

# Glossary

## A

- $\alpha$ -amylase** Enzymes which hydrolyse starch,  $\alpha$ -amylases found in animals,  $\beta$ -amylases found in plants.
- $\alpha$ -fucosidase** Enzyme which metabolises fucose, a mucopolysaccharide present in blood group substances and human milk.
- $\alpha$ -galactosidase** Enzyme which catalyses the metabolism of galactosides.
- Acetazolamide** Carbonic anhydrase inhibitor. Used as an anti-epileptic and to treat glaucoma. Has antidiuretic properties.
- Acetaminophen** Also known as Paracetamol.
- Acetylsalicylic acid** Also known as Aspirin. Achalasia Failure of muscles to react. Often refers to discordant oesophageal peristalsis leading to swallowing disorders.
- Achlorhydria** Absence of hydrochloric acid in the lumen of the stomach.
- Acid phosphatase** One of a group of enzymes which catalyse the hydrolysis of phosphoric acid esters. Acid phosphatase has an optimum pH of between 4.0 and 5.4. Present in kidney, serum, semen and prostate gland. It is associated with resorption of bone and teeth.
- Acute myeloid leukaemia** Malignant disease of leucopoietic tissue i.e. tissue which produces white blood cells.
- Adrenocorticosteroids.** A group of hormones secreted by the adrenal cortex. See also steroids.
- Aerosol** A dispersion of solid or liquid particles in a gas stream.
- Air embolism** A bubble or bolus of gas in the bloodstream. A sufficiently large embolism can be fatal.
- Albumin** One of the major serum proteins.
- Albuterol** See salbutamol.
- Aldehyde dehydrogenase** This enzyme catalyses the conversion of primary aldehydes to the corresponding carboxylic acid.
- Aldolase** Enzyme present in skeletal and heart muscle and liver. Converts glycogen to lactic acid.
- Aldosterone** Mineralocorticoid hormone secreted by the adrenal cortex. Regulates metabolism of sodium, chloride and potassium.
- Alizapride** A prokinetic agent. Synchronises and accelerates disturbed motility of the gut.
- Alkaline phosphatase** Phosphatase with an optimum pH of 9. Its function is in the mineralization of bone.
- Alkaline tide** Occurrence of alkaline urine during gastric digestion.
- Alkanes** Any saturated aliphatic hydrocarbon with the general formula  $C_nH_{2n+2}$ . Also called paraffins.
- Alveolar-capillary membrane** The one cell thick membrane through which gaseous exchange occurs in the lung.
- Alzheimers disease** A chronic, organic mental disorder characterised by presenile dementia.
- Amberlite resin** Trade name for a series of polyelectrolyte ion-exchange resins widely used for chromatography.
- Amenorrhoea** Absence or suppression of menstruation.
- Aminophylline** A mixture of theophylline and ethylenediamine used in acute asthma.
- Aminosalicyclic acid** An anti-tuberculosis drug.
- Amityriptiline** An antidepressant drug.
- Amoxycillin** A semi-synthetic penicillin.
- Amylase** A class of enzymes that split or hydrolyse starch.
- Amylopectin** The insoluble component of starch.
- Amylose** A groups of carbohydrates that includes starch cellulose and dextrin.
- Anaerobes** Able to live without oxygen.
- Anaesthetics** Drugs which reduce or eliminate certain sensory functions.
- Angina pectoris** Severe pain and a sensation of constriction of the heart. Caused by deficiency of oxygen to heart muscle.
- Angiotensin** A vasopressin substance produced when renin is released from the kidney.
- Anorexia nervosa** Psychiatric disorder with a fear of becoming obese. Weight loss may be extreme.
- Anthracene** An aromatic molecule consisting of 3 fused benzene rings. It is strongly carcinogenic.
- Anthraquinones** A class of laxative agents.
- Anti-reflux agents** Agents which react with gastric acid to form a floating foam on the gastric contents. These suppress gastro-oesophageal reflux.
- Antibiotics** A variety of natural and synthetic substances which destroy microorganisms.
- Anticonvulsants** An agent which prevents or relieves convulsions.
- Antiemetics** Agent which relieves or prevents nausea and vomiting.
- Antigens** A protein marker on the surface of a cell which identifies type of cell and whether it is "self" or "non-self".
- Antihistamines** Agents which oppose the effect of histamine.
- Antihypertensives** Agents which control or reduce high blood pressure.
- Antimicrobials** Destructive to or preventing the development of microorganisms.

**Antipyrine** An analgesic and antipyretic drug.

**Antisense oligonucleotide** An oligonucleotide complementary to a specific gene sequence which binds to mRNA and prevents transcription.

**Antivirals** Opposing the actions of a virus.

**Appendices epiploicae** Pouches of peritoneum. Filled with fat and attached to the colon.

**Appendix** A short blind pouch arising near the junction of the small and large intestines.

**Aqueous humor** Transparent liquid contained in the anterior and posterior chambers of the eye.

**Arachidonic acid** An essential fatty acid formed from unsaturated acids of plants. It is a precursor of prostaglandins.

**Arachis oil** Ground-nut or peanut oil. Used as a faecal softener.

**Areolar** relating to the areola, which is a small space or cavity in tissue. Areolar tissue—loose connective tissue which occupies the interspaces of the body.

**Aspirin** Acetylsalicylic acid. A derivative of salicylic acid. A widely used analgesic and anti-pyretic.

**Asthma** Disease which causes increased responses of the tracheobronchial tree to various substances. The result is constriction of the airways.

**Atopy** Genetic predisposition to hypersensitivity or allergic reaction. Hayfever and asthma are common inherited allergies.

**Atropine** Alkaloid obtained from *bella donna*. It is a parasympathetic agent.

**Auerbach plexus** A plexus of sympathetic nerve fibres located between the circular and longitudinal layers of the stomach and small intestine.

**Azelastine** Topical preparations of an antihistamine used to treat seasonal allergic conjunctivitis.

## B

**$\beta$ -blockers** Also known as  $\beta$ -adrenoceptor blocking drugs. Agents which act on sympathetic nerves to block the action of adrenaline and noradrenaline.

**$\beta$ -cyclodextrins** see Cyclodextrins.

**$\beta$ -glucosidase** An enzyme that catalyses the hydrolysis of a glucoside.

**$\beta$ -glucuronidase** An enzyme that splits glycosidic linkages in glucuronides.

**B cells** Lymphoid stem cells from the bone marrow which migrate to and become antigen specific cells in the spleen and lymph nodes.

**B lymphocytes** Cells which identify foreign antigens and can differentiate into antibody producing plasma cells or memory cells.

**Bacteroid** Resembling bacteria.

**Bartholin's glands** A small compound mucous gland situated one in each lateral wall of the vestibule of the vagina.

**Basal lamina** Bottom most layers of cells of a membrane. Gives structural integrity.

**Basement membrane** See Basal lamina.

**Bauhin's valve** Ileocaecal valve.

**Beclomethasone** A corticosteroid drug.

**Benzalkonium chloride** An antibacterial preservative.

**Benzocaine** A local anaesthetic used topically.

**Benzoic acid** Compound used in keratolytic ointments.

**Betaxolol** A  $\beta$ -blocking drug.

**Bethanechol** Cholinergic drug used to treat paralytic ileus and urinary retention not caused by organic disease.

**Bidomide** A sodium channel blocker used as a cardiovascular anti-arrhythmic.

**Bifidobacterium** A soil-borne bacterium commonly colonizing the gastrointestinal tract.

**Bile** A secretion of the liver. A thick viscid fluid that has a bitter taste. Used to emulsify dietary fats and oils prior to absorption.

**Bioadhesion** Adhesion of a substance to a biological substrate.

**Bladder** A membranous sac or receptacle for secretions.

**Bleomycin** Any one of a group of antitumour agents produced by *Streptomyces verticillus*.

**Blood-brain barrier** A barrier membrane between circulating blood and the brain preventing damaging substances from reaching the brain and cerebrospinal fluid.

