

## . Glossary

This glossary is not exhaustive, though I have tried to include any technical term used in the book that might not be immediately familiar to my imagined readership. In some cases I've included relatively familiar words that need more precise definitions in context. **Boldface** within an entry indicates that the word in question is separately defined in the glossary. Acronyms (e.g. GABA) and initialisms (e.g. SSRI) will be found in their proper alphabetical positions. Prefixes and suffixes are hyphenated at the point of attachment, e.g. prefix *a-*, suffix *-ia.*; roots, like *-gluc-/-glyc-* 'sugar' will have hyphens at both ends, to indicate that prefixes and/or suffixes can be attached (*hypo-glyc-aemia*).

**a-** (before a vowel *an-*) negative, not (*a-boulia, an-hedonia*).

**aboulia** Lack of will or desire to act.

**acetylcholine** A major **neurotransmitter**, involved in muscle contraction and the activation of the **parasympathetic** nervous system.

**ACTH** Adreno-cortico-tropic hormone. The chemical signal from the **pituitary** that causes the **adrenals** to release **cortisol** and similar 'stress hormones'.

**adrenaline** Also *epinephrine*. A hormone produced by the **adrenal medulla**, that is part of the stress response.

**adrenals** Two **endocrine** glands situated above the kidneys, that produce **adrenaline** and various **steroid hormones**.

**AED** Anti-epileptic drug (also *anticonvulsant*).

**affect** emotion, state of feeling

**agonist** A chemical that promotes or increases the activity of another by binding to its **receptors**. A substance that decreases the activity of another is an *antagonist*.

**allele** A variant form of a gene.

**alkaloid** an alkaline, nitrogen-containing chemical found in a plant, presumably evolved as a

defense against predators: e.g. atropine, hyoscine.

**amine** An organic (carbon-based) chemical containing an amine group,  $-NH_2$ —i.e. an ammonia molecule ( $NH_3$ ), lacking one hydrogen. Those with only one group are *monoamines*.

**amino acid** An weak organic acid containing a carboxyl group  $-COOH$ . Strings of amino acids form **proteins**.

**amnesia** Loss of memory. This may be *retrograde* (loss of previous memory); or *anterograde* (inability to lay down new memories.)

**amygdala** A structure in the **limbic system** responsible for emotions such as fear and aggressiveness, storage of traumatic memories, and the recognition of faces.

**anergia** Lack of energy.

**anhedonia** The inability to feel enjoyment or pleasure.

**anti-** (**ant-** before a vowel: *anti-histamine*, *ant-acid*). Against, counteracting.

**antagonist** see **agonist**

**anterograde** see **amnesia**

**anti-hypertensive** A drug used for lowering blood-pressure.

**anticholinergic** Acting against **acetylcholine** by binding to its **receptors**. Anticholinergic drugs tend to produce raised blood pressure and pulse-rate, dry mouth, constipation and urinary difficulty.

**antihistamine** An **antagonist** of **histamine**.

**antipsychotic** Also *neuroleptic*. A drug, usually a **dopamine antagonist**, that reduces the symptoms of **psychosis**.

**anxiolytic** A drug that reduces anxiety, lit. ‘dissolves’ it.

**aphasia** Loss of speech.

**ataxia** A movement disorder (permanent or temporary) involving clumsiness and lack of limb control.

**auto-** Self-

**autonomic nervous system** A branch of the nervous system concerned with control of blood-pressure, digestion, and many other functions. It has two branches, the *sympathetic* (activated mainly by **adrenaline** and **noradrenaline**) and the *parasympathetic* (activated mainly by **acetylcholine**). Sympathetic arousal produces the **fight or flight** response (raised blood pressure, etc.); the parasympathetic has the opposite effects.

**axon** The process extending from a neuron that carries information away from it, to a **synapse**.

**BDNF** Brain-derived neurotrophic factor. A **protein** necessary for the maintenance, growth and regrowth of **neurons**.

**benzodiazepine** A class of sedative or tranquillising drugs including Valium and its relatives.

**bipolar** A type of mood disorder in which the patient switches between depressed and elevated mood states. Also *manic depression*.

**blindsight** The unconscious recognition of objects in cases where there is damage to the visual **cortex** but the eyes are intact.

