428h Patterns of Colonization and Growth of Mammalian Cells Cultured in Rotating Discs

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Tissue Engineering is a hot research area nowadays. Particularly, the study of strategies to better control the orientation of growth of mammalian cells into tissues is a theme of active research. In this communication, we investigate the patterns of colonization and growth of two types of anchorage dependant mammalian cells under the influence of a low speed rotational motion. This investigation aims to suggest general guidelines, based on experimental evidence, for the design of mini and/or micro-reactors for tissue engineering applications. Stem cells and endothelial cells are cultured in 14 cm glass Petri dishes imprinted with different patterns, and rotated at 0, 3, 5, 8 RPM. The effect of rotational speed and texture on the growth rate and association patterns observed is reported and discussed. In general, cells cultured at low rotational speeds (3 and 5 RPM) grow faster and cover the culture area more homogeneously than those cultured at 0 or 8 RPM. Specific growth rates and doubling times are provided for different agitation conditions. Differences in colonization patterns are explained in terms of local flow effects.