



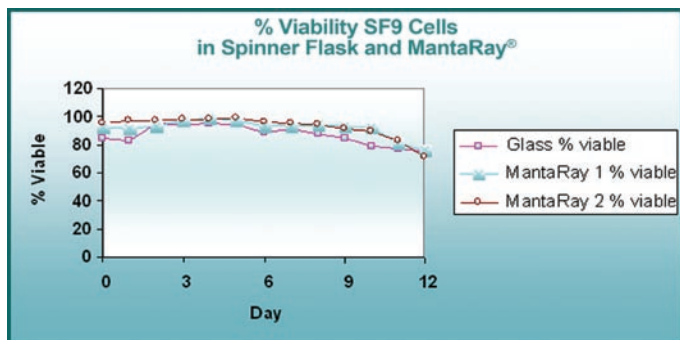
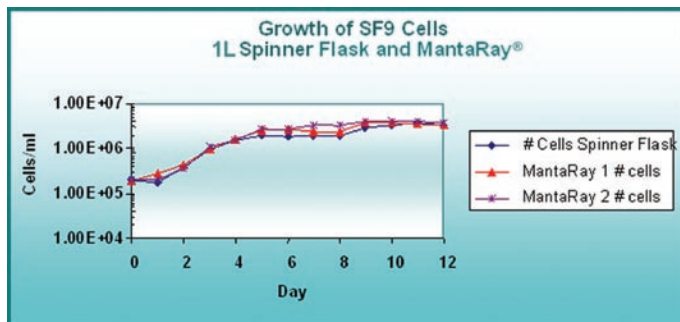
Growing Insect and Mammalian Cells with MantaRay® Single Use Cell Culture Flask

Abstract

The MantaRay® is a new and unique cell culture flask for insect and mammalian cells. The flask shows equivalent growth to conventional spinner flasks for both insect and mammalian cells, having been tested on CHO, HeLa, SF-9 cells, 293, and Burkitts lymphoma cells. Data is presented for SF-9 and HeLa cells.

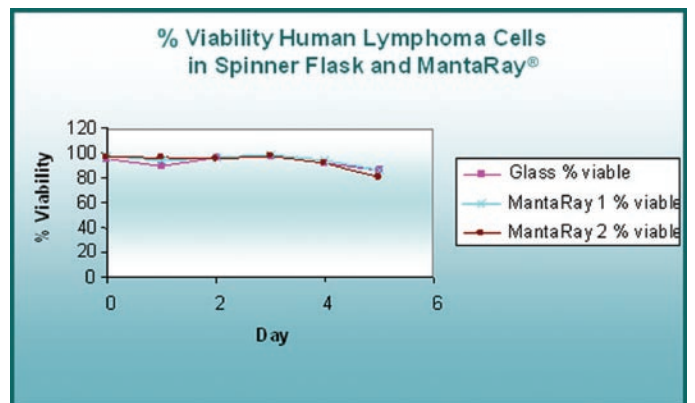
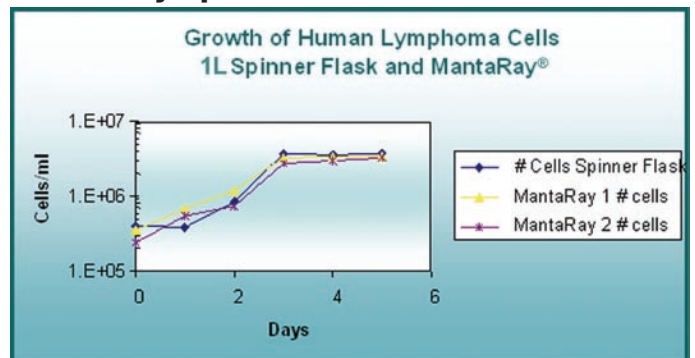
Experimental

SF9 Cells



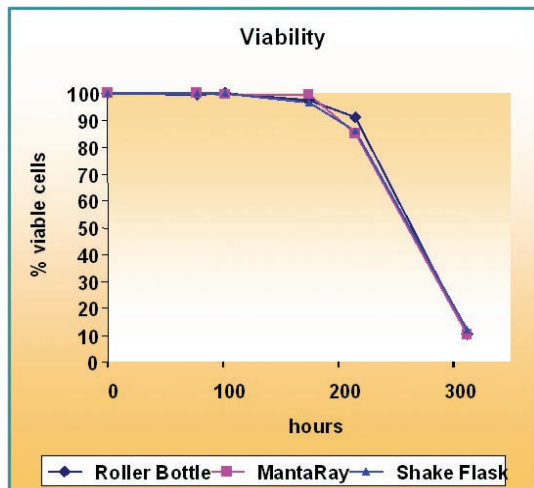
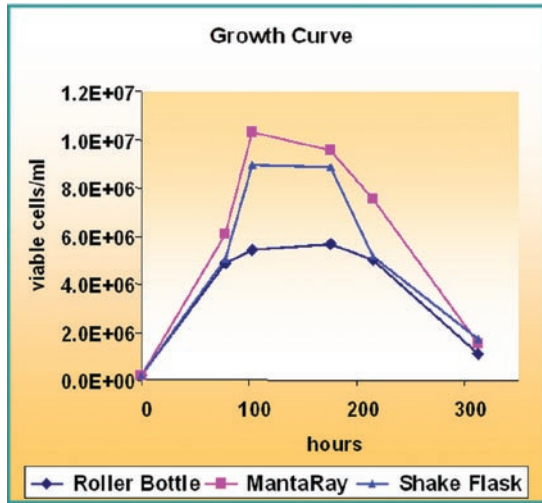
1 ml SF-9 seed was planted in 100 mL media (supplemented with 50 µg/ml gentamycin) in a 250 mL spinner flask and allowed to grow at 27°C (80 RPM). When the cell density was greater than 10⁶ cells/ml, the culture was split to 600 mL in a one-liter spinner flask. The spinner flask was arranged so as to continuously feed fresh 0.2 µm filtered air into the headspace using an air pump, stirring at 80 RPM. When the cell count again reached greater than 10⁶ cells/mL, the culture was split 1:5 by transferring 200 mL culture to 800 mL media that was already temperature equilibrated in two 1 liter MantaRay® flasks and a single 1 liter glass spinner. The three spinners were attached to the air pump via a manifold intended to distribute the air to the headspace of the spinner flasks. Cell count and viability was determined daily using a hemacytometer and trypan blue staining. The cultures were terminated when the viability dropped below 80%.