**blockade** Any process that prevents **receptors** from binding the appropriate molecules.

**brain stem** The most 'primitive' or ancient part of the brain, consisting of the medulla (controlling breathing and heartbeat) and other structures just above the spinal cord.

**-cardi-** Pertaining to the heart.

**Capgras delusion** The conviction that partners, relatives or friends are not 'real' but are clever facsimiles inhabited by others.

**catalyst** A substance that promotes a chemical reaction without being changed itself.

**CBT** **Cognitive behavioural therapy**. A type of psychotherapy based on the assumption that

psychiatric disorders are due to ‘erroneous thinking’, and that changes in thought and behaviour can produce improvement or cure.

**cerebellum** An outgrowth of the **brainstem** that controls automatic movement and fine motor coordination, and some aspects of learning.

**-cerebr-** Pertaining to the brain.

**cerebrospinal fluid (CSF)** The lymph-like fluid that surrounds the brain and spinal cord, bringing nutrients and taking away wastes.

**chromosome** A molecule of DNA wrapped around a core of protein, carrying a specific set of genes.

**circadian.** Of bodily rhythms that operate on roughly 24-hour clock, such as the control of hormone secretion, sleep, etc. Other rhythms are *infradian* (less than a day), or *ultradian* (more than a day). The sleep cycle is circadian, blood sugar rhythms are infradian, and the menstrual cycle is ultradian.

**CNS** Central nervous system (brain and spinal cord).

**comorbid** Of a disease occurring with another.

**confabulation** The unintentional invention of stories to substitute for absent or unwanted memories.

**cortex** The outer layer of a multilayered organ; in the brain, the evolutionarily newest and topmost layer. In discussing the brain *cortex* and the adjective **cortical** normally refer to the **neocortex**.

**cortical** Referring to the cerebral cortex, more broadly to the ‘higher’ cognitive functions, as opposed to *subcortical*. The **limbic system** and **brain stem** are subcortical structures.

**cortisol** A **steroid hormone** produced by the **cortex** of the **adrenal** gland, involved in stress-response.

**Cotard delusion** The conviction that one is dead.

**CRH** Corticotrophin Releasing Hormone, a **hormone** that ultimately causes the release of **cortisol**, as well as having other effects in the brain.

**cyclo-** Circular, cyclic.

**cyclothymia** Rapidly changing mood states; a mild form of **bipolar** disorder.

**delusion** An erroneous belief, (e.g. that the CIA is monitoring your thoughts through your radio, or that you have been abducted by aliens).

**dendrite** A branch-like tubular fatty structure coming off the cell body of a **neuron**, that connects with other dendrites or the terminal buttons of **axons**.

**diathesis** A hereditary predisposition to an illness.

**dissociation** A condition in which parts of the self or personality appear to some degree 'separate' entities.

**DNA** Deoxyribonucleic acid, the substance in which the genetic code is written.

**dopamine** An **amine neurotransmitter** controlling arousal, initiation of movement, aspects of memory and reward, and sensations of pleasure.

**Doppelgänger.** A 'duplicate' self that appears to follow one around, or is met face-to-face.

**dorsal** Referring to the back surface (of the body or an organ).

**down-regulation** Decrease in the number of **receptors** for a particular substance, due to an increase in supply. The opposite is *up-regulation*, in which receptor numbers increase as the supply decreases.

**DSM** The *Diagnostic and statistical manual of mental disorders*, published by the American Psychiatric Society.

**dualism** The belief that 'mind' and 'body' or 'brain' are separate; normally that the mind is non-material whereas the brain is 'merely' material, and therefore cannot be capable of thought or consciousness in itself.

**dys-** negative version of what follows .

**dysphoria** low mood.

**dysthymia** A general state of low mood bordering on serious depression

**ECT** Electroconvulsive therapy. The induction of seizures under controlled conditions for the treatment of depression and other psychiatric diseases.

**EEG** Electroencephalogram. The output of a device that measures the electrical activity of the brain non-invasively through the scalp.

**-emia-, -aemia-** Condition involving the blood (e.g. *hypo-glyc-emia* 'low blood sugar').

**en-** In.

**endo-** In(side of).

**endocrine** Of a gland that secretes its product directly into the bloodstream rather than through a duct (e.g. the **thyroid** or **pituitary**).

**endorphin** A morphine-like substance produced in the brain, controlling pain and sometimes producing euphoria (as in the 'runner's high').