**Bowman's membrane** Membrane separating corneal epithelium from corneal substance.

**Bromisoval (Bromisovalum)** A sedative and hypnotic drug

**Bronchiectasis** Chronic dilatation of a bronchus or bronchi.

**Bronchitis** Inflammation of mucous membrane of the bronchial tubes.

**Brunner's glands** Compound gland of the duodenum and upper jejunum. They secrete a clear alkaline mucinous fluid.

**Budesonide** Corticosteroid used to treat asthma.

**Bulimia nervosa** Disorder which is characterised by binge eating and vomiting to control weight.

**Buprenorphine** Opioid with both agonist and antagonist properties. Used as an adjunct in opioid dependence, premedication and analgesia.

**Buserelin** Gonadorelin analogue used to treat prostate cancer.

**Butorphanol** Anti-migraine drug.

## C

**Caffeine** Alkaloid present in tea, coffee, chocolate and other food and over the counter medications. Actions include stimulation of the central nervous system, decreases total sleep time and increases gastric acid production.

**Calcitonin** Hormone released from the thyroid gland and important in bone formation and calcium metabolism.

**Calcium** Metallic element which must be carried in

- solution by the blood in order to be available for bone growth and metabolism. It is also of great importance in blood coagulation.
- Calcium channel blockers** A group of drugs which slow the influx of calcium into a cell. Used to treat angina, hypertension and supraventricular tachycardia.
- Calveolated cells. See tuft cells**
- Candida** A genus of yeastlike fungi which is part of the normal flora of the mouth, skin, intestinal tract and vagina. One of the most common causes of vaginitis in women of reproductive age.
- Carbamazepine** Drug used to treat temporal lobe epilepsy.
- Carbohydrates** A group of chemicals which include sugars, glycogen, starches, dextrans and celluloses that contain only carbon, oxygen and hydrogen. Basic source of energy for the body.
- Carbomers** Synthetic high molecular weight polymers of acrylic acid cross-linked with either allyl ethers of sucrose or allyl ethers of pentaerithrityl. Used to treat dry eye.
- Carbon dioxide** Colourless gas expelled from the lungs. It is the final metabolic product of carbon compounds present in food.
- Carbonic anhydrase** Enzyme which catalyses the union of water and carbon dioxide to form carbonic acid or reverses the action. Present in red blood cells.
- Carbonic anhydrase inhibitors** Inhibitor of the carbonic anhydrase enzyme used to treat glaucoma.
- Carbopol** Trade name for a series of poly-(acrylic acid) polymers used as bioadhesives due to their polyelectrolyte properties.
- Carboxylesterase** Any enzyme which hydrolyses an ester at the carboxyl linkage.
- Carboxymethylcellulose** A chemically modified cellulose polymer used as a thickening agent and rheological modifier in many formulations.
- Carbromal** Very little used sedative-hypnotic drug.
- Caries** Gradual decay and disintegration of soft or bony tissue or tooth.
- Carteolol** A  $\beta$ -blocker used as a eye drop to reduce intra-ocular pressure.
- Castor oil** Oil expressed from the plant *Ricinus communis*. Used externally as an emollient and internally as a cathartic.
- Cells of Cajal** Located in oesophagus. Precise function not known.
- Cellulose** A structural polysaccharide abundant in plants
- Cellulose acetate phthalate** An acid-insoluble polymer used for enteric coatings
- Cementum** Thin layer of calcified tissue formed by cementoblasts which covers the tooth root.
- Ceramides** Class of lipids which do not contain glycerol.
- Cerebrospinal fluid** A water cushion which protects the brain and spinal cord from impact.
- Cervix** Neck or part of an organ resembling a neck.
- Charcoal** Soft powder prepared from soft charred wood.
- Chewing gum** A substance made for chewing such as polyvinyl acetate. Drugs may be delivered in this form.
- Chief cells** Cells which line the gastric glands and secrete pepsinogen.
- Chitosan** A biopolymer derived from chitin, a major component of animal exoskeletons.
- Chloramphenicol** An broad-spectrum antibiotic originally isolated from *Streptomyces venezuelae*, but is not made synthetically.
- Chlorhexidine** A topical anti-infective agent.
- Chlormadinone acetate** Orally active progestin.
- Chlorobutol** Pharmaceutical preservative.
- Chlorofluorocarbon (CFC)** A volatile liquid or gas used as an aerosol propellant, now banned due to its environmental ozone-damaging properties. Medical devices have exemption from the ban but CFC's are rapidly being replaced in most formulations.
- Cholecystokinin** Also known as cholecystokinin-pancreozymin. A hormone secreted into the blood by the mucosa of the upper intestine. Stimulates gall bladder contraction.
- Cholera** An acute infection which involves the entire small bowel. It is characterised by a watery diarrhoea and vomiting resulting in acute dehydration.
- Cholesterol** A sterol widely distributed in animal tissues. It can be synthesised in the liver and it is a normal constituent of bile.
- Cholinergic agonists** These have their action on autonomic effector cells innervated by post-ganglionic parasympathetic nerves.
- Chondroitin** Polysaccharide present in connective tissue.
- Choroid plexi** Network of blood vessels between the sclera and retina.
- Chylomicrons** Small globule of fat in the fat after digestion and absorption.
- Chyme** Food that has been processed by the stomach. The particle size is reduced, it is hydrated and optimised for delivery to the small intestine where it can be absorbed.
- Chymotrypsin** A proteolytic enzyme present in the intestine. Hydrolyses proteins.
- Ciliogenesis** Formation of cilia.
- Cilioinhibition** Inhibiting the movement of cilia.
- Ciliotoxicity** Toxic to cilia, influencing or stopping the ciliary beat.
- Cimetidine** One of the first  $H_2$  receptor antagonists, for several years the world's no. 1 selling drug. Used to reduce gastric acid production.
- Cinnarizine** Antihistamine used to treat vertigo and nausea associated with Ménière's disease and middle ear surgery.
- Citrate** Anion of the tribasic citric acid, commonly found in fruit juice, and part of the citric acid cycle, a major energy-utilizing metabolic pathway.
- Clara cells** Secreting cells in the surface epithelia of bronchioles.

**Clonazepam** An anticonvulsant drug.

**Clonidine** An antihypertensive drug.

**Codeine** An alkaloid analgesic obtained from opium. Methylmorphine.

**Collagen** The predominant structural protein in animals.

**Colloidal delivery** The use of colloidal particles as drug delivery systems.

**Colloid** A small particle, generally smaller than 1 micrometre in size.

**Conjunctiva** mucus membrane that lines eyelids and is reflected onto the eyeball.

**Connective tissue** Noncellular tissue composed of fibrous proteins having a structural role in many organs.

**Constipation** Difficult defaecation. Infrequent defaecation with hard dry faecal matter.

**Corticosteroids** See steroids.

**Cotransport** A transport process for a molecule which depends on the simultaneous transport of another molecule.

**Creams** Viscous emulsions used to retain and deliver topically applied drugs. Despite their ubiquitous nature the structure of many creams is poorly understood.

**Crohn's disease** Regional inflammation of the ileum (ileitis).

**Crypt** Small sac or cavity extending into an epithelial surface or a tubular gland particularly those found in the intestine.

**Crypts of Lieberkühn** A tubular gland in the intestine which secretes intestinal fluid. Its wall is composed of columnar epithelium with aneth cells at the base. The crypts open between the bases of the villi.

**Crystal suspension** A suspension of crystalline drug in a vehicle, usually oil, often used for intramuscular delivery.

**Cryptococcus** A genus of pathogenic yeastlike fungi.

**Cushing's syndrome** Condition resulting from hypersecretion of pituitary corticosteroids, or from prolonged administration of adrenocortical hormones. Symptoms include adiposity, fatigue, impotence, skin discolouration and excess hair growth.

**Cyanoacrylate microspheres** Colloidal (q.v.) microspheres made from cyanoacrylate polymers. This material has the advantage of being degraded by esterases *in vivo*, thus forming a biodegradable colloid.

**Cyclacillin** A semisynthetic penicillin antibiotic.

**Cyclic AMP** A cyclic nucleotide participating in the activities of many hormones.

**Cyclodextrins** Cyclic polysaccharides with a tubular cylindrical structure which can enclose and solubilize a small hydrophobic molecule in their interior.

**Cyclosporin A** An immunosuppressive agent derived from a micro-organism.

**Cystic fibrosis** An inherited disease affecting exocrine glands. It is characterised by chronic respiratory infection, pancreatic insufficiency and increased electrolytes in sweat.

