow and is excreted as a waste material in the bile; associated with jaundice.	Products formed from the breakdown of bilirubin are responsible for the brown color of stools.
BB5	Bombesin	Peptide	Stimulates release of gastric and pancreatic hormones; contraction of the smooth muscles in gastric and urinary tract, and in the uterus; can inhibit the secretion of growth hormone; itching and lowered body temperature.	
BB6	Cathepsin C	Enzyme	Found in skin and bone cells, activates several of the chemicals controlling local immune and inflammatory responses; gum health; Papillon-Lefèvre syndrome (warty thickened skin, principally on hands and soles of feet; periodontitis and gingivitis).	
BB7	Cholesterol	Lipid	From food and also synthesized in liver; most abundant steroid in animal tissue; synthesis of steroid hormones and bile salts; stabilizing cell membranes.	
BB8	Complement C7	Protein	In blood; part of non-specific resistance and immunity; enhance allergic and inflammatory reactions; with other complement proteins forms large holes in the microbe, allowing fluid to flow in and the microbe then bursts.	One of at least 20 different proteins.

Code	Name	Type	Location And Role	Comments
BB9	C-Reactive Protein	Protein	Necessary for acute stage of inflammation but inappropriate for chronic stage; effective against bacteria, parasites and immune complexes; synthesized by liver.	Elevated levels indicate an increased risk of heart attack and stroke in the future, and are associated with increased risk of psychological distress and depression.
BB10	Cyclic Adenosine-3',5' – monophosphate/ Cyclic AMP		Formed from ATP by action of adenylate cyclase; serves as second messenger for some hormones; increase in cAMP causes adipose cells to break down triglycerides and release fatty acids more rapidly; stimulates thyroid cells to secrete more thyroid hormone.	
BB11	Cyclic Guanosine-3',5' – monophosphate/ Cyclic GMP		Mediation of certain hormones and neurotransmitters such as acetylcholine, prostaglandins and histamine; involved in light/dark adaptation of the eye.	
BB12	Dopamine/Da	Neurotransmitter	In parts of the brain that control subconscious movement of skeletal muscles; regulating muscle tone; increases the efficiency of the heartbeat and helps return the blood pressure to normal; involved in emotional responses.	Decreased levels associated with Parkinson's disease; may be involved with schizophrenia, ADD, autism, and La Tourette's syndrome.
BB13	Dynorphin A	Neuropeptide	In brain and small intestine; may be related to controlling pain and registering emotions.	
BB14	β- Endorphin (Beta Endorphin)	Neuropeptide	In brain, spinal cord, pancreas and testes; control of sensitivity to pain by inhibiting substance P; control of body's response to stress; regulation of contraction of intestinal wall; affects mood; may also regulate the release of hormones from the pituitary gland; may have a role in memory and learning, sexual activity and control of body temperature.	Morphine has a similar chemical structure; linked to depression and schizophrenia.
BB15	Histamine	Biogenic amine	in cells, mainly mast cells throughout the body, released during an allergic reaction and inflammation; narrows bronchi in lungs, increases permeability of blood vessels, lowers blood pressure, causes itching and stimulates production of acid in the stomach; secretion of digestive juices; Carl Pfeiffer has suggested too much histamine is involved in some forms of alcoholism.	May be implicated in some types of schizophrenia.
BB16	Hyaluronic Acid	Combination of polysaccharides and proteins	Extra-cellular, viscous material that binds cells together, lubricates joints and maintains shape of the eye ball; may help phagocytes migrate through connective tissue during development and wound healing.	Co-factors are N-acetyl glucosamine and glucuronic acid.
BB17	Hydrochloric Acid	Acid	Produced by gastric glands in the stomach to aid protein digestion by preparing proteins for the later stages of digestion; also prevents bacterial growth in the stomach.	Excessive acid production may be stimulated by stress or tobacco smoking.

Code	Name	Type	Location And Role	Comments
BB18	Interferon / Alpha-Interferon/ Intron A	Protein	Fight infection; made by certain white blood cells; naturally produced by virus-infected host cells that induce unaffected cells to synthesize antiviral proteins and so stops many viruses from replicating within body cells.	Have been used to treat cancer, immunodeficiency disorders, chronic infection with hepatitis B & C and chronic genital herpes; 2 other types – beta and gamma.
BB19	Myoglobin	Protein	Found only in muscle fibers; binds oxygen molecules that are needed for ATP production within mitochondria.	
BB20	Pyruvic Acid	Carbohydrate	A by-product of glycolysis (production of ATP from glucose); may be converted into lactic acid, alanine or oxaloacetic acid.	
BB21	Serotonin/ 5-Ht	Neurotransmitter	In parts of the brain, blood platelets, lining of digestive tract; concerned with conscious processes, involved in controlling states of consciousness and mood; sensory perception; temperature regulation; released at site of bleeding to constrict small blood vessels and control blood loss; inhibits gastric secretion and stimulates smooth muscles in the intestinal wall; inducing sleep; inhibits release of prolactin; decreases carbohydrate cravings; provides a feeling of fullness; enhances mood.	Action in brain disrupted by some hallucinogenic drugs, particularly LSD; excess serotonin implicated in Raynaud's disease.
BB22	Serum Amyloid P Component	Protein	Accumulates in extra-cellular spaces of many organs in association with different disease processes; inhibits elastase (enzyme concerned with breakdown of protein); necessary for acute stage of inflammation but inappropriate for chronic stage; removes cholesterol and lipid debris from areas of trauma; causes thickening of connective tissue.	Implicated in Alzheimer's disease.
BB23	Substance P	Neuropeptide	In sensory nerves, spinal cord and parts of brain associated with pain – enhances perception of pain; stimulates motility of the intestines; stimulates saliva production and inflammatory responses in tissues.	Endorphins inhibit Substance P; counters the effect of certain nerve-damaging chemicals, so may prove useful as treatment for nerve degeneration.
BB24	Transferrin	Protein	In blood, transports iron; inhibits the growth of certain bacteria by reducing the amount of available iron.	
BB25	Urea	Waste product	Waste product of the breakdown of proteins; the main nitrogenous constituent of urine; formed in the body from the breakdown of cell proteins.	Used in some creams and ointments to moisturize and soften the skin.