**enzyme** A **protein** that acts as a **catalyst** in reactions inside the body.

**epinephrine** see **adrenaline**

**-ergic** Activated by or utilizing a particular neurotransmitter, as in *serotonergic, dopaminergic*, etc

**eu-** Good, healthy.

**euthymia** 'Normal' or 'good' mood.

**excitatory** see **inhibitory**

**exo-** Out(side of).

**exogenous** Originating from outside (the mind or body).

**expression** The production of **protein** by a gene.

**extra-** Out(side of).

**fight or flight response** The result of activation of the **HPA**. Involves raising of pulse-rate and blood-pressure, release of insulin and **adrenaline**, turning off of sexual and excretory systems.

**firing** The production of an electrical current ('action potential') in a **neuron**.

**frontal lobe** The anterior lobe of the **neocortex**, situated roughly behind the eyes and forehead, the site of most 'higher' cognitive function.

**GABA** Gamma-aminobutyric acid, an important **inhibitory neurotransmitter**.

**gamete** A sex cell (sperm or ovum), with only half the species complement of **chromosomes**.

**-gen-** Generate, give birth, produce (e.g. *endo-gen-ous* 'produced from inside').

**genome** The full set of genes possessed by any organism; its 'genetic definition'.

**genotype** The genetic constitution of an individual (including those genes that are not **expressed**), as opposed to its *phenotype*, its physical appearance or behaviour.

**-gluc-/ -glyc-** Pertaining to sugar.

**glucose** A simple sugar, the body's main source of energy.

**glutamate** The main **excitatory neurotransmitter** in the brain..

**glutamine** An **amino acid** playing an important role in the nervous system, possibly involved in bipolar disorder and certainly in Huntington's disease.

**glycogen** The insoluble form (a starch) in which **glucose** is stored in the liver and other parts of the body, prior to release into the bloodstream.

**hallucination** A sensory experience with no external input, but generated from the brain itself: normally visual or auditory, but can sometimes be olfactory as well.

**hemi-**, half-

**hemiplegia** Paralysis on one side of the body.

**hetero-** different from.

**heterozygotic** Of a pair of twins from different fertilisations, hence genetically no more alike than any arbitrary pair of siblings ('fraternal' twins); as opposed to *homozygotic* twins, from the splitting of one **zygote** ('identical' twins).

**heterozygous** Having two different **alleles** of the same gene. If both maternal and paternal alleles are the same, the organism is *homozygous* for that particular gene.

**hippocampus** A structure in the limbic system primarily concerned with the establishment of memory and maintenance of mood.

**Histamine** An **amine** involved in inflammatory and allergic processes among others; **antagonists** at certain histamine **receptors** can cause somnolence and/or weight gain.

**homozygotic** see **heterozygotic**

**homozygous** see **heterozygous**

**hormone** A substance (most often a **steroid** or **peptide**) that sends chemical messages from one part of the body to another, or activates physiological processes: e.g. cortisol, testosterone, oestrogen.

**HPA** The hypothalamic-pituitary-adrenal axis. A system which, under stress, is responsible for setting the '**fight or flight**' reaction in train, and inducing the release of **adrenaline** and **cortisol**.

**Huntington's disease** A hereditary neurological disease causing movement disorder, dementia and death.

**hyper-** More than/above normal.

**hyperthymia** Slightly elevated mood.

**hypersomnia** Excessive sleep.

**hypnotic** A drug designed to aid sleep, a 'sleeping pill'.

**hypo-** Less than/below normal.

**hypomania** A state of elevated mood, not quite reaching **mania**.

**hypothalamus** A structure in the **limbic system** below the **thalamus**, concerned with 'housekeeping' tasks (maintaining blood sugar levels, etc.), sexual arousal, and response to stress.

**hypothymia** Slightly lowered mood.

**-ia** Indicating a state or condition.

**in vitro** Of an experiment or phenomenon occurring outside a living organism.

**in vivo** Of an experiment or phenomenon occurring inside a living organism.

**infradian** see **circadian**

**inhibitory** Of a chemical or neural circuit that acts to prevent or decrease the **firing** of **neurons**; the opposite type of action is *excitatory*.