**Cystic fibrosis transmembrane conductance regulator** The apical or luminal membrane of crypt epithelial cells contain a cyclic AMP-dependent chloride channel known also as the cystic fibrosis transmembrane conductance regulator or CFTR because mutations in the gene for this ion channel result in the disease cystic fibrosis.

**Cytosis** the uptake of materials outside the cell by invagination and enclosure of a portion of the cell membrane.

**Cytosol** the aqueous liquid medium inside the cell, excluding the organelles.

## D

**Danazol** Drug which inhibits pituitary gonadotrophins.

**Decongestant sprays** Nasal aerosols which unblock the congested nasal airways.

**Decylmethyl sulphoxide** A powerful hydrophobic solvent used as a transdermal penetration enhancer.

**Defaecation** The expulsion of faeces.

**Deltoid muscle** Triangular muscle which covers the shoulder.

**Deoxycorticosterone** A hormone from the adrenal gland which controls salt and water metabolism.

**Dermis** The inner layer of the skin, lying beneath the epidermis.

**Descemet's membrane** A fine membrane which lies between the endothelial layer of the cornea and the substantia propria.

**Desmopressin** A synthetic vasopressin analogue used as an antidiuretic.

**Desmosomes** Small spot-like structures joining adjacent cells.

**Dexamethasone** A synthetic glucocorticoid drug.

**Dextran** A polysaccharide used as a viscosity enhancer, and as a hydrophilic macromolecular marker.

**Dextropropoxyphene** Propoxyphene—an analgesic which can cause addiction.

**Diabetes insipidus** Disease caused by insufficient secretion of vasopressin. Characterised by excessive thirst and urine production.

**Diabetes mellitus** A chronic disorder of carbohydrate metabolism. There are two-types, insulin dependant and non-insulin dependant diabetes.

**Diarrhoea** Liquid or watery faeces, often caused by lower gastrointestinal disturbances.

**Diazepam** Anti-anxiety and sedative drug, Trade name is Valium.

**Diazoxide** Drug used in treating hypertension emergencies.

**Dichlorodiphenyltrichloroethane (DDT)** An early insecticide, now ubiquitous throughout the animal and plant kingdom due to overuse.

**Diclofenac** Non-steroidal anti-inflammatory drug used to treat pain and inflammation in rheumatic disease.

- Diffusion coefficient** Constant of proportionality in Fick's law, a measure of the speed with which a molecule diffuses in a specified environment.
- Diflunisal** Non-steroidal anti-inflammatory drug used to treat pain and inflammation in rheumatic disease.
- Digoxin** A cardiac glycoside derived from the fox-glove.
- Dimethyl sulphoxide** A powerful hydrophobic solvent used as a transdermal penetration enhancer.
- Dipalmitoyl lecithin** A phospholipid in which both acyl chains are derived from palmitic acid.
- Disaccharides** Small carbohydrates formed by linking two simple sugar molecules, the best-known example being sucrose.
- Disodium cromoglycate** Sodium cromoglycate. Mast cell stabilizer used to treat asthma, food allergies and allergic rhinitis.
- Disopyramide** Drug used to treat ventricular arrhythmia.
- DNA** Deoxyribonucleic acid, the nuclear component carrying the genetic code.
- Domperidone** An anti-nausea drug.
- Dopamine** A catecholamine synthesized by the adrenal gland. It is the precursor of noradrenaline. Also a neurotransmitter or brain messenger.
- Dorzolamide** A carbonic anhydrase inhibitor used in the treatment of glaucoma.
- Doxycycline** A broad-spectrum tetracycline antibiotic.
- Duodenal receptors** Receptors located in the duodenum, sensing the calorific load delivered to the small intestine.
- Duodenogastric reflux** Reflux of duodenal contents (often containing bile) into the stomach.
- Duodenum** The short length of gastrointestinal tract situated between the lower gastric pylorus and the small intestine.
- Dyspepsia** Vague term applied to a variety of upper gastrointestinal symptoms, often associated with food consumption and acid secretion.
- E**
- Eccrine sweat glands** Gland distributed over the entire skin surface which secrete sweat and are essential for regulation of body temperature.
- EDTA** Ethylene diaminetetracetic acid. A powerful chelating agent which binds many metal cations
- Eicosanoids** All of the products of metabolism of arachidonic acid.
- Elastin** An extracellular connective tissue protein that is principal component of elastic fibres.
- Electroosmosis** The movement of solvent to balance the osmotic pressure due to movement of ions in an electric field.
- Electropermeabilization** See electroporation.
- Electroporation** The permabilization of cell membranes by brief high voltage electric pulses.
- Embolism** A blockage in a blood vessel caused by a solid particle, gas bubble, blood clot, or oil droplet.
- Emphysema** A chronic pulmonary disease characterised increase in the size of air spaces and destructive changes to the wall.
- Emulsions** Codispersions of two immiscible liquids, normally requiring an emulsifier to remain stable.
- Endocrine** An internal secretion. Endocrine gland secretes directly into the bloodstream.
- Endocytosis** Ingestion of foreign substances by a cell.
- Endometriosis** Ectopic endometrium located in various sites throughout the pelvis or in the abdominal wall. It causes pelvic pain and can cause infertility.
- Endometrium** Mucous membrane lining the inner surface of the uterus.
- Endoscopy** The use of a viewing device such as a miniature camera or fibre optic probe to view inside the body.
- Endotoxins** Bacterial toxin confined within the body of a bacterium and is released only when the bacterium is broken down.
- Enprofylline** A phosphodiesterase inhibitor of the xanthine type
- Enterocoele** Hernia of the intestine through the vagina or posterior vaginal hernia.
- Enterocytes** Intestinal cell.
- Enteroglucagon** Hormone release from the small intestinal endocrine cells.
- Enterohaptic recirculation** Bile acids are poorly absorbed in the proximal small intestine, but are absorbed by an active process in the terminal ileum. After absorption, bile acids have a high hepatic clearance and are re-secreted in the bile.
- Enterokinase** Previous term used for enteropeptidase.
- Enteropeptidase** Enzyme occurring in the mucosa of the duodenum essential for the activation of the trypsinogen to trypsin.
- Enuresis** Involuntary discharge of urine.
- Eosinophilia** Presence of an unusual number of eosinophils in the blood.
- Ephelides** Freckles.
- Epidermis** The outer layer of skin cells.
- Epimysium** Outermost sheath of connective tissue that surrounds a skeletal muscle.
- Ergotamine tartate** A alkaloid derived from ergot. Stimulates smooth muscle of blood vessels and the uterus inducing vasoconstriction and uterine contractions.
- Erythema** Redness of the skin.
- Erythrocyte ghost** The cell membrane of an erythrocyte emptied of its intracellular contents.
- Erythromycin** An antibiotic from *Streptomyces erythraeus*. It is active against many gram positive and some gram negative bacteria.
- Erythropoietin** A hormone which stimulates red blood cell production.
- Escherichia coli** One of the most common faecal bacteria.

- Esterase** An enzyme which degrades an ester, usually into an alcohol and a carboxylic acid.
- Esters** Compounds formed by reaction between an alcohol and a carboxylic acid.
- Ethinylestradiol** Synthetic oestrogen.
- Ethmoid bone** Spongy bone which forms the roof of the nasal fossae.
- Ethyl oleate** An oil commonly used as a pharmaceutical excipient.
- Ethylcellulose** A chemically modified cellulose used as a pharmaceutical excipient.
- Ethylenediaminepentaacetic acid** A powerful chelating agent which binds many metal cations.
- Eudragit** Trade name for a series of wax-based pharmaceutical excipients.
- Extravasation** The escape of fluids into the surrounding tissue.

