

A Dictionary of

GENERALIS

Seventh Edition

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tants replace healthy genes, the good ones never come back and so the process resembles a ratchet wheel, which moves in only one direction. Muller proposed that sexuality arose because it allowed crossing over to occur between homologous chromosomes from parents carrying different mutants. Recombinant offspring with mutant-free genomes could thus arise and halt the action of the ratchet. The term *Muller ratchet* was coined by J. Felsenstein in 1974.

multifactorial polygenic.

multiforked chromosome a bacterial chromosome containing more than one replication fork, due to the initiation of a second fork before completion of the first replication cycle.

multigene family a set of genes descended by duplication and variation from some ancestral gene. Such genes may be clustered together on the same chromosome or dispersed on different chromosomes. Examples of multigene families include those that encode the histones, hemoglobins, immunoglobulins, histocompatibility antigens, actins, tubulins, keratins, collagens, heat shock proteins, salivary glue proteins, chorion proteins, cuticle proteins, yolk proteins, and phaseolins. *See* isoforms, reiterated genes.

multimer a protein molecule made up of two or more polypeptide chains, each referred to as a monomer. The terms dimer, trimer, tetramer, pentamer, etc., are used if the number of monomers per multimer is known. *Compare with* monomer, oligomer, polymer.

multiparous bearing or producing more than one offspring at a birth. *See* parity.

multiple allelism *See* allele.

multiple choice mating referring to an experimental design in studies of behavior genetics where a test organism is allowed to choose between two (or more) genetically different mates.

multiple codon recognition *See* wobble hypothesis.

multiple-event curve a curve (relating relative survival to radiation dose) that contains an initial flat portion. This finding indicates that there is little biological effect until a certain dose has accumulated, and suggests that the sensitive target must be hit more than once (or that there must be multiple targets, each of which must be destroyed) to produce a biologically measurable effect. *See* single-event curve, target theory.

multiple factor hypothesis *See* quantitative inheritance.

multiple genes *See* multiple factor hypothesis, polygene, quantitative inheritance.

multiple infection simultaneous invasion of a bacterial cell by more than one phage, often of different genotypes in experiments designed to promote phage recombination; superinfection.

multiple myeloma *See* myeloma.

multiple neurofibromatosis *See* neurofibromatosis.

multiple transmembrane domain proteins protein molecules that contain several segments that lie embedded in the cell membrane. These domains are connected by segments alternately at the cytoplasmic and extracellular surfaces. Rhodopsin (*q.v.*) and the cystic fibrosis transmembrane-conductance regulator are examples of multiple transmembrane domain proteins. *See* cystic fibrosis, opsin.

multiplex PCR a type of polymerase chain reaction (*q.v.*) that is used to sample various regions of a large gene from one end to the other. For example, to analyze the human dystrophin gene, which occupies over 2 million base pairs on the X chromosome, multiplex PCR might involve simultaneous amplification from nine different sets of primers, all within the same reaction test tube. Each set of primers is chosen to produce a different-sized amplification product from a different region of the dystrophin gene. Normal males will display nine characteristic bands after the amplification products are separated by gel electrophoresis. Males with deletions in the dystrophin gene will be missing one or more of these bands. *See* muscular dystrophy.

multiplicity of infection the average number of phages that infect a bacterium in a specific experiment. The fraction of bacteria infected with 0, 1, 2, 3, . . . , n phage follows a Poisson distribution.

multiplicity reactivation the production of recombinant virus progeny following the simultaneous infection of each host cell by two or more virus particles, all of which are incapable of multiplying because they carry lethal mutations induced by exposure to a mutagen.

multipolar spindle a spindle with several poles found in cells with multiple centrioles. Such cells are seen infrequently, but they can be produced in large numbers by irradiation. *See* mitotic apparatus.