**BODY BIOCHEMICAL 2 TEST KIT (25 vials)**  
**Product Code 8005**

Code	Name	Type	Location And Role	Comments
BB26	Acetone / Dimethyl Ketone / 2-Propanone / Beta-Ketopropane		Produced primarily during excessive fat metabolism, although some levels present in virtually every organ and tissue, and the blood contains some acetone.	Occurs naturally in plants, trees, volcanic gases and forest fires. Present in vehicle exhaust, tobacco smoke, and landfill sites; also manufactured and used widely in industry as a solvent in paints and lacquers and for cellulose plastics.
BB27	Adenosine	Neurotransmitter	Affects central nervous system and peripheral nervous system; constituent of ATP and ADP.	May be involved with asthma; stimulatory effect of tea and coffee because inhibit adenosine.
BB28	Adenylate Cyclase	Enzyme	Converts ATP into cAMP within the cell.	
BB29	Albumin/ Albumen	Protein	Produced by liver; most abundant (54%) and smallest of plasma proteins; regulates osmotic pressure of plasma and therefore fluid retention; carrier for metals, ions, fatty acids, amino acids, bilirubin, enzymes and drugs – prevents them being filtered out by the kidneys and excreted in urine.	
BB30	Antithrombin III	Anti-coagulant	Blocks action of clotting agents (factors XII, XI, IX, X and II).	
BB31	Atrial Natriuretic Peptide /ANP/ Atriopeptin	Hormone	Produced in upper chambers of heart; increases excretion of sodium in urine; increases urine output and decreases blood volume; causes blood vessels to dilate; inhibits aldosterone production and lowers blood pressure.	Children with congenital heart disease have high levels of ANP.
BB32	Calcitriol	Hormone	Aids in absorption of dietary calcium and phosphorus; secreted by kidneys; it is the active hormonal form of vitamin D.	
BB33	Cortisol/ Hydrocortisone	Hormone	The principal glucocorticoid <sup>1</sup> ; increases blood glucose levels by increasing cellular utilization of proteins and fats as energy sources thus conserving glucose; stimulates liver cells to produce glucose from amino acids and fats; secretion controlled by ACTH from anterior pituitary; counteracts the inflammatory response.	Also used as a drug for inflammatory or allergic conditions.
BB34	Endothelin-1		Found in brain, intestines, kidneys and heart; most potent vasoconstrictor known; regulates salt transport in intestine.	May be implicated in migraine; increased levels in diabetic and non-diabetic coronary artery disease; increased levels in micro-vascular angina.

Code	Name	Type	Location And Role	Comments
BB35	$\beta$ -Estradiol/ 17 $\beta$ -Estradiol	Hormone	Synthesized from cholesterol in ovaries; predominant oestrogen hormone in non-pregnant women; promotes development and maintenance of female reproductive structures; increases protein anabolism; lowers blood cholesterol; moderate levels inhibit release of the hormones GnRH, FSH and LH.	
BB36	Estriol	Hormone	One of the oestrogen hormones; promotes development and maintenance of female reproductive structures; increases protein anabolism; lowers blood cholesterol; moderate levels inhibit release of the hormones GnRH, FSH and LH.	
BB37	Estrone	Hormone	One of the oestrogen hormones; promotes development and maintenance of female reproductive structures; increases protein anabolism; lowers blood cholesterol; moderate levels inhibit release of the hormones GnRH, FSH and LH.	
BB38	Gamma-Aminobutyrate Acid/GABA	Amino acid and neurotransmitter	Most widely distributed inhibitory neurotransmitter; blocks noradrenaline and dopamine.	Deficiencies found in hypertension and seizures; a target for anti-anxiety drugs.
BB39	Gamma Globulin	Protein	Approximately 38% of blood plasma proteins; carrier for antibodies and so has a role in infection and allergies.	Given as an injection to prevent viral hepatitis.
BB40	Glucagon	Hormone	raises blood sugar levels by accelerating breakdown of glycogen into glucose in the liver, converting other nutrients into glucose in the liver, and releasing glucose into the blood – opposes the action of insulin <sup>1</sup> ; may stimulate the secretion of water and electrolytes by the mucosa of small intestine.	Given by injection in the emergency treatment of people with diabetes mellitus who are unconscious as a result of hypoglycaemia.
BB41	Glutamic Acid/ Glutamate	Amino acid and neurotransmitter	Can be manufactured by the body; precursor of proline, ornithine <sup>3</sup> , arginine and polyamines; a stimulatory neurotransmitter; can be converted in body into GABA; nearly all excitatory neurons in the CNS and possibly half of the synapses in the brain communicate via glutamate; visual adaptation to light and dark.	Many epileptics have increased levels of glutamic acid; part of the acute reaction to withdrawal from drug addiction includes increase production of glutamate.
BB42	Glycine	Amino acid and neurotransmitter	Can be synthesized from other amino acids (serine and threonine <sup>3</sup> ); acts as an inhibitory neurotransmitter; assists in manufacture of DNA, glycerol, phospholipids, collagen, glutathione and cholesterol <sup>2</sup> conjugates; essential for one of key liver detoxification pathways; stimulates secretion of glucagons; in spinal cord (inhibitory action) and in retina.	Parkinson's disease; low levels often found in manic-depressives and epileptics; people with motor neurone disease may have impaired glycine metabolism.
BB43	Gonadotropin Releasing Hormone (GnRH)	Hormone	Secreted by hypothalamus; stimulates release of LH and FSH.	
BB44	Leptin	Hormone	Released by fat cells as they synthesize triglycerides; reduces appetite; believed to inhibit neuropeptide Y; role in central control of bone mass and so possibly osteoporosis; onset of puberty; believed to have an immune system role through support of helper T cells.	Non-insulin dependent diabetes, high blood pressure.
BB45	Neuropeptide Y	Peptide	Present in many parts of the brain and autonomic nervous system; enhances effect of	A gene in roundworms (closely related to the neuropeptide Y receptor gene in

Code	Name	Type	Location And Role	Comments
			norepinephrine; stimulates appetite; causes increased storage of ingested food as fat; regulation of circadian rhythms, sexual functioning, anxiety and stress response, peripheral vascular resistance and contractility of heart; reduces energy expenditure: high circulating levels with severe exercise.	humans) increases social contact and interaction; research is being carried out to produce a drug for epilepsy based on this.
BB46	Neurotensin	Neuropeptide	Release stimulated by fatty acids; inhibits gastro-intestinal motility and increases ileal blood flow; regulation of LH <sup>1</sup> and prolactin <sup>1</sup> ; blocks stimulation of acid and pepsin by the vagus nerve.	Low levels may be involved in schizophrenia, Alzheimer's disease, Parkinson's disease.
BB47a	Protein Tyrosine Phosphatase / PTP1B	Enzyme	Inhibits signaling of leptin and insulin <sup>1</sup> ; may explain resistance to leptin and insulin.	Likely to be important in obesity and type 2 diabetes; drug research now being carried out to find drugs to inhibit PTP1B.
BB48	Thyroxine/ Tetraiodothyronine/ T <sub>4</sub>	Hormone	Converted into T <sub>3</sub> ; growth and normal development; increase rate at which cells release energy from carbohydrates; enhance protein synthesis; stimulate nervous system.	
BB49	3,3',5'- Triiodothyronine/ Reverse T <sub>3</sub>	Hormone	Reverse T <sub>3</sub> and T <sub>3</sub> are secreted in an inverse relationship allowing the thyroid to adjust the amount of thyroid activity; blocks the action of T <sub>3</sub> by binding with the receptor sites.	Acute and chronic diseases and malnutrition also shift the T <sub>3</sub> <sup>1</sup> balance to Reverse T <sub>3</sub> .
BB50	Val-Pro- Asp-Pro- Arg	Peptide	Research on rats indicates that this is an appetite suppressant.	