## F

- Faraday crispations** Fluctuations in the surface of a liquid induced by ultrasound, leading to the production of aerosol droplets.
- Fatty acids** Carboxylic acid derivatives of higher alkanes, generally 4–24 carbon atoms long, often unsaturated.
- Fenoterol** Adrenoceptor stimulant used to treat reversible airways constriction.
- Ferrireductase** A cytochrome P450 reductase which converts ferric to ferrous iron.
- Fibrinogen** A protein present in the blood plasma essential for clotting.
- Fibronectin** A group of proteins present in blood plasma and extracellular matrix.
- Fick's law** Fundamental relation between diffusion rate and concentration gradient.
- First-pass metabolism** Blood from the small intestine goes directly to the liver where nutrients and some drugs are metabolised substantially. This can result in the loss of a large proportion of active drug before it can reach its target site.
- Flunisolide** Corticosteroid used in the prophylaxis and treatment of allergic rhinitis.
- Fluorescein** Strongly fluorescent dye often used as a biochemical marker.
- Fluorocarbons** Organic molecules in which a substantial fraction of the hydrogen atoms have been replaced by fluorine. If all the hydrogen has been replaced they are termed perfluorocarbons. These molecules dissolve substantial amounts of respiratory gases and have been widely studied for the formulation of blood substitutes.
- Folds of kerckring** Folding of the epithelium to increase surface area.
- Formaldehyde** The simplest aliphatic aldehyde, CH<sub>2</sub>O, used as a preservative. It denatures proteins and is highly toxic.
- Foveola** A minute pit of depression.
- Frenulum linguae** Fold of mucous membrane which runs from the floor of the mouth to the inferior surface of the tongue.

- Fundus** The larger part, base or body of a hollow organ or the portion of the organ furthest from the opening. The fundus of the stomach is closest to the oesophagus.

## G

- GALT** See gut-associated lymphoid tissue.
- Gamma scintigraphy** The use of gamma emitting radionuclides to study behaviour of drug formulations within the body for research. It is a routine technique in nuclear medicine for diagnosis. Requires a gamma camera.
- Ganciclovir** Antiviral drug.
- Gastric glands** cardiac, fundic or oxyntic and pyloric glands of the stomach.
- Gastric inhibitory peptide (GIP)** A polypeptide in the cells of the duodenum and jejunum which acts to inhibit secretion of gastric acid.
- Gastrin** A hormone secreted by the pyloric area of the stomach and duodenum to stimulate gastric secretion.
- Gastritis** Inflammation of the stomach.
- Gastro-oesophageal junction** Region where the stomach and oesophagus meet. Gastric tissue lines the first few centimetres of the oesophagus to protect it from acid damage.
- Gastro-oesophageal reflux** Reflux of gastric contents into the oesophagus where it can cause oesophagitis. Causes the classic symptom of "heartburn".
- Gastrocolic reflex** Peristaltic wave in the colon initiated by the intake of food into the stomach.
- Gelatinase** Enzyme which breaks down gelatin.
- Gellan gum** A polysaccharide used as a rheological modifier in pharmacy and as a food additive.
- Gelling polymers** Polymers which form gels in solution.
- Gels** Solutions which have become rigid due to a linked polymer network.
- Gentamicin** Aminoglycoside used in the treatment of serious infection.
- Giant unilamellar vesicles** Large (several micrometres) single-layered liposomes.
- Gingiva** The gum and tissue that surrounds the neck of the teeth.
- Gingivitis** Inflammation of the gums.
- Glands of Kraus** Small glands in the conjunctiva of the eyelids.
- Glands of Manz** Small glands which secrete the mucoid layer or tears.
- Glands of Wolfring** Produces the watery lacrimal secretion of tears.
- Glands of Zeis** Large sebaceous glands found in the eyelids.
- Glaucoma** Elevation of intraocular pressure.
- Globulin** One of a group of simple proteins insoluble in water but soluble in neutral solutions of salts and strong acids.
- Glucagon** Polypeptide hormone which increases the concentration of glucose in the blood.
- Glucocorticoids** A general classification of hormones produced by the adrenal cortex and are primarily active in protecting against stress.

- Glucose-6-phosphate dehydrogenase (G-6-PD)** An enzyme which dehydrogenates glucose-6-phosphate to form 6-phosphoglucon. This is the initial step in the pentose phosphate pathway of glucose catabolism.
- Glucuronic acid** Important acid in human metabolism by virtue of its detoxifying action.
- Glucuronosyltransferases** Liver enzymes responsible for glucuronidation of xenobiotics.
- Glutamine** The monoamide of aminoglutaric acid. It is present in the juices of many plants and is essential in the hydrolysis of proteins.
- Glutamic oxaloacetic transaminase** A metabolic enzyme found in liver and heart tissue which is released into the bloodstream by tissue damage, and hence used as a therapeutic indicator.
- Glutamic pyruvic transaminase** see glutamic oxaloacetic transaminase.
- Glutathione** A tripeptide of glutamic acid, cysteine and glycine. Important in cellular respiration.
- Glycerol** A simple polyhydric alcohol, propane 1, 2, 3-triol.
- Glyceryl trinitrate.** See nitroglycerin.
- Glycine** The simplest amino-acid.
- Glycocalyx** A thin layer of glycoprotein and polysaccharide which covers the surface of some cells such as muscle.
- Glycofurol** A polar solvent used mainly in cosmetics and creams.
- Glycogen** A polysaccharide commonly called animal starch. The conversion of glycogen to glucose is called glycogenolysis. Glycogen is the form by which carbohydrate is stored in the body.
- Glycolipids** Lipids with an attached sugar molecule.
- Glycoprotein** A protein with an attached polysaccharide chain, often membrane-resident and conferring antigenic properties.
- Glycosaminoglycan** A mucopolysaccharide found in cell walls and mucus.
- Goblet cells** Secrete mucus in the gastrointestinal and respiratory tracts.
- Gradient-charged system** A controlled release system in which the concentration of drug varies throughout its thickness in order to achieve a specified release profile.
- Gramicidin D** An antibiotic.
- Greenhouse gases** Gases which absorb solar infrared radiation, causing an elevation in the Earth's temperature.
- Griseofulvin** An antifungal agent. Its poor water solubility led to its being used as a model drug for a wide range of formulation studies.
- Guar gum** A plant polysaccharide used as a viscosity modifier, pharmaceutical excipient, and food additive.
- Guinea pig** Small furry animal so widely used for experimental studies that it has given its name idiomatically to anyone or anything who is the subject of a novel experiment or trial.
- Gut associated lymphoid tissue (GALT)** term applied to all lymphoid tissue associated with the gastrointestinal tract including tonsils, appendix and Payer's patches. It is responsible for controlling the entry of organisms via the gastrointestinal tract.
- ## H
- H<sup>+</sup>/K<sup>+</sup> ATPase** The active transporter system responsible for pumping acid (H<sup>+</sup>) into the gastric lumen.
- H<sub>1</sub> receptors** Histamine receptors found in the cells of the bronchiole muscle.
- H<sub>2</sub> receptors** Histamine receptors found in the cells that secrete gastric acid.
- Haemoglobin** The mammalian oxygen transport protein located in the erythrocytes.
- Haemolysis** Disintegration of red blood cells with the release of haemoglobin.
- Haemorrhoidal plexus** The network of blood vessels surrounding the anal canal.
- Haustra** Sacculated pouches of the colon.
- Hayfever** Hypersensitivity of the eye and upper respiratory tract to inhaled pollens.
- Heartburn** See gastro-oesophageal reflux.
- Helicobacter pylori** An organism which lives beneath the mucus layer in the stomach and is associated with gastritis.
- HEMA** See hydroxyethyl methacrylate.
- Hemidesmosomes** See desmosomes.
- Heparin** A polysaccharide which inhibits blood coagulation.
- Hepatic flexure** The junction of the ascending and transverse colon.
- Hepatic portal vein** See also first pass metabolism. Only main vein in the body which does not go directly to the heart. It links the gastrointestinal tract to the liver.
- Hexose transporter system** An active transport system which transfers hexoses across the cell membrane.
- HFAs** See hydrofluoroalkanes.
- Histamine** A substance produced from the amino acid histidine. It is released from injured cells. Histamine increases gastric secretion, dilatation of capillaries and contraction of bronchial smooth muscle.
- Histidine** An amino acid obtained by hydrolysis from tissue proteins, necessary for tissue repair and growth.
- Histiocytes** A macrophage present in all loose connective tissue.
- HIV infection** Human immunodeficiency virus also known as AIDS (acquired immune deficiency syndrome).
- Horseradish peroxidase** Used to study aqueous pathways between cells.
- Housekeeper contractions** See migrating myoelectric complex.
- Humidification** saturation of air with water, esp. in the nose, so that the airflow does not dehydrate deeper tissues
- Hyaluronic acid** An acid mucopolysaccharide found in the ground substance of connective tissue that acts as a binding and protective agent. Also

found in the synovial fluid and aqueous and vitreous humors.

