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Regeneron Ex. 2055
Alvotech v. Regeneron
PGR2025-00085
Page 1 of 3

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protein 3-$\alpha$-galactosyltransferase; *other name*: [histo-blood group] B transferase; an enzyme that catalyses the reaction:

UDPgalactose + glycoprotein $\alpha$-L-fucosyl-(1,2)-D-galactose = UDP + glycoprotein $\alpha$-D-galactosyl-(1,3)-[$\alpha$-L-fucosyl-(1,2)]-L-galactose,

thus adding galactose to the H antigen of the **ABH antigen** system, leading to formation of the B antigen. The protein is a product of one allele of the *ABO* gene. It has virtual identity of sequence with that catalysing **A-transferase** activity, differing only at residues 176 (A has Arg, B has Gly), 235 (A Gly, B Ser), 266 (A Leu, B Met), and 268 (A Gly, B Ala). Database code BGAT_HUMAN, 354 amino acids (40.89 kDa).

**Btu** *abbr. for* British thermal unit.

**Bu** *symbol for* the butyl group.

**BU** *(sometimes) abbr. for* bromouracil (BrUra is recommended).

**bubble column** a column-shaped bioreactor in which the reaction medium is kept mixed and aerated by the introduction of air at the bottom.

**Büchner, Eduard** (1860–1917), German chemist and biochemist renowned for his seminal discovery that alcoholic fermentation could be initiated with a cell-free press juice from brewers' yeast, the active principle of which he considered to be a protein denoted zymase; Nobel Laureate in Chemistry (1907) 'for his biochemical researches and his discovery of cell-free fermentation'.

**Büchner funnel** a cylindrical funnel for filtration, usually of porcelain or plastic, that includes a perforated plate on which a filter paper is placed. It is generally used with a vacuum. *See also* **Hartley filter funnel**.

**bud** **1** a small lateral or terminal protuberance on the stem of a plant that contains undeveloped foliage or floral leaves. **2** a budlike protuberance on the surface of a yeast cell or other simple organism. **3** to form a bud. **4** to reproduce asexually, as in yeasts, by the process of **budding**.

**Buddha** suite of computer programs for structure refinement and energy minimization.

**budding** **1** the production of a bud or buds. **2** a form of asexual reproduction, occurring in certain bacteria and fungi (e.g. yeasts) and some primitive animals in which an individual arises from a daughter cell formed by pinching off a part of the parent cell. The budlike outgrowths so formed may sometimes remain attached to the parent cell.

**BUdR** *or* **BUDR** *(sometimes) abbr. for* bromodeoxyuridine (the symbol BrdUrd is preferred).

**bufadienolide** any of various naturally occurring doubly unsaturated lactones of certain steroids with important pharmacological effects on heart muscle (*see* **cardiac glycoside**). They are so named because they were originally found in the venomous secretion of the skin glands of some toads (*Bufo*), and are hence also known as **toad poisons**. They also occur in certain plants, e.g. *Digitalis*. *See also* **bufogenin B**.

**buffer** **1** any substance or mixture of substances that, when dissolved (usually in water), will maintain its solution at approximately constant pH despite small additions of acid or base. The commonest examples are moderately strong solutions containing both a weak acid and its conjugate base (or a weak base and its conjugate acid). A substance is useful as a buffer over a range of about one pH unit either side of its p$K$, but is most effective at or near the p$K$. Buffer substances used for biochemical or biological purposes include: acetate, bicarbonate, bis-tris propane, borate, citrate, dimethylmalonate, glycinamide, glycylglycine, imidazole, phosphate, succinate, and **Tris** together with any **Good buffer substances**. By extension, the term may be applied to agents controlling the activities of various other specified entities, e.g. redox buffer, carbon-dioxide buffer, metal-ion buffer. Also used attributively: e.g. buffer action; buffer salt; buffer solution. **2** a solution of a **buffer** (def. 1). **3** a short-term storage facility (e.g. as part of the memory of a computer), especially one whose patterns or rates of input and output can differ. **4** to treat with or to incorporate a buffer (def. 1); to act as a buffer. *See also* **buffering capacity**, **buffer value**. —**buffered** *adj.*; **buffering** *n.*

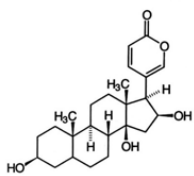
**buffering capacity** *or* **buffering power** **1** the number of gram-equivalents of either hydrogen ions or hydroxide ions required to change the pH of 1 litre of 1 M buffer solution by one unit. Buffering capacity = (1/$m$) (d$n$/dpH), where $m$ is the number of moles of buffer, and dpH is the pH change produced by addition of d$n$ equivalents of hydrogen ions or hydroxide ions. **2** *an alternative term for* **buffer value**.

**buffer solution** *see* **buffer** (def. 2).

**buffer value** *or* **Van Slyke buffer value** *or* **buffering capacity** *symbol*: $\beta$; the amount of acid or base, in gram-equivalents, needed to change the pH of 1 litre of a buffer solution by one unit at any pH; i.e. $\beta$ = $db$/dpH, where $b$ is the molar concentration of base in the solution. [After Donald Dexter Van Slyke (1883–1971), US biochemist, who described it in 1922.]

**buffy coat** the layer of white cells that forms between the layer of red cells and the plasma when unclotted blood is centrifuged or allowed to stand.

**bufogenin B** 3$\beta$,14,16$\beta$-trihydroxy-5$\beta$-bufa-20,22-dienolide; a **bufadienolide** found in the Chinese drug Ch'an Su, prepared from Chinese toads (*Bufo asiaticus*).




**bulge loop** a structure in a polynucleotide duplex in which one strand contains a nonterminal extra sequence that is not able to base-pair with the second strand, thereby forming a bulge on one side of the duplex.

**BUN** *abbr. for* blood urea nitrogen, an index of the blood-urea concentration.

**bundle sheath** a parenchymal sheath surrounding a vascular bundle in plants.

**bungarotoxin** any of various neurotoxins derived from the venom of the elapid snake, *Bungarus multicinctus*. The chief components are: (1) $\alpha$ bungarotoxin, a single polypeptide chain of 74 amino-acid residues; it is an irreversible antagonist of nicotinic cholinergic receptors and causes paralysis; (2) $\beta$ bungarotoxin, a multicomponent protein composed of two polypeptide chains: a long chain (120 amino-acid residues) and a short chain (60 residues); it prevents the release of acetylcholine from cholinergic neurons.

**Bunsen coefficient** *symbol*: $\alpha$; the absorption coefficient of a gas in a solution. It is defined as the volume of gas in litres, reduced to 273.15 K and 1 atm (101 325 Pa) pressure, that dissolves in 1 litre of liquid when the partial pressure of the gas in the gas phase is 1 atm. [After Robert Wilhelm Bunsen (1811–99), German chemist.]

**bunyavirus** any of a group of RNA animal viruses consisting of enveloped particles, 90–100 nm in diameter with helical nucleocapsids, and containing segmented RNA (minus strand) of 3–4 MDa. The group has been recognized as different from **togaviruses** and includes arthropod-borne viruses that can cause encephalitis.

**buoyant density** the density of a solute molecule as determined by density-gradient ultracentrifugation. It is the density of the solution, $\rho$, at the point in the gradient where: $\rho = 1/\gamma$, where $\gamma$ is the **partial specific volume** of the solute in question.

Regeneron Ex. 2055
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PGR2025-00085
Page 3 of 3