## BODY BIOCHEMICAL 3 TEST KIT (25 vials)

Product Code 8006

\*\*\*Complement system: "a series of 11 chemicals always present in the blood stream. They can create a chain reaction, each one becoming activated and then activating the next member in the chain.... Each activated complement component does something to help eliminate the enemy. Some chemicals dilate blood vessels; others can destroy the membranes of bacterial cells.... Some of these attract .... [granulocytes]... into battle. These cells are extremely important, being our best eaters and destroyers of bacteria." The Body At War by John Dyer

Code	Name	Type	Location And Role	Comments
BB51	n-Acetyl-D-Glucosamine		Builds and maintains the matrix of collagen and connective tissue that forms the ground substance of cartilage.	Inflammatory bowel disease; Crohn's disease.
BB52	Anandamide	Neurotransmitter	Pain control; may be used by the brain as a central fine-tuner of electrical activity; inhibits movement; involved with mood; short term memory; male fertility (high levels slow speed of sperm); acts as a chemical messenger between the embryo and uterus during implantation of the embryo in the uterine wall; may control coughing and various respiratory functions; may increase appetite.	Also known as "the bliss molecule" (ananda is Sanskrit for bliss) and the body's own cannabis (cannabis binds to the same receptors as anandamide); chocolate contains anandamide; may be involved in Crohn's disease, Parkinson's disease, drug addiction, schizophrenia, autism and Gilles de la Tourette's syndrome.
BB53	Collagen Type I		90% of the collagen in human body; present in bone, skin (associated with type III collagen) and tendons.	In fetal and diseased tissue, type I collagen has been reported as having a different structure.
BB54	Collagen Type II		30% of hyaline and elastic cartilage is composed of type II collagen; present in inter-vertebral discs and the vitreous body of the eye.	
BB55	Collagen Type III		The major collagen found in skin, blood vessels and internal organs such as the smooth muscle layers of the gastro-intestinal tract.	
BB56	Collagen Type V		A minor collagen as it is present in less than 10% of the total collagen in any tissue; usually found with type I collagen and type III <sup>6</sup> collagen in bone, tendon, cornea, skin, blood vessels and lungs; during fetal development, basement membranes originally contain type V collagen before being replaced to type IV collagen.	
BB57	Complement C3*	Protein	Part of non-specific immune response; turned into complement 3b which enhances phagocytosis (ingestion and destruction of cell debris, microbes and other foreign matter); most abundant of complement proteins.	Low levels of C3 often seen in gram negative septicemia, shock, lupus, fungal infections and some parasitic infections such as malaria; increased complement activity seen in cancer and ulcerative colitis; decreased complement activity in hepatitis and liver cirrhosis.
BB58	Complement C5a*	Protein	Part of non-specific immune response; contributes to the development of inflammation by dilating arterioles and causing release of histamine.	Increased complement activity seen in cancer and ulcerative colitis; decreased complement activity in hepatitis and liver cirrhosis.
BB59	Complement Factor B*	Protein	Part of non-specific immune response; activates complement C3 and so the immune response.	Increased complement activity seen in cancer and ulcerative colitis; decreased complement activity in hepatitis and liver cirrhosis.
BB60	Complement	Protein	Part of non-specific immune response; activates	Increased complement activity seen in

Code	Name	Type	Location And Role	Comments
	Factor D*		complement C3 and so the immune response.	cancer and ulcerative colitis; decreased complement activity in hepatitis and liver cirrhosis.
BB61	Complement Factor I*	Protein	Part of non-specific immune response; recognizes repetitive sugar structures found in cell membranes of bacteria and viruses but not in humans; triggers reactions that activate complement C3 and C5 and so the immune response.	Increased complement activity seen in cancer and ulcerative colitis; decreased complement activity in hepatitis and liver cirrhosis.
BB62	Complement Factor P*/ Properdin	Protein	Part of non-specific immune response; activates complement C3 and so the immune response.	Increased complement activity seen in cancer and ulcerative colitis; decreased complement activity in hepatitis / cirrhosis.
BB63	Elastin	Protein	With fibrillin forms elastic fibers which are strong but can be stretched up to 150% of their relaxed length without breaking; form a network within tissues particularly skin, blood vessel walls and lung tissue.	With age thickens, fragments and acquires an affinity for calcium so may also be associated with development of atherosclerosis.
BB64	Erythropoietin/ EPO	Hormone	Produced by kidneys; formed from a plasma protein, stimulates red blood production.	Increased blood levels in anemia.
BB65	Exendin (9-39)	Peptide	Reduces glucose levels; competes for the same brain receptors as GLP1 and so blocks the effect of GLP1 and stimulates appetite.	Has been shown to acutely increase food intake and promote weight gain in long term rodent studies; influence on type 2 diabetes.
BB66	Glucagon-Like Peptide 1/ GLP1	Hormone	Produced in intestinal endocrine cells; stimulates production of insulin; inhibits production of glucagon and gastric emptying; reduces appetite; lowers blood glucose in people with diabetes.	Biological activity is arrested by Dipeptidyl Peptidase IV.
BB67	Glucosamine-6-phosphate		The form that occurs in the body; "glues" structures together; forms an integral part of cell membranes; influences cell to cell communication; important for joint surfaces, tendons, ligaments, synovial fluid, skin, bone, nails and mucus secretions of the digestive, respiratory and urinary tracts.	Important in osteoarthritis and cartilage health generally; the supplement glucosamine sulfate may be used when the body is short of this.
BB68	Glutathione Peroxidase	Enzyme	Involved in conversion of hydrogen peroxide within the body; protection against free radical damage; reduces the production of inflammatory prostaglandins and leukotrienes.	Children with asthma have significantly reduced blood levels; may be involved in schizophrenia; levels reduced if selenium deficiency.
BB69	Nociceptin/ Orphanin FQ2	Neuropeptide	Present in many areas of the CNS; believed to play a role in pain transmission; amplifies pain and enhances harmless stimuli into painful sensations.	
BB70	Nocistatin	Peptide	Counteracts the effect of nociception.	
BB71	Orexin B	Neuropeptide	Generated when blood sugar levels drop, so acting as a trigger to eat.	People who over-eat may possibly produce too much orexin; lack of orexin has been linked to narcolepsy (sleep disorder characterized by sudden sleeping).
BB72	Phosphatidyl-inositol		Important component of biological membranes; supervises division of cells and metabolism.	In some skincare products and lipsticks.
BB73	Superoxide Dismutase/ SOD	Enzyme	Antioxidant produced naturally in the body; combats the damage to cells caused by the superoxide radical.	Supplementation of SOD has been shown to exert strong regenerative effects on tissues that have become hardened or fibrotic because of age, disease, or injury; may be anti-aging.
BB74	Tumor Necrosis	Protein	Produced by macrophages, which engulf and destroy bacteria, viruses, and other foreign	Asthma, eczema, psoriasis, psoriatic arthritis, rheumatoid arthritis, AIDS,

Code	Name	Type	Location And Role	Comments
	Factor Alpha /		substances; role in regulating inflammatory and immune responses throughout the body and particularly in relation to some parasites.	multiple sclerosis, cancer; may be involved in septicemia, and the weight loss associated with parasitic infection or cancer.
BB75	Ubiquitin/ APF-1		Essential for protein degradation and cell cycling; DNA repair; cellular stress responses; various enzymes attach ubiquitin to body proteins; these enzymes are known as ubiquitin ligases.; when a protein bears many ubiquitin molecules, it is targeted for degradation by the proteasome, a huge enzyme complex; when few ubiquitins are attached, they may serve structural, regulatory, or trafficking functions.	

