Contribution ID: **409** Type: **Oral Presentation**

Neuroblastoma cells efficiently photo-transfected using 1064nm femtosecond laser pulses

Tuesday, 10 July 2012 12:00 (20 minutes)

Abstract content
   (Max 300 words)

Most neuroblastoma cell lines are derived from highly malignant tumors (1). However, many neuroblastoma cell lines remain hard to transfect with established protocols, hindering consecutive analysis. Martinez et al, 2003 (2) in their electroporation studies discovered that compared to non-neuronal cells, neurons were more difficult to transfect. They attributed this finding to the fact that neurons recover more poorly from permeabilization and also express transgenes less effectively compared to other cell types. Neurons are also reported as one of the examples of non-renewing cell types (3). To date photo-transfection has shown to be a valuable tool for nucleic acid delivery in a wide variety of cell types (4, 5). Notably, the capability to photo-transfect neuroblastoma cells with nucleic acid molecules of choice at relatively high efficiency while maintaining cell viability is essential for elucidating various biochemical pathways and other genetic studies. In this study, different optical parameters for the transfection of neuroblastoma cell lines SK-N-SH and NG108-15 were investigated. The average power output of 130 mW at the sample plane and 10 ms time of beam exposure proved to be a photo-toxic dose for NG108-15 and SK-N-SH cells as no fluorescence was detected on analyzing the cells 48 hrs post photo-transfection. Cell detachment, death and lyses in both cell lines were observed at this dose. However, successful transfection was obtainable on treatment with 60 mW and 40 ms in these neuroblastoma cell lines.

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Session Classification: Photonics

Track Classification: Track C - Photonics