**Hyaluronidase** Enzyme found in the testes and is present in the semen. It depolymerises hyaluronic acid and acts to disperse cells of the ovum thus facilitating entry of sperm.

**Hydrochloric acid** HCl, the acid secreted in the stomach.

**Hydrochlorthiazide** A diuretic.

**Hydrocortisone** A corticosteroid hormone produced by the adrenal cortex.

**Hydrocyanic acid** HCN, the acid from which cyanides are derived.

**Hydrodynamically balanced system** A drug delivery device designed to have the same density as the gastric contents.

**Hydrofluoroalkanes** Alkanes in which a number of hydrogen atoms have been replaced by fluorine, replacing chlorofluorocarbons as aerosol propellants since they do not damage the ozone layer.

**Hydrogels** Hydrophilic gels formed from a range of polymers, esp. polyions such as hydroxyethyl methacrylate.

**Hydrogen sulphide** H<sub>2</sub>S, a toxic and malodorous gas commonly formed during digestion of sulphur-containing foods.

**Hydrolases** An enzyme that causes hydrolysis.

**Hydroxyethyl methacrylate** A hydrophilic gel-forming polymer.

**Hydroxyethylcellulose** A chemically modified cellulose used as a pharmaceutical excipient.

**Hydroxyproline** An amino-acid.

**Hydroxypropylcellulose** A chemically modified cellulose used as a pharmaceutical excipient.

**Hydroxypropylmethylcellulose** A chemically modified cellulose used as a pharmaceutical excipient.

**5-Hydroxytryptamine** See Serotonin.

**Hypogonadism** Excessive secretions of the sex glands.

## I

**IgA** See Immunoglobulins.

**IgG** See Immunoglobulins.

**Ileocaecal junction** Junction between the small intestine and ascending colon.

**Iliac fossa** One of the concavities of the iliac bones of the pelvis.

**Immunoglobulins** One of a family of closely related proteins capable of acting as antibodies.

**Impotence** Absence of sexual power.

**Indomethacin** Anti-inflammatory drug used extensively to treat rheumatoid arthritis.

**Infertility** Inability of reduced ability to have children.

**Inflammatory bowel disease** Associated with pain, constipation or diarrhoea.

**Insulin** A hormone secreted by the islets of Langerhans of the pancreas. Essential for the metabolism of blood sugar.

**Integument** A covering or skin.

**Interferon** A group of proteins released by white blood cells and fibroblasts in response to viral

invasion. They inhibit the production of the virus within infected cells.

**Intrinsic factor of Castle** A substance present in the gastric juice that makes absorption of vitamin B<sub>12</sub>.

**Inulin** A polysaccharide found in plants. It is used to study renal function.

**Ion exchange resins** Polymer resins with numerous ionized sites which can reversibly bind a number of ions; commonly used for separation and purification purposes.

**Iontophoresis** The process of forcing an ionized drug to pass into a tissue using an electric current.

**Ipratropium bromide** Anticholinergic drug used to control asthma.

**Isomaltase** A membrane protein involved in carbohydrate metabolism.

**Isoprenaline** An inotropic sympathomimetic used to treat heart block and severe bradycardia.

**Ispaghula** Bulk-forming laxative.

**IUDs** See intrauterine devices.

## J

**Jet nebulizer** A nebulizer in which a liquid stream is dispersed by a jet of air under high pressure.

## K

**Kanamycin** Aminoglycoside antibiotic now superseded by other aminoglycosides

**Keratinocytes** Any one of the cells in the skin that synthesize keratin.

**Kerkring's folds** See Folds of Kerkring.

**Ketobemidone** An opiate analgesic.

**Kupffer cells** A variety of macrophage cells found in the liver.

## L

**L-tryptophan** An aromatic amino-acid

**Labrafl WL** A waxy material used as a pharmaceutical excipient

**Lactase** An intestinal enzyme which splits lactose into dextrose and galactose.

**Lactate dehydrogenase** An enzyme which is important in the oxidation of lactate.

**Lacteal** Pert. To milk or an intestinal lymphatic that takes up chyle and passes it to the lymphatic system.

**Lactic acid** Formed during muscular activity by the breakdown of glycogen.

**Lactic dehydrogenase** See Lactate dehydrogenase.

**Lactobacillus** A genus of gram positive, nonmotile rod shaped bacteria. They are responsible for the souring of milk as they produce lactic acid from carbohydrates.

**Lactobacillus acidophilus** Organism which produces lactic acid by fermenting sugars in milk. Found in the faeces of bottle-fed infants and adults. Also present in carious teeth and the human vagina.



**Lactose** Disaccharide that hydrolyses to yield glucose and galactose.

**Lactulose** A synthetic disaccharide that is not digested or absorbed in humans. It is metabolised by colonic bacteria.

**Lamina cribrosa** Cribriform plate of the ethmoid bone.

**Lamina propria** Thin layer of fibrous connective tissue that lies immediately below the surface epithelium of mucous membranes.

**Langerhans Islets** of Special cells scattered through the pancreas which secrete insulin.

**Langmuir trough** An apparatus which allows surface-active molecules to be studied as films on the surface of a liquid.

**Lanolin** A wax derived from sheep fat used in a number of topical formulations.

**Lanthanum** A rare-earth element used in colloidal form as a marker.

**Laryngectomy** Removal of the larynx.

**Lateral diffusion** Transverse diffusion of a solute in a 2-dimensional system such as a lipid membrane.

**Laureth-9** Non-ionic detergent.

**LCFA** See long-chain fatty acids

**Lecithins** Generic name for a wide range of natural phospholipids, generally implying a heterogeneous mixture of headgroups and acyl chains.

**Lectins** Plant protein which causes stimulation of lymphocytes to proliferate.

**Leucine aminopeptidase** A proteolytic enzyme present in the pancreas, liver and small intestine.

**Leucotrienes** A group of arachidonic acid metabolites which function as chemical mediators for inflammation. Leucotrienes C<sub>4</sub>, D<sub>4</sub> and E<sub>4</sub> constitutes what was formally known as slow-releasing substance of anaphylaxis (SRS-A).

**Leucotriene inhibitors** Used in the prophylaxis and treatment of asthma.

**Levonorgestrel** A steroid hormone used as a contraceptive.

**Lidocaine** A local anaesthetic.

**Limbus** The edge or border of a part.

**Lipases** Enzymes which degrade lipids

**Lipids** A generic name for a wide variety of fatty materials.

**Liposomes** hollow vesicular structures formed when phospholipids (lecithins) are dispersed in water. They contain an enclosed aqueous space which can be used to entrap and deliver hydrophilic molecules.

**Lithium** The smallest alkali metal, used in the treatment of certain mental disorders.

**Locust bean gum** A plant gum used as a food additive and excipient.

**Long-chain fatty acids** Fatty acids in which the alkane chain is generally longer than 12–14 carbon atoms.

**Loperamide** Antimotility drug used to treat diarrhoea.

**Lorazepam** Benzodiazepine used to treat anxiety, status epilepticus or insomnia.

**Lotion** Liquid applied to the skin.

**Lower oesophageal sphincter** Also known as the cardia. Sphincter which is located between the stomach and oesophagus and serves to prevent gastro-oesophageal reflux.

**Loxiglumide** Highly potent cholecystokinin receptor antagonist. It inhibits postprandial gall bladder contraction and causes accelerated gastric emptying.

**Lozenge** A drug delivery system designed to dissolve slowly in the mouth.

**Lymphocytes** Cell present in the blood and lymphatic tissue. These cells travel from the blood the the lymph and back again. They provide the main immune capability of the body.

**Lymphoglandula** Lymph gland.

**Lyppressin** A posterior pituitary hormone obtained from pigs and used as an antidiuretic.

**Lysine** An amino-acid.

**Lysosome** Part of an intracellular digestive system that exists as separate particles in the cell. Inside their limiting membrane they are capable of breaking down and certain carbohydrates.

**Lysozyme** Enzyme now called muramidase. Found in blood cells.

## M

**Macrophages** They have the ability to recognise and ingest all foreign antigens through receptors on the surface of their cell membranes. 50% of all macrophages are found in the Kupffer cells of the liver.