References:

Linda Lazarides *The Nutritional Health Bible*

Thomas A Scott & E Ian Mercer *Concise Encyclopedia Biochemistry & Molecular Biology*

William H Elliott & Daphne C Elliott *Biochemistry & Molecular Biology*

British Medical Association *The BMA Complete Family Health Encyclopedia*

Gerard Tortora and Sandra Reynolds Grabowski *Principles of Anatomy & Physiology*

William F Ganong *Review of Medical Physiology*

Lamberts Review: Glucosamine Sulfate

Various web sites, using [www.copernic.com](http://www.copernic.com) as the search engine; the web site [www.the-scientist.com](http://www.the-scientist.com) was particularly useful

## BODY BIOCHEMICAL 4 TEST KIT (25 vials)

Product Code 8007

Code	Name	Type	Location And Role	Comments
BB76	Acetyl Coenzyme A		Synthesized in the mitochondria of all cells and is used to generate ATP in the Krebs cycle; involved in the synthesis of Ach in some nerve cells.	
BB77	Actin	Protein	In order for muscle to contract myosin and actin must interact; actin-myosin interaction activates actomyosin ATPase which extracts energy from ATP for contraction.	
BB78	Adenine		One of the bases of DNA & RNA.	
BB79			Replaced with BB79a as BB79 was an unintentional duplicate of BB28.	
BB79a	Calcineurin		Speeds up the rate at which electrical signals in the brain die away, so affects long term memory.	May have a role in dementia; post-traumatic stress Syndrome and heart failure.
BB80	Calmodulin/ Modulator Protein/ CaM/ Phosphodiesterase 3':5'- Cyclic Nucleotide Activator	Protein	Calcium-binding protein found within cells; many different biochemical processes known to be regulated by calmodulin, although the interactions of calmodulin with its various target enzymes are only poorly understood; has a regulatory effect on contraction and relaxation of smooth muscles; involved in gene regulation, protein synthesis, inflammation, short term memory, the immune response, viral penetration, and the cell cycle implicating it in AIDs, Alzheimer's, certain cancers and other diseases.	
BB81	Carbonic Anhydrase	Enzyme	Present in red blood cells and kidney cells; controls the elimination of carbon dioxide from the body and the pH of urine; facilitates the transfer of carbon dioxide from the tissues to the blood and from the blood to the alveoli (air sacs) of the lungs; involved in production of gastric acid.	
BB82	Catalase	Enzyme	The decomposition of hydrogen peroxide <sup>8</sup> into water and oxygen.	
BB83	Cytosine		One of the bases of DNA & RNA.	
BB84	Dipeptidyl Peptidase IV		Arrests biological activity of GLP1 and Substance P.	
BB85	Fibrin	Protein	Insoluble; essential to blood clotting; formed from fibrinogen by the action of thrombin.	
BB86	Fibrinogen	Protein	A clotting factor in blood plasma that is converted to fibrin; produced by liver and plasma cells; approximately 7% of blood plasma proteins.	
BB87	Glycogen	Carbohydrate	The principal carbohydrate storage material in the body; plays an important role in controlling blood sugar levels.	
BB88	Glycogen Phosphorylase A	Enzyme	Involved in converting glycogen to glucose.	
BB89	Glycogen Synthase	Enzyme	Involved in converting glucose to glycogen.	
BB90	Guanine		One of the basis of DNA & RNA.	

Code	Name	Type	Location And Role	Comments
BB91	Homocysteine	Amino Acid	Formed from the breakdown of methionine; should exist only briefly before being broken down into cystathione and then cysteine; if does not happen efficiently then raised blood levels of homocysteine can occur.	Linked to atherosclerosis and Alzheimer's disease; also to homozygous homocysteine (rare condition).
BB92	Keratin	Protein	Produced in the skin epidermis; helps protect skin and underlying tissues from heat, microbes and chemicals.	
BB93	Leucine Enkephalin	Neuropeptide	Produced in the adrenal medulla; inhibits pain impulses by suppressing release of Substance P; increased secretion into the blood stream when stressed.	
BB94	Methionine Enkephalin	Neuropeptide	Produced in the adrenal medulla; sedative effect; inhibits pain impulses by suppressing release of Substance P; increased secretion into the blood stream when stressed.	In alcohol- and cocaine-preferring mouse strains, methionine enkephalin is lower in the hypothalamus; morphine stimulates enkephalin receptors.
BB95	Myosin	Protein	In order for muscle to contract, myosin and actin <sup>7</sup> must interact.	
BB96	Prothrombin/ Factor II	Body Protein	Inactive protein synthesized by the liver, released into the blood, and converted to active thrombin <sup>7</sup> in the process of blood clotting.	
BB97	Terminal Transferase	Enzyme	A DNA polymerase that does not require a primer; catalyzes the addition of nucleotides to DNA (involved in cell division).	
BB98	Thrombin	Enzyme	Active enzyme produced from prothrombin; acts to convert fibrinogen to fibrin.	
BB99	Thymine		One of the DNA bases.	
BB100	Uracil		One of the bases of RNA.	

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William F Ganong *Review of Medical Physiology*

Patricia A Lyne *Biochemistry*

## BODY BIOCHEMICAL 5 TEST KIT (25 vials)

Product Code 8008

### Prostaglandins

Michael W. Davidson of the Florida State University: "Prostaglandins act in a manner similar to that of hormones, by stimulating target cells into action. However, they differ from hormones in that they act locally, near their site of synthesis, and they are metabolized very rapidly. Another unusual feature is that the same prostaglandins act differently in different tissues."

### Glycolysis

A series of chemical reactions in the cytosol of the cell in which a molecule of glucose is split into two molecules of pyruvic acid<sup>2</sup> and two ATP's molecules (the energy currency of living cells, storing and transferring energy produced in metabolic processes)

Code	Name	Type	Location And Role	Comments
BB101	Aldolase	Enzyme	Involved in 4 <sup>th</sup> step in process of glycolysis.	
BB102	CART/ Cocaine- And Amphetamine Related Transcript	Neuropeptide	Modulates the action of leptin and neuropeptide Y and so reduces appetite; cocaine and amphetamines stimulate its production.	
BB103	Elastase	Digestive Enzyme	Pancreas, activated from proelastase by trypsin; turns peptides into proteins.	
BB104	Enolase	Enzyme	Involved in 9 <sup>th</sup> step in process of glycolysis.	
BB105	Galanin	Neuropeptide	Inhibits release of acetylcholine and glutamic acid; decreases excitability of spinal neurons; stimulates the appetite.	May be involved in Alzheimer's disease.
BB106	Ghrelin	Hormone	Increases appetite; may be a hormonal link between stomach, hypothalamus and pituitary and so regulate energy balance; regulates growth hormone secretions; may signal to the hypothalamus when an increase in metabolic efficiency is necessary.	Blood levels are elevated in anorexics and return to normal after partial weight recovery.
BB107	Glyceraldehyde-3- Phosphate Dehydrogenase	Enzyme	Involved in 6 <sup>th</sup> step in process of glycolysis.	
BB108	Hexocinase	Enzyme	Involved in 1 <sup>st</sup> step in process of glycolysis.	
BB109	Melatonin	Hormone	Secreted by pineal gland; may inhibit reproductive activities and promote sleep; regulation of body's biological clock.	
BB110	Neuromedin B	Neuropeptide	Present in the central nervous system and gastro-intestinal tract; binds to corticotropin releasing factor receptors; involved in smooth muscle contraction, blood pressure, blood glucose, body temperature and cell growth; suppresses the appetite.	

