Glossary

Autoradiography (as applied to cells):

Detection of radioisotopes incorporated into cells by overlaying with a photographic emulsion; radioactive decay causes silver grains to form which are revealed by photographic processing. This procedure can be used to measure the amount of radioisotope incorporated and/or the location of the radioisotope within the cell. See *pulse labelling*.

Cell cycle, DNA replication and mitosis.

The cell cycle comprises four phases: G1, S, G2 and mitosis (M phase or nuclear division). Cells start out in G1 with a single copy of the nuclear DNA (1c DNA content for a haploid cell). The DNA is duplicated during S phase. This is followed by G2, where cells have 2c DNA. G2 leads up to mitosis where the chromosomes are split and partitioned into two daughter nuclei. In *S. pombe*, mitosis is followed by septum formation and subsequent cell division.

Cell cycle (*cdc*) mutant:

A mutant strain of an organism in which a gene required for cell cycle progress is mutated in such a way as to impair the function of its product. Because most such genes are essential for viability, the mutations generally used are conditional – that is, expressed under one set of conditions but not another. The most common conditionality is temperature-sensitivity, where the gene product is functional at one temperature but defective at another (usually higher) temperature.

Specific *S. pombe cdc* genes referred to in this article are:

- *cdc2*: required for "start" in G1 and the G2-mitosis transition
- *cdc10*: required for "start" in G1
- *cdc11*: required for septum formation (and therefore cell division); the core DNA replication-mitosis cycle continues leading to multinucleate cells
- *wee1*: a gene involved in regulating the G2-mitosis transition; mutants show reduced size and a delay to DNA replication.

Elutriation:

This procedure allows cells to be size-separated in a special centrifuge cell that allows growth medium to be pumped up from the bottom while centrifugal force is applied, pushing the cells downwards. The counterflow gives a good separation of small cells that can be grown on synchronously. Cells remain immersed in normal growth medium throughout, thereby avoiding high cell density and high sugar concentrations. For details, see Creanor J, Mitchison JM (1979) Journal of General Microbiology 112:385-88.

Oscillator & Entrainment:

A mechanism for generating a signal for a cellular process to start or finish at regular intervals. One such oscillator drives the cell division cycle itself, by which cells pass progressively through G1, S, G2 and mitotic (M) phases. Cells may contain other oscillators controlling other processes, and it has been suggested that this type of oscillator may normally be coupled or entrained to the cell division cycle, but this entrainment can be lost when cell division cycle progress is blocked. In this situation the oscillators are said to "free run" and can show a different periodicity from normal.

Pulse Labelling:

A procedure for estimating the rate of synthesis of a cellular component by supplying cells with a (usually radioactively) labelled precursor for a short period, followed by measuring the extent of precursor incorporation within cells. See *autoradiography* for application to single cells.