**Malic acid** Found in some fruits such as apples. Active in aerobic metabolism of carbohydrates.

**Maltase** A salivary and pancreatic enzyme that acts on maltose hydrolysing it to glucose.

**Maltose** A disaccharide present in malt, malt products and sprouting seeds. Maltase hydrolyses it to glucose.

**Maltotriose** A small carbohydrate produced by the action of salivary Amylase on starch.

**Mast cells** Cells which are located in the connective tissue just below epithelial surfaces, serous cavities and around blood vessels. They synthesize and store histamine. When stimulated they release all mediators of inflammation including leukotrienes. They produce the signs of hypersensitivity reactions.

**Matrix-diffusion controlled system** A controlled release device whose release rate is determined by the diffusion rate of the drug through a polymer matrix.

**M-Cells** these cells are located in the small intestine where they play an important part in the immune system. They lack fully developed microvilli, but are pinocytic and contain many vesicles.

**MDR** See multi-drug resistance.

**Medoxyprogesterone acetate** A progestational agent used intramuscularly.

**Meibomian glands** One of the sebaceous glands between the tarsi and conjunctiva of eyelids.

- Pectoral muscle** Chest muscle.
- Penbutolol** A  $\beta$  adrenergic blocking drug.
- Penetration enhancers** Compounds which promote absorption of drugs. Usually their action is non-specific.
- Penicillin** One of a group of antibiotics biosynthesized by several species of mold.
- Pepsin** Chief enzyme of gastric juice which converts proteins into proteoses and peptones. It is formed by the chief cells of the gastric glands.
- Pepsinogen** Pepsin precursor.
- Peptides** Building blocks of proteins formed from amino acids.
- Perfusion** Passing of fluid through spaces.
- Perimysium** Connective tissue sheath which envelops each bundle of muscle fibres.
- Periodontal disease** Disease of the supporting structures of the teeth.
- Periodontitis** Inflammation or degeneration or both of the dental periostium, alveolar bone, cementum and adjacent gingiva.
- Periodontosis** Any degenerative disease of the periodontal tissues.
- Peritoneum** The serous membrane reflected over the viscera and lining of the abdominal cavity.
- Persorption** Sloughing off of cells from the tips of villi in the small intestine leaves a gap through which particles can enter the blood stream.
- Pessaries** drug delivery device or supporting structure inserted into the vagina.
- Pethidine** Also known as Peridine. Opioid analgesic used for moderate to severe pain.
- Petrolatum** A purified semisolid mixture of hydrocarbons obtained from petroleum.
- Petrolatum based jelly** A purified semisolid mixture of hydrocarbons obtained from petroleum which is decolourised and stabilized.
- Peyer's patches** An aggregation of lymph nodules found chiefly in the ileum near to its junction with the colon. They are circular or oval and about 1 cm wide and 2–3 cm long.
- pH** Measurement of acidity and alkalinity ranging from 0 (acid) to 14 (alkaline). pH 7 is neutral. Formula is  $\text{pH} = -\log[\text{H}^+]$ . As the scale is logarithmic, there is a 10 fold difference between each unit.
- pH-partition hypothesis** The principle that drug passage through a membrane is controlled by the pH of the environment since this controls the ionization of the drug, which can only be absorbed in its unionized state.
- Phagocytosis** Ingestion and digestion of bacteria and particles by phagocytes.
- Pharmacokinetics** Study of the metabolism and action of drugs with particular emphasis on the time required for absorption, duration of action, distribution in the body and method of excretion.
- Phenobarbital** A hypnotic drug. long-acting sedative and anti-convulsant.
- Phenol red** A dye used as a pH indicator.
- Phenylalanine** An aromatic amino-acid.
- Phenylephrine** Vasoconstrictor and pressor drug similar to adrenaline, but more stable.
- Phlebitis** Irritation of a blood vessel.
- Phonation** Speaking; the act of making a sound.
- Phosphatidylcholine (PC)** One of the commonest phospholipids, consisting of a glycerol backbone in which the 1- and 2-alcohol groups are esterified to fatty acids, while the 3-alcohol is esterified to a phosphate group. The phosphate is in turn joined to a *headgroup*, which is choline in the case of phosphatidylcholine.
- Phosphatidylethanolamine (PE)** A phospholipid in which the headgroup is ethanolamine. See phosphatidylcholine.
- Phosphatidylinositol (PI)** A phospholipid in which the headgroup is inositol. See phosphatidylcholine.
- Phosphatidylserine (PS)** A phospholipid in which the headgroup is serine. See phosphatidylcholine.
- Phosphoglucomutase** An enzyme which interconverts glucose-1 phosphate and glucose-6-phosphate.
- Phospholipid; stealth** A phospholipid carrying an ethylene oxide chain attached to the headgroup, which forms a heavily hydrated outer layer when the phospholipid is formed into liposomes. This reduces the extent which the liposomes are recognised by the reticuloendothelial system.
- Pilocarpine** Alkaloid which is used to cause contraction of the pupil.
- Pituitary hormones** Hormones secreted from the pituitary gland which regulate many body processes. These include growth hormone, adrenocorticotrophic hormone which regulates functional activity of the adrenal cortex, thyrotrophic hormone which regulates activity of the thyroid gland and gonadotrophic hormone amongst others.
- Plaque** A patch on the skin or on a mucous surface. A blood platelet. Dental plaque is a gummy mass of microorganisms that grows on the crowns and spreads along the roots of teeth. These are the forerunner of caries.
- Plasma membrane** The outer membrane of the cell, composed of phospholipids, proteins, etc.
- Platelets** A round or oval disk 2 to 4  $\mu\text{m}$  in diameter found in the blood. They are important for coagulation.
- Plicae semilunares** Transverse fold of mucosa of the large intestine lying between sacculations.
- Pluronic<sup>®</sup>** Trade name for a range of poly (ethylene oxide)-poly (propylene oxide)-poly (ethylene oxide) triblock copolymers widely used in drug formulation and delivery.
- pMDI** See pressurized metered dose inhalers.
- Polyacrylic acid** A copolymer of acrylic acid.
- Polyalkylene glycols** Block copolymers of the form HO-(R-O)-H where R is any alkyl group. Polyethylene glycol and polypropylene glycol are the most commonly encountered.
- Polycarbophil** Generic name for crosslinked acrylic acid copolymers used as thickening agents and bioadhesives.
- Polyethylene** One of the earliest polymers, consisting

- of a long alkyl chain, formed by polymerizing ethylene.
- Polyps** A tumor with a pedicle. Commonly found in vascular organs such as the nose, uterus and rectum.
- Polysaccharides** Biopolymers formed from chains of carbohydrate (sugar) molecules.
- Polysorbates** Complicated surfactants formed by esterifying sorbitol with fatty acids to render it hydrophobic, and conjugating poly (ethylene oxide) to provide hydrophilic groups. Available commercially as the Tween® series of surfactants.
- Polyurethane** A polymer widely used in medical devices such as catheters.
- Polyvinyl alcohol** A water soluble polymer made by polymerizing vinyl alcohol, commonly used as a surfactant and viscosity enhancer in drug delivery systems.
- Polyvinylpyrrolidone** A polymer used as a swelling agent and binder in formulation.
- Positron emission tomography (PET)** Reconstruction imaging of various organs by using various positron emitting isotopes.
- Prazosin** A drug used in treating hypertension.
- Prednisolone** A glucocorticosteroid drug.
- Preservatives** Compounds added to a formulation to enhance stability. They include antibacterials, antioxidants, and chelating agents.
- Pressurized metered dose inhalers** Miniature aerosols which use a metering valve to eject a fixed dose of drug for inhalation therapy.
- Progesterone** A steroid hormone obtained from the corpus luteum and placenta. It is responsible for the changes in the endometrium in the second half of the menstrual cycle.
- Progestin** A corpus luteum hormone which prepares the endometrium for implantation of the fertilized ovum.
- Prolapse** A falling or dropping of an organ or internal part e.g. uterus or rectum.
- Proline** An amino-acid.
- Promethazine** An anti-histamine.
- Propranolol** A  $\beta$  adrenergic blocking drug.
- Propylene glycol** Propane (1, 2 diol), a solvent widely used in the formulation of creams and injectables.
- Prostaglandins** A large group of biologically active unsaturated fatty acids. They are short range autocooids which have a wide range of actions including lipolysis, fluid balance, platelet aggregation, blood flow, gastrointestinal function, neurotransmission, pancreatic endocrine function and corpus luteum regression.
- Prostap** A morphiate narcotic antagonist.
- Proteoglycans** Structural polysaccharides found in cartilage.
- Ptyalin** Salivary enzyme which hydrolyses starch and glycogen to maltose and a small amount of glucose.
- Pylorectomy** Surgical removal of the pylorus.
- Pyloroplasty** Operation to repair the pylorus especially one to increase the diameter of the pylorus by stretching.
- Pyrogens** Any substance which induces fever.