Code	Name	Type	Location And Role	Comments
BB111	2-Phenylethylamine/ Pea/ B-Phenethylamine	Neuro-Hormone	Chemical which plays a critical role in the limbic system known to give a feeling of bliss.	60% of depressed patients have a PEA deficit; a natural ingredient in chocolate; MAOI anti-depressants increase concentrations of this in the brain.
BB112	Phosphoglucose Isomerase	Enzyme	Involved in 2nd step in process of glycolysis.	
BB113	Phospho-Fructokinase	Enzyme	Involved in 3rd step in process of glycolysis.	
BB114	Prostaglandin A1/ PGA1		Relaxes the muscles in the walls of blood vessels, acting as powerful vasodilators and so lowering blood pressure.	May protect against peptic ulcers.
BB115	Prostaglandin D2/ PGD2		Stimulates inflammation.	
BB116	Prostaglandin E1/ PGE1		Dilates blood vessels and so reduces blood pressure.	Seems to be elevated in manic-depressive disorders; used as a treatment for erectile dysfunction in men.
BB117	Prostaglandin E2/ PGE2		Promotes platelet adhesiveness; promotes sodium retention; promotes inflammation; widens airways; stimulates contraction of uterus; protects against peptic ulcers; acts on adenylate cyclase to enhance the production of cyclic AMP.	Used as a treatment for erectile dysfunction in men.
BB118	Prostaglandin F2/ PGF2		Stimulates contraction of uterus; narrows airways.	
BB119	Prostaglandin I2/ PGI2		Reduces platelet stickiness.	Women who develop pre-eclampsia have low levels of this.
BB120	Purine		Used in the process producing proteins; converts the energy produced by the oxidation of food molecules to a form which the cell can use to satisfy its energy needs; involved in nerve conduction and muscle contraction; rids cells of excess nitrogen; protects the cell from cancer-causing agents.	Increased levels raise the levels of uric acid in the blood and cause gout.
BB121	Pyruvate Kinase	Enzyme	Involved in 10 <sup>th</sup> step in process of glycolysis.	
BB122	Serine	Amino Acid	Can be made in human body from glycine; used to make substances such as choline, phospholids, phosphotidylserine; present in all cell membranes; plays a key role in membrane stability.	
BB123	Triosephosphate Isomerase	Enzyme	Involved in 5 <sup>th</sup> step in process of glycolysis.	
BB124	Uric Acid		Waste product of the breakdown of nucleic acid in cells; formed primarily in the liver and excreted by the kidney into the urine.	Over-production leads to uric acid crystal deposits in the joints (gout); low levels in people with multiple sclerosis.
BB125	Urocortin	Neuropeptide	Inhibits appetite.	

Linda Lazarides The Nutritional Health Bible  
British Medical Association *The BMA Complete Family Health Encyclopedia*  
Gerard Tortora and Sandra Reynolds Grabowski *Principles of Anatomy & Physiology*

## BODY BIOCHEMICAL 6 TEST KIT (25 Vials)

Product Code 8082

Code	Name	Comments
BB 126	Amphiregulin/AREG	A member of the epidermal growth factor family. Interacts with the EGF/TGF-alpha receptor to promote the growth of normal epithelial cells and inhibits the growth of certain aggressive carcinoma cell lines.
BB 127	Androstenedione	A steroid hormone produced in the adrenal glands and the gonads as an intermediate step in the biochemical pathway that produces the testosterone, estrone and estradiol.
BB 128	Dehydroepiandrosterone / DHEA	A steroid hormone; the most abundant circulating steroid in humans, in whom it is produced in the adrenal glands, the gonads, and the brain, where it functions predominantly as a metabolic intermediate in the biosynthesis of the androgen and oestrogen sex steroids.
BB 129	Epidermal Growth Factor	Stimulates cell growth, proliferation, and differentiation. Can be found in platelets, macrophages, urine, saliva, human milk, and plasma.
BB 130	Fibroblast Growth Factor 1 /FGF-1	Growth factors involved in angiogenesis, wound healing, and embryonic development; promotes endothelial cell proliferation and the physical organization of endothelial cells into tube-like structures; stimulates angiogenesis and the proliferation of fibroblasts that give rise to granulation tissue, which fills up a wound space/cavity early in the wound healing process. Seems to be involved in the regulation of synaptic plasticity and processes attributed to learning and memory, at least in the hippocampus.
BB 131	Fibroblast Growth Factor 2 / FGF-2	Growth factors involved in angiogenesis, wound healing, and embryonic development. Promotes endothelial cell proliferation and the physical organization of endothelial cells into tube-like structures. Stimulate angiogenesis and the proliferation of fibroblasts that give rise to granulation tissue, which fills up a wound space/cavity early in the wound healing process. Adult neurogenesis within the hippocampus depends greatly on FGF-2. Seems to be involved in the regulation of synaptic plasticity and processes attributed to learning and memory, at least in the hippocampus.
BB 132	Fibroblast Growth Factor 10 / FGF-10	Growth factors involved in angiogenesis, wound healing, and embryonic development.
BB 133	Fibroblast Growth Factor 23 / FGF-23	Main function seems to be regulation of phosphate concentration in plasma. Secreted by osteoblasts and osteoclasts in response to elevated calcitriol. Acts on kidneys, where it decreases the expression of NPT2, a sodium-phosphate cotransporter in the proximal tubule, so decreases the re-absorption and increases excretion of phosphate.
BB 134	Gastrin	A peptide hormone that stimulates secretion of gastric acid (HCl) by the parietal cells of the stomach and aids in gastric motility.
BB 135	Granulocyte Colony-Stimulating Factor / G-CSF	A glycoprotein, growth factor and cytokine produced by a number of different tissues to stimulate the bone marrow to produce granulocytes and stem cells, and then stimulates the bone marrow to release them into the blood. Also stimulates the survival, proliferation, differentiation, and function of neutrophil precursors and mature neutrophils.
BB 136	Granulocyte Macrophage Colony-Stimulating Factor / GM-CSF	A protein secreted by macrophages, T cells, mast cells, NK cells, endothelial cells and fibroblasts. Functions as a white blood cell growth factor. Stimulates stem cells to produce granulocytes (neutrophils, eosinophils, and basophils) and monocytes.