Burkitts Lymphoma



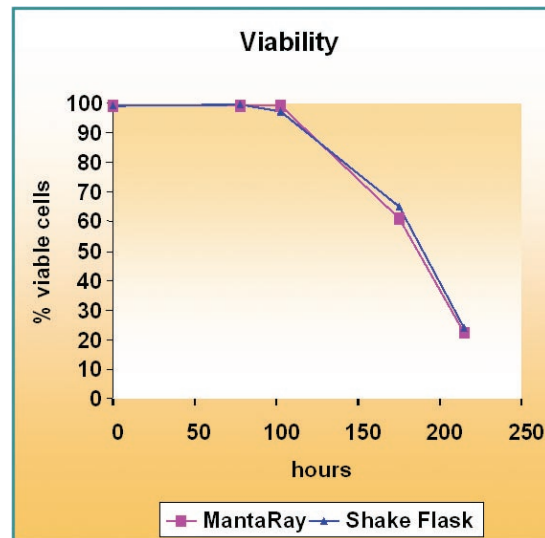
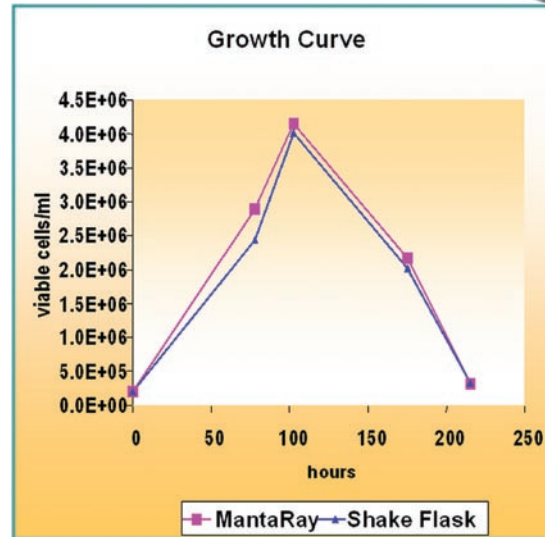
1 mL Burkitts Lymphoma seed was propagated in RPMI 1640 (supplemented with 10% Fetal Calf Serum and 50 µg/ml gentamycin) at 37°C, 5% CO₂ and 80 RPM. It was sequentially split to a volume of 600 mL at which time it was split to the two MantaRay® flasks and one glass spinner as detailed above. The three spinners were attached to the air pump (which was placed inside a 5% CO₂ environment) via a manifold intended to distribute the CO₂/air to the headspace of the spinner flasks. Cell count and viability was determined daily using a hemacytometer and trypan blue staining. The cultures were terminated when the viability dropped below 80%.

CHO



CHO-S from Gibco/Invitrogen was used, grown in serum free media from Gibco. These cells are routinely grown in shake flasks at 125 RPM, 37°C, 8% CO₂ which is very close to the suppliers instructions. The cells were passaged by diluting them to 2e+5 cells/mL twice a week. The cultures were seeded into both the MantaRay® and a parallel shake flask. A small aquarium pump was used to force incubator air into one of the ports on the top (using a 0.22 µm filter). The other port was used as a vent with a 0.22 µm filter.

HEK 293



FreeStyle 293 from Gibco/Invitrogen was grown in serum free media, also from Gibco. The initial culture was grown in shake flasks at 125 RPM, 37°C, 8% CO₂. The cells were passaged by diluting them to 2e+5 cells/mL twice a week. The cultures were then seeded into both the MantaRay® and a parallel shake flask. A small aquarium pump was used to force incubator air into one of the ports on the top (using a 0.22 µm filter). The other port was used as a vent with a 0.22 µm filter.

Results

The MantaRay® showed similar or superior growth and cell viability compared to standard spinner flasks. The MantaRay® shows equal growth compared to standard glass spinner flasks for both HeLa and SF-9 cells. The MantaRay® has also demonstrated excellent results for CHO, 293, and Burkitts lymphoma cells. The MantaRay® has the advantages of being ready for use out of the package, as it is gamma sterilized and comes complete with a magnet. The MantaRay® is unbreakable, and since it doesn't require cleaning, saves time and effort in the lab. The unique stirrer provides gentle, efficient mixing, while reducing stress to cells.