## Q

**Quinine** An alkaloid derived from cinchona bark, one of the first successful antimalarials.

## R

**Racemose glands** Glands which resemble a bunch of grapes.

**Radiolabelling** the act of making a drug or formulation radioactive to facilitate its tracking in vivo or the study of its metabolism.

**Radiotelemetry capsule** A capsule containing a small transmitter which can be swallowed or implanted, and transmits the value of a physiological variable, commonly pH or pressure.

**Ranitidine**  $H_2$  receptor antagonist used to reduce acid secretion.

**Rectocele** protrusion or herniation of the posterior vaginal wall with anterior wall of the rectum through the vaginal.

**Reserpine** Drug which lowers blood pressure and acts as a tranquiliser.

**Respiration** Interchange of oxygen and carbon dioxide by breathing.

**Reticulin** An albuminoid or scleroprotein substance in the connective tissue framework or reticular tissue.

**Reticuloendothelial system** The collection of immune cells such as macrophages which identify and remove foreign materials.

**Rhinitis** Inflammation of the nasal mucosa.

**Rhinorrhea** Thin watery discharge from the nose. Riboflavin Vitamin  $B_{12}$  essential for tissue repair.

**Rivinus's gland** A sublingual gland.

**Rivotril** Trade name for Clonazepam, a benzodiazepine.

**Ryle's tube** A small bore gastric tube, weighted at the tip and generally inserted through the nose.

## S

**Saccharin** Artificial sweetener.

**Salbutamol**  $\beta_2$  adrenoceptor agonist used to treat asthma. Also called Albuterol.

**Salicylates** Salts of salicylic acid.

**Salicylazosulphapyridine** See sulphasalazine. Salicylic acid o-hydroxybenzoic acid, one of the earliest analgesics, derived from willow bark.

**SCFA** See short-chain fatty acids.

**Sebom** Fatty secretion of sebaceous glands of the skin.

**Secretin** A hormone which stimulates pepsinogen secretion by the stomach and inhibits the secretion of acid by the stomach.

**Sennosides** Anthraquinone glucosides present in senna and used as cathartics.

**Sephadex®** Trade name for a polymeric gel with pores of controlled sizes, commonly used for

- size exclusion (gel filtration) chromatography, in which macromolecules are separated on the basis of their molecular weight.
- Serotonin** Also known as 5-hydroxytryptamine, a chemical present in platelets, gastrointestinal mucosa, mast cells and carcinoid tumors. It is also believed to be important in sleep and sensory perceptions.
- Shellac** A natural resin derived from the dried secretions of the lac insect.
- Short-chain fatty acids** Fatty acids with an acyl chain of less than 5–6 carbon atoms.
- Sialase** An enzyme which degrades sialic acid.
- Sialic acid** An amino-sugar widely found in mucus polysaccharides
- Silicones** Polymers based on silicon rather than carbon.
- Silicones elastomers** Highly flexible and elastic cross-linked silicone polymers used for medical devices such as catheters.
- Silicones oil** medium-chain silicone polymers widely used as viscosity standards.
- Single photon emission computed tomography (SPECT)** An imaging method which allows reconstructions of cross-sections through the body of a radiotracer.
- Sinusitis** Inflammation of the sinuses.
- Skene's glands** Glands lying just inside and on the posterior of the female urethra
- Slow-reacting substance of anaphylaxis** See Leucotrienes.
- Smallpox** Acute contagious disease, which is regarded to have been eradicated in the modern world.
- Smoking** Inhalation of cigarette or cigar smoke. Persons indulging in this habit are at risk of extreme damage to their lungs.
- Sodium alginate** A viscous carbohydrate biopolymer derived from various seaweeds. Used in oral controlled release devices and to form a floating gastric 'raft' in antireflux agents.
- Sodium azodisalicylate** Seeosalazine.
- Sodium caprate** Salt of capric acid, a short-chain fatty acid.
- Sodium cromoglycate** See Disodium cromoglycate
- Sodium deoxycholate** A surfactant with a steroid nucleus found in bile, whose purpose is to emulsify and transport fats during digestion. Used as a solubilizing agent and emulsifier in some drug formulations.
- Sodium glycocholate** A surfactant similar to sodium deoxycholate (q.v.).
- Sodium hyaluronate** A polysaccharide used to treat osteoarthritis of the knee. It is injected intraarticularly to supplement natural hyaluronic acid.
- Sodium laurate** Sodium salt of dodecanoic acid, used as a surfactant.
- Sodium lauryl sulphate** An anionic surface active agent used in pharmaceuticals.
- Sodium taurocholate** A surfactant similar to sodium deoxycholate (q.v.).
- Sodium valproate** An anti-epileptic drug.
- Sodium-potassium exchange pump** An alternative name for the  $\text{Na}^+/\text{K}^+$  ATPase.
- Solution** A liquid containing a dissolved substance. The liquid into which the substance is dissolved is called the solvent. The solute is the substance which is dissolved.
- Solvent drag** Proposal that the amount of water present in the small intestine affects paracellular drug absorption and may affect the absorption of small and hydrophilic drugs.
- Somatostatin** A hormone which inhibits the release of somatotropin. It is a hypothalamic peptide that also inhibits the secretion of insulin and gastrin.
- Sonophoresis** The use of ultrasound to increase the absorption of drugs through the skin.
- Spacer devices** These are used with pressurised inhalers. They provide a space between the device and the mouth reducing the velocity of the aerosol and the subsequent impaction on the oropharynx. They also allow greater evaporation of the propellant so a larger proportion of the drug can be inhaled into the lung.
- Span** Trade name for a family of hydrophilic surfactants produced by esterifying fatty acids with a hydrophilic sorbitol nucleus.
- Splenic flexure** Junction of the transverse and descending colon.
- Squalane** An unsaturated carbohydrate present in shark-liver oil and some vegetable oils. It is an intermediate in the biosynthesis of cholesterol.
- Squamous epithelia** Flat form of epithelial cells.
- SRS-A** See Leucotrienes.
- Starch** Carbohydrate of the polysaccharide group found in plants. And includes pectins, dextrans and gums. All are reduced to simple sugars before being absorbed.
- Status epilepticus** A type of epileptic seizure.
- Stem cells** Cell which gives rise to a specific type of cell.
- Stensen's duct** Excretory duct of the parotid gland.
- Stercobilin** Brown pigment derived from bile. Gives the colour to faeces.
- Steroid** A term applied to a large group of substances chemically related to sterol. Includes sterols, D vitamins, bile acids and certain hormones.
- Sterol** A group of substances related to fats and belonging to the lipoids. They are found in both plants and animals.
- Stilboestrol** A synthetic preparation possessing oestrogenic properties. It is several times more potent than the natural compound and may be given orally.
- Stomach** Sac-like distensible portion of the gut. It lies between the oesophagus and small intestine. It acts as the initial receptacle for ingested food where it processes it to chyme (q.v.). Stokes' law The relationship between settling rate, particle size, and viscosity in a particle suspension.
- Stratum basale** Innermost layer of the uterus.
- Stratum compactum** Superficial layer of the endometrium.