Code	Name	Comments
BB 137	Growth Hormone Releasing Hormone / Growth Hormone-Releasing Factor /GRF/ GHRF / Somatoliberin / Somatocrinin	Stimulates growth hormone secretion; (growth hormone is required for normal postnatal growth, bone growth, regulatory effects on protein, carbohydrate, and lipid metabolism); promotes slow-wave sleep.
BB 138	Insulin-Like Growth Factor 1 / IGF-1/ Somatomedin C	A hormone similar in molecular structure to insulin; plays an important role in childhood growth and continues to have anabolic effects in adults.
BB 139	Insulin-Like Growth Factor 2/ IGF 2	A hormone similar in molecular structure to insulin; has growth-regulating, insulin-like and mitogenic activities; believed to be a major fetal growth factor.
BB 140	Interferon Gamma	Critical for innate and adaptive immunity against viral and intracellular bacterial infections and for tumor control. An important activator of macrophages. Aberrant IFN- $\gamma$ expression is associated with a number of autoinflammatory and auto-immune diseases.
BB 141	Lipopolysaccharide / LPS	Found in the outer membrane of Gram negative bacteria, act as endotoxins and elicit strong immune responses. Produced by gut bacteria, so source of many inflammatory reactions including autoimmunity.
BB 142	Neuregulin 1 / NRG1	Induce the growth and differentiation of epithelial, neuronal, glial, and other types of cells. Essential for the normal development of the nervous system and the heart. Thought to play a role in schizophrenia. Part of the EGF family of proteins.
BB 143	Neuregulin 2 / NRG2	Induces the growth and differentiation of epithelial, neuronal, glial, and other types of cells. Part of the EGF family of proteins.
BB 144	Neuregulin 3 / NRG3	Linked to a susceptibility to schizophrenia and Hirschsprung's disease.Part of the EGF family of proteins.
BB 145	Neuregulin 4 / NRG4	Activates type-1 growth factor receptors to initiate cell to cell signaling through tyrosine phosphorylation. Loss of expression of NRG4 is frequently seen in advanced bladder cancer while increased NRG4 expression correlates to better survival.
BB 146	Peptide YY / PYY / Peptide Tyrosine Tyrosine	Released by cells in the ileum and colon in response to eating; appears to reduce appetite (by slowing the gastric emptying); inhibits gastric motility and increases water and electrolyte absorption in the colon; increases efficiency of digestion and nutrient absorption after a meal; may also suppress pancreatic secretion.
BB 147	Platelet-Derived Growth Factor / PDGF-R	Plays a significant role in blood vessel formation (angiogenesis), the growth of blood vessels from already-existing blood vessel tissue. Uncontrolled angiogenesis is a characteristic of cancer.
BB 148	Pregnenolone	A steroid the body makes as a precursor to other steroid hormones, such as progesterone, DHEA, mineralocorticoids (which regulate electrolyte balance), corticosteroids (which influence inflammation and metabolism), estrogens, and androgens.
BB 149	Transforming Growth Factor Alpha / TGF-Alpha	Seems to play a role in mediation of cell-cell adhesion and in juxtacrine stimulation of adjacent cells. Expression of TGF-alpha is widespread in tumors and transformed cells. TGF-alpha is also expressed in normal tissues during embryogenesis and in adult tissues, including pituitary, brain, keratinocytes and macrophages.
BB 150	Transforming Growth Factor-Beta / TGF-Beta	A protein that controls proliferation, cellular differentiation, and other functions in most cells. A type of cytokine which plays a role in immunity, cancer, bronchial asthma, heart disease, diabetes, Marfan syndrome, Loews-Dietz syndrome, Parkinson's disease and AIDS.

## BODY BIOCHEMICAL 7 TEST KIT (25 Vials)

Product Code 8108

Code	Name	Comments
BB 151	Alanine	A non-essential amino acid, high levels linked to high blood pressure. Alterations in the alanine cycle that increase the levels of serum alanine aminotransferase (ALT) is linked to the development of type II diabetes. Good sources in the diet include beans, nuts, seeds, soy, whey, brewer's yeast, brown rice, bran, corn, legumes, whole grains.
BB 152	Amyloid Beta Peptide / Beta Amyloid	The main component of amyloid plaques (extracellular deposits found in the brains of patients with Alzheimer's disease); similar plaques appear in some variants of Lewy body dementia and in inclusion body myositis (a muscle disease); also form the aggregates that coat cerebral blood vessels in cerebral amyloid angiopathy.
BB 153	ATP / Adenosine Triphosphate	Transports chemical energy within cells for metabolism; one of the end products of photophosphorylation, cellular respiration, and fermentation and used by enzymes and structural proteins in many cellular processes, including biosynthetic reactions, motility, and cell division.
BB 154	Catechol-O-Methyl-Transferase/COMT	One of several enzymes that inactivate dopamine, epinephrine, and norepinephrine. Also shortens the biological half-lives of certain neuro-active drugs, like L-DOPA, alpha-methyl DOPA and isoproterenol.
BB 155	Glutathione Reductase	Plays an important role in protecting hemoglobin, red cell enzymes, and biological cell membranes against oxidative damage by increasing the level of reduced glutathione (GSSGR) in the process of aerobic glycolysis; can act as a scavenger for hydroxyl radicals, singlet oxygen, and various electrophiles.
BB 156	Hydrogen Peroxide	Trace quantities released from immune cells (e.g. neutrophils and monocytes) as they come into contact with different bacteria or fungi.
BB 157	Intrinsic Factor Gastric Intrinsic Factor / GIF	Produced by the parietal cells of the stomach; necessary for the absorption of vitamin B12 (cobalamin) later on in the small intestine.
BB 158	L-Dopa	Made and used as part of the normal biology; the precursor to the neurotransmitters dopamine, norepinephrine and epinephrine. As a drug it is used in the clinical treatment of Parkinson's disease and dopamine-responsive dystonia.
BB 159	Lipoprotein High-Density / HDL	Enable the transportation of lipids, such as cholesterol and triglycerides, within the water around cells, including the bloodstream. Remove fats, including cholesterol, from cells, including within artery wall atheroma and transport it back to the liver for excretion or re-utilization. Often informally called good cholesterol.
BB 160	Lipoprotein Lipase	Enzyme produced by many tissues, including adipose tissue, cardiac and skeletal muscle, islets, and macrophages; hydrolyses triglycerides in lipoproteins, such as those found in chylomicrons and very low-density lipoproteins (VLDL), into two free fatty acids and one monoacylglycerol molecule; also involved in promoting the cellular uptake of chylomicron remnants, cholesterol-rich lipoproteins, and free fatty acids; contributes in a pronounced way to normal lipoprotein metabolism and many aspects of metabolism, including energy balance, insulin action, body weight regulation, and atherosclerosis.
BB 161	Lipoprotein Low-Density / LDL	Enable transport of multiple different fat molecules, as well as cholesterol, within the water around cells and within the water-based bloodstream. Transport cholesterol into the artery wall, retained there by arterial proteoglycans and attract macrophages that engulf the LDL particles and start the formation of plaques; increased levels are associated with atherosclerosis. Often informally called bad cholesterol.
BB 162	Lipoprotein Very Low-Density / VLDL	Made by the liver; enable fats and cholesterol to move within the water-based solution of the bloodstream. VLDL is assembled in the liver from triglycerides, cholesterol, and apolipoproteins. VLDL is converted in the bloodstream to low-density lipoprotein.