**labile** Fluctuating, unstable.

**lateralisation** Specialisation of function to one cerebral hemisphere.

**limbic system** The 'old mammalian' brain, those subcortical structures primarily concerned with emotion and life-sustaining processes

**lipid** Fatty substance, e.g. cholesterol.

**mania** A state of extremely elevated mood, verging on or reaching the **psychotic**.

**MAOI** Monoamine Oxidase Inhibitor; an antidepressant drug that disables **monoamine oxidase**.

**medulla** The inner core of a multilayered organ. See **cortex**.

**mixed state** A mood episode which simultaneously shows both manic and depressive features.

**monoamine** see **amine**

**monoamine oxidase** A class of enzymes that degrade **monoamine neurotransmitters**.

**mood stabiliser** A drug such as lithium carbonate that reduces or prevents cycling between manic and depressed states.

**MPD** Multiple personality disorder. A controversial kind of **dissociation**, in which the patient appears to have 'multiple personalities' or as they're often called 'alters', which behave as if they were independent persons. It is not known whether this is a real illness or a therapist-generated artifact.

**myelin** A fatty substance wrapped around the **axons** of most nerves, speeding the conduction of current.

**neocortex** the evolutionarily most recent part of the mammalian brain, the outer convoluted layer.

**neuroleptic** see **antipsychotic**

**neuron** A specialised nervous system cell that transmits information by means of electrical current and release of **neurotransmitters**.

**neurogenesis** The growth or replacement of **neurons**.

**neurotransmitter** Broadly, any substance that activates, inhibits or conveys information to a **neuron**.

**noradrenaline** An **amine neurotransmitter**, related to **adrenaline**, differing only in having one methyl group (-CH<sub>3</sub>) instead of two. (This was once thought to be the 'normal' form of such compounds, hence *nor-*). Also *norepinephrine*.

**norepinephrine** see **noradrenaline**

**nucleus accumbens** A small structure in the **limbic system**, richly supplied by **dopamine** neurons. It is one of centres for 'reward' and the sensation of pleasure.

**occipital lobe** The hindmost lobe of the **neocortex**, concerned primarily with vision.

**ontogenetic** Pertaining to the origin and development of an individual (e.g. fetal or embryonic growth).

**opiate** A drug made from, or containing or chemically and physiologically similar to opium.

**opioid** An opium-like substance, usually one made by the body itself

**panic attack** A very severe form of acute anxiety, involving palpitations, hyperventilation, and frequently fear of death.

**parasympathetic nervous system** see **autonomic nervous system**

**parietal lobe** The lobe of the **cerebral cortex** posterior to the **frontal**, above the **temporal**, and anterior to the **occipital** lobe.

**Parkinsonism** A movement disorder produced by degeneration of certain **dopamine neurons**, characterised by stiffness, inability to initiate or stop movement, and tremor.

**-path-** Pertaining to a diseased state.

**peptide** A small **protein**, consisting of a short chain of **amino acids**.

**perfusion** The supply of blood to a given part of the body.

**-phor-** relating to state of mind, as in eu-phoria.

**-phren-** Pertaining to thought or general cognitive function.

**piloerection** The erection of hairs, as in 'hair standing up on the back of your neck', or on balder parts of the body 'goose-bumps'.

**phenotype** see **genotype**

**phylogenetic** Pertaining to the evolutionary history of a species or other grouping.

**pineal gland/body** A glandular object in the midline of the brain, above the **hypothalamus**. Concerned with reacting to light and organising **circadian** rhythms.

**pituitary** or *hypophysis*. A portion of the lower **hypothalamus**, often referred to as an **endocrine** gland, but actually part of the brain.

**polarity** The 'upness' or 'downness' of mood; e.g. depression vs. **mania**.

**polymorphism** A variation at some locus in a gene in members of a population.

**postsynaptic** Of a **neuron** that is downstream of a **synapse** and receives **neurotransmitters** from it.

**presynaptic** Of a **neuron** that is upstream of a **synapse** and discharges **neurotransmitters** into it.

**projection** A single **neuron** or bundle constituting a functional pathway, originating in one part of the brain and ending up in another.

**protein** The basic material that living things are made of. Proteins are chains of **amino acids** of varying lengths and three-dimensional structures.

**proximate cause** The cause in a chain of causes closest to the effect.

**-psych-** Pertaining to the mind.

**psychomotor** Pertaining to (both) mental and physical behaviour, normally its speed (hence *psychomotor retardation*, etc.)