**Stratum corneum** Outermost horny layer of the epidermis.

**Stratum germinativum** Innermost layer of the epidermis.

**Stratum spongiosum** Middle layer of the uterus.

**Stroma** Formation supporting tissues of an organ.

**Subclavian vein** Large vein draining arm.

**Subcutaneous delivery drugs** introduced beneath the skin.

**Subcutaneous fat** Layer of fat beneath the skin.

**Sublingual tablet** Tablets which are designed to be placed under the tongue.

**Substance P** An 11-amino acid polypeptide believed to be important as a neurotransmitter in the pain fibre system.

**Succinic dehydrogenase** An enzyme involved in the Krebs' cycle which converts succinate to fumarate.

**Succus entericus** See intestinal juice.

**Sucrase** Enzyme found in the intestinal juice which splits cane sugar into glucose and fructose.

**Sucrose** Sugar found in sugar cane and sugar beet. Split into glucose and fructose in the small intestine by sucrase.

**Sufentanil** An analgesic opiate analogue.

**Sulphotransferases** Enzymes responsible for sulphonation of xenobiotics in the liver

**Sulphapyridine** A sulphonamide used to treat dermatitis herpetiformis.

**Sulphasalazine** Drug used to treat ulcerative colitis, Crohn's disease and rheumatoid arthritis.

**Sulphomucins** Sulphated mucin.

**Sulphur dioxide** An irritating gas. Used in refrigerators and as a bactericide.

**Sumatriptan** An antimigrane drug.

**Superioris alaeque** Muscle which raises upper lip and flares nostrils.

**Suppository** A semi-solid substance which is used to deliver drug to the rectum, vagina or urethra.

**Surfactant** An agent which lowers surface tension.

**Suspension** Solid particles which are suspended in, but not dissolved in, a liquid.

**Symphysis pubis** Junction of the pubic bones on midline in front.

## T

**T cells** Lymphoid cells from the bone marrow that migrate to the thymus gland, where they develop into mature differentiated lymphocytes that migrate between the blood and lymph. Mature T cells are antigen specific i.e. each responds to different antigens.

**T lymphocytes** See T cells.

**Tachycardia** Abnormal rapid heartbeat.

**Talin** A sweet-tasting protein extracted from *Thaumatococcus danielli*, approximately 100,000 times sweeter than sucrose. Also known as Thaumatin.

**Technetium-99m** ( $^{99m}\text{Tc}$ ) A gamma emitting radioisotope with a half-life of 6 h. Used as a diagnostic agent for diagnostic gamma imaging. It is also used in research to follow

the behaviour of formulations in the body. It can be complexed in many ways e.g. with diethylenetriaminepentaacetic acid (DTPA), hexakis (t-butyl isonitrile), hexamethylpropyleneamine oxidase, HIDA or with tannous phytate.

**Teflon** (polytetrafluorethylene) A white thermoplastic material with a waxy texture. It is non-flammable, resists chemical action and radiation and has a low coefficient of friction.

**Terbutaline** A synthetic sympathomimetic amine used for treating asthma.

**Terpenes** Any member of the family of hydrocarbons with the formula  $\text{C}_{10}\text{H}_{16}$ . There are found in the essential oil of many plants especially conifers.

**Testosterone** Androgen produced by the testes. The hormone is also produced by the adrenal cortex in both males and females.

**Tetracyclines** Broad spectrum antibiotics.

**Tetrahydrozoline** A vasoconstrictor used as a nasal decongestant.

**Theophylline** Bronchodilator drug used for reversible airway constriction.

**Thermogram** A graphic record of variation in the amount of heat required to cause a change in temperature; the heat capacity as a function of temperature.

**Thermophoresis** The movement of small particles toward a warm surface as a result of differences in diffusion rate.

**Thiomersal** An organomercurial used as a pharmaceutical antibacterial and preservative.

**Thrombosis** Formation, development or existence of a blood clot or thrombus. Life-saving during haemorrhage, but life threatening if it occurs at any other time since it can occlude blood supply to a vessel.

**Thymidine** A nucleoside present in deoxyribonucleotide.

**Timolol** A  $\beta$  adrenergic blocking drug.

**Titanium dioxide** Used to protect the skin from the sun.

**Total parenteral nutrition (TPN)** Intravenous nutrition which provides total nourishment to a patient.

**Tragacanth** Dried gum exuded from the plant *Astragalus gummifer*. Used as a mucilage for greaseless lubrication and as an application for chapped skin.

**Transferrin** Blood globulin which binds and transports iron.

**Transfersomes** Liposomes made from a blend of phospholipids which have a high degree of flexibility, allowing them to pass through small gaps in the lipid structure of the epithelium.

**Transition temperature (lipids)** The temperature at which a phospholipid bilayer undergoes a phase transition from an ordered to a disordered state.

**Transitional epithelium** Epithelium which shows a gradation in type at the boundary between different organs, for example between the oesophagus and the stomach.

**Tributyrase** An enzyme which hydrolyses tributyrin to glycerol and butyric acid.

**Triceps muscle** Extends forearm and arm.

**Tricyclic antidepressants** Drugs used to treat moderate to severe endogenous depression.

**Trypsin** Proteolytic enzyme formed in the intestine.

**Trypsinogen** Proenzyme of inactive form of trypsin.

**Tuberculin** A soluble cell substance prepared from the tubercle bacillus used to determine the presence of a tuberculosis infection.

**Tuft cells** An intestinal epithelial cell of uncertain function.

**Turbinates** Bones which project from the lateral nasal wall.

**Tween** Trade name for a family of hydrophilic surfactants produced by conjugating ethylene oxide and fatty acids to a sorbitol nucleus.

**Tyrosine** An amino acid.

## U

**Ulcer** An open sore or lesion of the skin or mucous membrane.

**Ulcerative colitis** Inflammation and ulceration in the colon.

**Urea** The diamine of carbonic acid found in the blood lymph and urine. It is formed in the liver from ammonia derived from amino acids by deamination. It is the main constituent in urine.

**Urobilin** A brown pigment formed from the oxidation of urobilinogen, a decomposition product of bilirubin.

**Uveal tract** The portion of the eye consisting of the iris, ciliary body, and choroid.

**Uvula** Small soft structure hanging from the free edge of the soft palate.

## V

**Vaccines** A suspension of infectious agents or part of them administered for the purpose of establishing resistance to an infection.

**Vagus** The 10<sup>th</sup> cranial nerve. It is a mixed nerve with both motor and sensory functions.

**Valium** Trade name of diazepam.

**Vasoactive intestinal peptide (VIP)** Peptide present in the mucosa of the gastrointestinal tract with the main function of inhibiting gastric function and secretion.

**Vasopressin** Hormone formed in the hypothalamus. It has an antidiuretic effect and pressor effect that elevates blood pressure.

**Vastus** One of three muscles of the thigh.

**Verapamil** Calcium channel blocker used to treat hypertension and angina.

**Villi** Pl. of Villus. Short filamentous processes found on certain cells, generally to increase absorptive area.

**Vinca alkaloids** Drugs such as vincristine and

vinblastine derived from periwinkles. Antineoplastic drugs.

**Virus** A minute organism not visible with ordinary light microscopy. It is parasitic and relies entirely on nutrients in host cells. They consist of a strand of DNA or RNA but not both.

**Viscolyzers** Agents used to enhance the viscosity of solutions or suspensions.

**Viscosity modifiers** See Viscolyzers.

**Vomer** The bone which forms the lower and posterior portion of the nasal septum.

## W

**Wharton's duct** Duct of the submandibular salivary glands opening into the mouth at the side of the frenulum linguae.

**Witepsol** Trade name for a series of surfactants used in some oral dose forms.

## X

**X-ray studies** x-rays are high energy electromagnetic waves varying in length from 0.05 to 100 Å. They can penetrate solid matter to differing degrees and act on photographic film. Hence they are used for diagnosis and therapy. They were used to study the behaviour of drug formulations within the body, but the radioopaque materials adulterated the formulations and the radiation dosimetry limited the number of x-rays which could be taken.

**Xanthines** drugs such as caffeine, theophylline and theobromine which are stimulants and diuretics.

**Xerostomia** Dryness of the mouth caused by reduction in the normal production of saliva.

**Xylan** An anticoagulant polysaccharide similar to heparin.

**Xylometazoline** A vasoconstrictor drug used to treat nasal congestion.

## Z

**Zeta potential** The electrical potential of a charged particle at its hydrodynamic plane. This is similar to the potential at the particle surface but takes into account the fact that the particle normally moves carrying a layer of adsorbed solvent. It is the zeta potential which is calculated from the drift velocity in an electrophoresis experiment.

**Zonulae adherens** See desmosomes.

**Zonulae occludens** See tight junctions.

**Zymogen** A substance that develops into a chemical ferment or enzymes. Zymogen granules are secretory granules of a pre-enzyme substance seen in cells of organs such as salivary glands or the pancreas.

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