Code	Name	Comments
BB 163	Motilin	Hormone produced from endocrine cells of the duodenal mucosa to help regulate motility of the digestive tract. Called "housekeeper of the gut" because it improves peristalsis in the small intestine and clears out the gut to prepare for the next meal.
BB 164	Nicotinamide Adenine Dinucleotide / NAD	The coenzyme form of the vitamin niacin; found in all living cells; has a crucial roles in many cellular processes, both as a coenzyme for redox reactions and as a substrate to donate ADP-ribose units; involved in age-associated diseases, including diabetes, cancer and neurodegenerative diseases.
BB 165	Nitric Oxide	Serves as a neurotransmitter between nerve cells, part of its general role in redox signalling (helping cells protect themselves, detect damage and then either repair or replace damaged cells). Also of critical importance as a mediator of vasodilation in blood vessels, so playing a key role in renal control of extracellular fluid homeostasis, the regulation of blood flow and blood pressure, and in erection of the penis.
BB 166	Pancreatic Polypeptide	Secreted by the pancreas to regulate pancreatic secretion activities (endocrine and exocrine); also has effects on hepatic glycogen levels and gastro-intestinal secretions; secretion is stimulated by eating, exercising, and fasting; can inhibit gallbladder contraction; elevated in anorexia nervosa and reduced in conditions associated with increased food intake.
BB 167	Peroxynitrite / Peroxonitrite	Produced in the body in inflammation, cardiovascular disease, neurodegeneration, diabetes, and other pathologies.
BB 168	Plasmin	Enzyme present in blood that degrades many blood plasma proteins, most notably, fibrin clots; activates collagenases, some mediators of the complement system and weakens the wall of the Graafian follicle (leading to ovulation).
BB 169	Plasminogen	The inactive enzyme precursor of plasmin.
BB 170	Proline	A non-essential amino acid; involved in tissue repair, collagen formation, arteriosclerosis prevention and blood pressure maintenance.
BB 171	Quinolinic Acid /2,3-Pyridinedicarboxylic Acid	A downstream product of the kynurenine pathway which metabolizes the amino acid tryptophan; implicated in mood disorders, schizophrenia, conditions related to neuronal death, amyotrophic lateral sclerosis, Alzheimer's disease, brain ischemia, HIV associated neurocognitive disorder, Huntington's disease, Parkinson's disease and Lyme disease with CNS involvement.
BB 172	Thrombopoietin / Megakaryocyte Growth And Development Factor	A glycoprotein hormone produced by the liver and kidney which regulates the production of platelets; stimulates the production and differentiation of megakaryocytes, the bone marrow cells that bud off large numbers of platelets.
BB 173	Tissue Plasminogen Activator	A protein involved in the breakdown of blood clots; as an enzyme, it catalyzes the conversion of plasminogen to plasmin. Used in clinical medicine to treat only embolic or thrombotic stroke. Use is contra-indicated in hemorrhagic stroke and head trauma.
BB 174	Triglycerides	A blood lipid that help enable the bidirectional transference of adipose fat and blood glucose from the liver. High levels of triglycerides in the bloodstream have been linked to atherosclerosis and, by extension, the risk of heart disease and stroke.
BB 175	Vasoactive Intestinal Peptide	Produced in many tissues including the gut, pancreas, and suprachiasmatic nuclei of the hypothalamus in the brain; stimulates contractility in the heart, causes vasodilation, increases breakdown of glucose, lowers arterial blood pressure and relaxes the smooth muscle of trachea, stomach and gall bladder.

## BODY BIOCHEMICAL 8 TEST KIT (25 Vials)

Product Code 8139

Citric Acid Cycle is also known as the TCA cycle (tricarboxylic acid cycle) or the Krebs cycle.

It is a series of chemical reactions used by all aerobic organisms to release stored energy through the oxidation of acetyl-CoA derived from carbohydrates, fats, and proteins, into adenosine triphosphate (ATP) and carbon dioxide. In addition, the cycle provides precursors of certain amino acids, as well as the reducing agent NADH, that are used in numerous other reactions. Its central importance to many biochemical pathways suggests that it was one of the earliest established components of cellular metabolism and may have originated abiogenically. Even though it is branded as a 'cycle', it is not necessary for metabolites to follow only one specific route; at least three segments of the citric acid cycle have been recognised. (Wikipedia)

Code	Name	Description
BB 176	Aconitase	An essential enzyme in the citric acid cycle and iron regulatory protein 1 interacts with messenger RNA to control the levels of iron inside cells.
BB 177	Alkaline Phosphatase / ALP	Present in all tissues throughout the entire body, but is particularly concentrated in liver, bile duct, kidney, bone, and the placenta; high levels can occur if the bile ducts are obstructed, in Paget's Disease of bone and in untreated coeliac disease.
BB 178	Alpha-Ketoglutarate Dehydrogenase	Part of citric acid cycle; catalyzes the conversion of $\alpha$ -ketoglutarate to succinyl-CoA and produces NADH directly providing electrons for the respiratory chain.
BB 179	Alpha-Ketoglutaric Acid (AKA)	A key intermediate in the citric acid cycle, coming after isocitrate and before succinyl CoA.
BB 180	Asparagine	An amino acid required for development and function of the brain; also plays an important role in the synthesis of ammonia.
BB 181	Cis-Aconitic Acid	An intermediate in the isomerisation of citrate to isocitrate in the citric acid cycle.
BB 182	Citrate Synthase	An enzyme active in all cells, where it is most often responsible for catalyzing the first reaction of the citric acid cycle (the condensation of acetyl-CoA and oxaloacetate to form citrate).
BB 183	Creatinine	A waste product that comes from the normal wear and tear on muscles of the body.
BB 184	Dihydrotestosterone / DHT / Androstanoone / Stanolone	Involved in sexual differentiation of the male genitalia during embryogenesis, maturation of the penis and scrotum at puberty, growth of facial, body, and pubic hair, and development and maintenance of the prostate gland and seminal vesicles. It is produced from testosterone, a less potent hormone, by the enzyme 5 $\alpha$ -reductase in select tissues.
CIBB 185	Fumarase / Fumarate Hydratase	Participates in two metabolic pathways (citric acid cycle and reductive citric acid cycle); is also important in renal cell carcinoma.
BB 186	Human Chorionic Gonadotropin / hCG	A hormone produced by the placenta after implantation; its presence of hCG is detected in some pregnancy tests (HCG pregnancy strip tests); also produced by some cancer tumors.
BB 187	Isocitrate	Involved in citric acid cycle.
BB 188	Isocitrate Dehydrogenase	Involved in the citric acid cycle; responsible for catalyzing the reversible conversion of isocitrate to alpha-ketoglutarate and CO <sub>2</sub> in a two-step reaction.
BB 189	Lipotropin	Hormone secreted by the anterior pituitary gland which promotes the release of fat reserves from the liver into the bloodstream.
BB 190	Malate Dehydrogenase	An enzyme in the citric acid cycle that catalyzes the conversion of malate into oxaloacetate (using NAD <sup>+</sup> ) and vice versa.
BB 191	NADH / Nicotinamide Adenine Dinucleotide	Involved in citric acid cycle; a co-enzyme required for the production of energy in cells. Its effects include the stimulation of dopamine, noradrenaline, and serotonin receptors, by

