ABSTRACT

The zebrafish xenograft assay is a rapid screening technique and the transparency of zebrafish embryo enables the clear identifying of tumor metastasis under the microscope than mice that is difficult to observe and to study at early stages of the process in the deep tissues. Lung cancer is a major cause of cancer-related deaths worldwide, and death of lung cancer patients mainly due to metastasis. We demonstrated the lung cancer metastasis-related gene, Desmocollin-2 (DSC2) that expression levels in lung cancer cells were negatively correlation with the metastasis activity of lung cancer cell lines. The behavior of CL1-0 with low metastasis (DSC2 high expression) and CL1-5 with high metastasis (DSC2 low expression) were analyzed in vivo by xenograft before. In this study, CL1-0 and CL1-5 human lung carcinoma cells were stained with CM-Dil and transplanted into zebrafish larvae at 48 hpf, and the transfer position, optimal number, proliferation, and migration/metastasis were examined, try to establish the optimal condition of in vivo zebrafish culture system for lung cancer study. Preliminary data showed that 300 to 500 cells was the optimal number for injection CL1-0 and CL1-5 than up to 700 cells in zebrafish, the survival rates were above 73 % in both cell lines at 48 h after transfer. Yolk sac would be the optimal transfer site for evaluating the metastasis and whose survival rate was over 62 % other than those in heart, eye cup, and muscle. Additionally, the lower metastasis activity of CL1-0 with DSC2 high expression than CL1-5 with DSC2 low expression was also identified. These results provide not only the insight of effect of human lung cancer cells on the physiological responses of zebrafish but also a sound in vivo analysis system and can be applied in further pharmacological modulators, tumor/cancer and drug screening researches of cancer.

Keywords: metastasis, human lung cancer cells (CL1-0 and CL1-5), xenotransplantation, zebrafish (Danio rerio)