Title of Article: An optimized colony forming assay for low-dose radiation cell survival measurement

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Abstract: The aim of this study is to develop a simple and reliable method to quantify the cell survival of low-dose irradiations. Two crucial factors were considered, the same number of cells plated in each flask and an appropriate interval between cell plating and irradiation. For the former, we optimized cell harvest with trypsin, diluted cells in one container, and directly seeded cells on the bottom of flasks in a low density before irradiation. Reproducible plating efficiency was obtained. For the latter, we plated cells on the bottom of flasks and then monitored the processing of attachment, cell cycle variations, and the plating efficiency after exposure to 20 cGy of X-rays. The results showed that a period of 4.5 h to 7.5 h after plating was suitable for further treatment. In order to confirm the reliability and feasibility of our method, we also measured the survival curves of these Mo59K and Mo59J glioma cell lines by following the optimized protocol and obtained consistent results reported by others with cell sorting system. In conclusion, we successfully developed a reliable and simple way to measure the survival fractions of human cells exposed to low dose irradiation, which might be helpful for the studies on low-dose radiation biology.