Code	Name	Description
		which mechanism it is thought to increase mental alertness and clarity and improve concentration.
BB 192	Nagalase / $\alpha$ -N-acetylgalactosaminidase	An extracellular matrix-degrading enzyme that is secreted by cancerous cells in the process of tumor invasion. It is also an intrinsic component of the envelope protein of various virions, such as HIV and the influenza virus. Thus, it is also secreted from virus-infected cells.
BB 193	Oxaloacetate / Oxalacetic Acid	A metabolic intermediate in many processes that occur in the body, including gluconeogenesis, urea cycle, glyoxylate cycle, amino acid synthesis, fatty acid synthesis and citric acid cycle.
BB 194	Phenylalanine Hydroxylase	An enzyme that catalyzes the hydroxylation of the aromatic side-chain of phenylalanine to generate tyrosine.
BB 195	Proglucagon	A precursor of glucagon, and several other components; generated in the alpha cells of the pancreas and in the intestinal L cells in the distal ileum and colon.
BB 196	Proinsulin	The prohormone precursor to insulin made in the beta cells of the islets of Langerhans, specialized regions of the pancreas: There are higher concentrations of proinsulin after meals and lower levels when a person is fasting. Increased levels of proinsulin in the circulatory system relative to mature insulin concentrations can indicate impending insulin resistance and the development of type 2 diabetes.
BB 197	Selenocysteine	Amino acid present in several enzymes (for example glutathione peroxidases, tetraiodothyronine 5' deiodinases, thioredoxin reductases, formate dehydrogenases, glycine reductases, and some hydrogenases).
BB 198	Succinate	Part of citric acid cycle; also used as a supplement for symptoms related to menopause such as hot flushes and irritability.
BB 199	Succinyl-Coenzyme A Synthetase / Succinyl-CoA synthetase / Succinate Thiokinase / Succinate-CoA Ligase	The only enzyme in the citric acid cycle that catalyzes a reaction in which a nucleoside triphosphate (GTP or ATP) is formed by substrate-level phosphorylation. Defective SCS has been implemented as a cause of Fatal Infantile Lactic Acidosis.
BB 200	Tetrahydrobiopterin	Used in the degradation of phenylalanine and in the biosynthesis of some neurotransmitters (serotonin, melatonin, dopamine, norepinephrine, epinephrine); also a cofactor for the production of nitric oxide (NO) by the nitric oxide synthases.

**HORMONE TEST KIT (30 vials)**  
**Product Code 8032**

There are other hormones are in the Body Biochemical Test Kits.

Code	Name	Secreting Gland	Comment
H1	Adrenocorticotropic (ACTH)	Pituitary	Stimulates adrenal cortex to secrete other hormones.
H2	Aldosterone	Adrenal Cortex	Increases re-absorption of sodium from urine and stimulates excretion of potassium.
H3	Androgen		A group of hormones that contribute to development of male reproductive system, e.g. testosterone.
H4	Antidiuretic Hormone /ADH/ Vasopressin	Hypothalamus	Affects urine volume, stored in posterior pituitary.
H5	Calcitonin / CT	Thyroid	Homeostasis of blood calcium and phosphate levels.
H6	Cholecystokinin / CCK	Duodenum	Inhibits secretion of gastric juice, decreases movement of GI tract, stimulates secretion of pancreatic juice rich in digestive enzymes, causes ejection of bile from gall bladder and opening of sphincters at common duct, and induces a feeling of satiety; may regulate feeding as a "stop eating" signal.
H7	Corticosterone	Adrenal Cortex	Converted to aldosterone by aldosterone synthase.
H8	Corticotropin Releasing Hormone / CRH	Hypothalamus	Stimulates release of ACTH involved in the regulation of food intake, energy homeostasis and stress response.
H9	Cortisone/Cortisol	Adrenal Cortex	Breaks down muscle. See also glucocorticoids.
H10	Epinephrine/Adrenaline	Adrenal Medulla	Helps body resist stress by increasing heart rate, constricting blood vessels, accelerating respiration, decreasing digestion, increasing efficiency of muscular contractions, increasing blood sugar, stimulating cellular metabolism.
H11	Follicle-Stimulating Hormone (FSH)	Pituitary	Stimulates production of eggs and sperm.
H12	Glucocorticoids	Adrenal Cortex	Resistance to stress. 3 of them: cortisol, corticosterone, and cortisone. Makes sure enough energy is available; conversion of non-carbohydrates into energy; makes blood vessels more sensitive to vessel-constricting chemicals, anti-inflammatory.
H13	Growth Hormone Inhibiting Hormone (GHIH) / Somatostatin	Hypothalamus, Pancreas, Intestinal Tract And Regions Of The Central Nervous System Outside The Hypothalamus	Inhibits secretion of acid and pepsin and release of gastrin, insulin and glucagons; inhibits motility of the gall bladder and intestine; suppresses secretion of lipase by the pancreas; slows absorption of nutrients from the gastro-intestinal tract.
H14	Insulin	Pancreas	Decreases blood sugar levels; prevents muscle from being broken down.
H15	Luteinizing Hormone	Pituitary	Stimulates sexual reproduction activities.
H16	Melanocyte-stimulating Hormone (MSH)	Pituitary	Increases skin pigmentation. Inhibits fever and peripheral inflammation. Suppresses appetite.
H17	Norepinephrine/Noradrenaline (NE)	Adrenal Medulla	As epinephrine.
H18	Oestrogen	Ovaries	Develops and maintains female reproductive structures, especially endometrial lining of uterus, and secondary sex characteristics, including the breasts. Contributes to fluid and electrolyte balance. Important for bone density in both women and men. (See

Code	Name	Secreting Gland	Comment
			also Body Bio 2 test kit.)
H19	Oxytocin (OT)	Hypothalamus	Contraction of uterus and mammary glands, breast feeding, orgasm, autonomic control of emotions. Stored in posterior pituitary. Lowers steroid synthesis in testes.
H20	Parathyroid Hormone (PTH)	Parathyroid	Helps to control homeostasis of calcium and phosphates in the blood.
H21	Progesterone (PROG)	Ovaries	Essential for the function of the female reproductive system; produced in the ovaries during the second half of the menstrual cycle, and also by the placenta during pregnancy; production declines during the menopause. Helps prepare endometrium for implantation of fertilized ovum and mammary glands for milk secretion. Can inhibit GnRH & PRL.
H22	Prolactin (PRL)	Pituitary	Initiates milk production by mammary glands. Excess prolactin can lead to absence of ovulation, lack of periods, excessive or spontaneous secretion of milk in women, and decreased sex drive, decreased sperm production and impotence in men. Women who cannot conceive often have high levels of prolactin. Enhances dopamine secretion. May be involved in the immune system.
H23	Relaxin (RLX)	Ovaries And Placenta	Relaxes symphysis pubis & dilates cervix towards end of pregnancy.
H24	Secretin	Intestinal Mucosa	Inhibits secretion of gastric juices, decreases movement of GI tract, stimulates secretion of pancreatic juice rich in sodium bicarbonate ions, and stimulates secretion of bile by hepatic cells of liver.
H25	Testosterone	Testes in men, ovaries in women. Small amounts are also secreted by the adrenal glands.	Produces male characteristics. Builds up muscles in males and females. In females oestrogen is made from testosterone.
H26	Thymosin	Thymus	Maturation of T lymphocytes.
H27	Thyroid-stimulating Hormone (TSH)	Pituitary	Stimulates thyroid gland to produce its hormones.
H28	Thyrotropin Releasing Hormone (TRH)	Hypothalamus	Stimulates anterior pituitary to secrete TSH.
H29	Triiodothyronine/ T3	Thyroid	Regulates metabolism by stimulating carbohydrate and fat breakdown, growth and development, and regulate activity of nervous system resulting in increased and more forceful heartbeat, increased motility of GI tract, increased nervousness.
H30	Human Growth Hormone/Somatotropin	Anterior Pituitary	Increases the growth rate of the skeleton and skeletal muscles in children and teenagers. In adults helps to maintain muscle and bone mass and promote healing of injuries and tissue repair; speeds up the breakdown of liver glycogen into glucose; excess production may cause diabetes mellitus.

