

Microscopically Characterizing Cells

Artifacts: Not a cell, but other object(s) that can be possibly confused for a cell. Sources include:

1. Cell culture plastic (especially if dirty)
2. Debris (bigger or smaller than cells.) Note that Brownian movement can make particle appear to be alive as it is moving.

Morphology: Learn to anticipate the shape of the given cell line and look for things out of the ordinary.

Fibroblastic cells: (Used to propagate viruses.) Long cells that are attached to substrate.

Epitheloid cells: Used in tissue culture (cultured skin cells for grafting.) Polygonal and attached to substrate.

Lymphoid cells: Used for monoclonal antibody production: Round, in suspension, and highly refractive (appear to shimmer or glow.)

Cells that form a sheet will eventually abut against one another in a condition known as confluency. Cells like this are in a resting state, and can survive for some time, but will need to be propagated soon.

All cells are best viewed with phase contrast tissue microscope. Phase contrast permits best image, and the tissue scope configuration is one with the objective below the specimen and the light source above.

Morphology is somewhat predictable, but be aware that this can change significantly between individual cells, cell lines, growth phase and other factors.

Multinucleated cells: Occurs upon fusion of two cells. May be perfectly normal, or sign of viral infection (function of cell line.)

Single cell embryo: (biggest of the cells, up to 1-2 mm.) Can be individually manipulated, and are often used in genetic studies (e.g. genotyping of developing embryo.)

Size: Can be determined by mixing in spheres of latex of known size...but may be problematic.) Preferred method is to use micrometer in the ocular lens and know the field of view of the magnification.

Growth pattern: Can be suspension, matrix, uniform, sheets or colonies.

Cellular Differentiation: Can be seen via diffraction or +/- of organelles.

Confluency (growth rate factor in attached cells): Determined by the percent coverage of the cell growing surface. Takes some time to learn, and must understand idiosyncrasies of given cell line. Note percentage confluency determination techniques....