**psychosis** (Adj *psychotic*) Loosely (and with diagnostic tact), a state in which a person is disconnected from 'consensual reality', normally through having **hallucinations**, **delusions** or both.

**psychotropic** Of a drug or other substance acting on the mind.

**PTSD** or **Postrumatic stress disorder** A condition following severe stress or trauma (e.g. rape, witnessing atrocities), characterised by 'flashbacks' of the original scene, hypervigilance, often aggressiveness, fear, depression and proneness to violence and nightmares.

**receptor** A protein structure, part of which protrudes from the outer membrane of a cell, and part of which pierces the membrane and enters the interior. Receptors are specifically designed to accept molecules of a certain shape, and communicate a specific message to the interior of the cell, or in

some cases to allow substances directly into the cell.

**REM** Rapid eye-movement sleep. The stage in sleep when the body muscles are largely paralysed and the eyes move rapidly beneath the closed eyelids. This is when most dreaming occurs.

**retrograde** see **amnesia**

**reuptake** The reabsorption of a **neurotransmitter** from the **synapse** into the **neuron** that has released it. Many antidepressants work by inhibiting this process. The machinery for this process is often called the *reuptake pump*.

**SAD** Seasonal affective disorder. A mood disorder that responds to the seasons, specifically to light.

**schizophrenia** A complex **psychotic** disorder or group of disorders involving clusters of ‘negative’ symptoms (withdrawal, depression) and ‘positive’ ones (hallucination, delusion, mania), and a general ‘splitting’ of the patient from the usual everyday world. Not as usually thought ‘split personality’.

**serotonin** An **amine neurotransmitter**, implicated in the maintenance of mood as well as other functions, and the primary target of most antidepressants.

**SNRI** **Serotonin** and **noradrenaline reuptake** inhibitor. A class of antidepressants including Effexor.

**somatic** Referring to the body.

**spectrum** A ‘range’ or ‘scale’ along which various forms of a condition can be placed, without sharp distinctions between positions: e.g. the depression spectrum, the autism spectrum.

**SSRI** Selective **serotonin reuptake** inhibitor. A class of antidepressants including Prozac.

**steroid** A fatty organic compound built around a structure of seventeen carbon atoms in four interlocking rings. Among the most biologically important are cholesterol, testosterone, and **cortisol**. Synthetic steroids like cortisone, etc. are used as anti-inflammatory and immunosuppressive agents.

**subcortical** Generally referring to structures below (and older than) the **neocortex**, e.g. the **limbic system**.

**sympathetic nervous system** see **autonomic nervous system**

**synapse** The meeting-point of the **axon** of one **neuron** with the **dendrites** of another, or with a muscle or other structure; the junction across which information is signalled from one neuron to another.

**tachycardia** Excessively rapid heartbeat.

**TCA** see **tricyclic**

**temporal lobe** The lobe of the **neocortex** immediately behind and below the **frontal** lobe, concerned with memory, hearing, religiosity and aspects of language function.

**thalamus** A structure in the **limbic system** that acts as a kind of 'way station' or transducer for sensory input, as well as being involved in memory.

**-thym-** mood.

**thyroid** An **endocrine** gland situated in front of the larynx, which controls many aspects of energy use and metabolism, and also affects mood.

**Tourette's syndrome** A dysregulation of the **dopamine** system presenting as tics, twitching, barking and making other strange noises, and uncontrollable obscenity.

**transporter proteins** Protein molecules that bind to **neurotransmitters** and take them back into the **neuron** that has released them, i.e. the mechanical agents of **reuptake**.

**tricyclic** A class of antidepressants so called because of their three-ring molecular structure.

**-tropic** Affecting the item that comes before it.

**ultimate cause** The first in a chain of causes leading to an effect.

**ultradian** see **circadian**

**unipolar** Of a depressive disorder having only one polarity, i.e. alternations between 'normal' mood

and depression.

**up-regulation** see **down-regulation**

**ventral** Pertaining to the lower side of the body or an organ.

**ventral tegmental area** An area in the **limbic system** that is stimulated by **dopamine**, part of the brain's 'pleasure system'.

**white matter** the collective name for the substance in the brain composed of the **axons** of **neurons** coated with **myelin**.

**zygote** A fertilised ovum, containing full chromosome complements from both parental **gametes**. This term applies only before the first cell-division, after which it becomes an embryo.