

SCALE-UP STUDY FOR *EX-VIVO* EXPANSION OF ALLOGENEIC NATURAL KILLER CELLS IN STIRRED-TANK BIOREACTOR

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Natural killer (NK) cells are a type of lymphocyte in the blood that are responsible for innate and adaptive immune response, and they mature in the liver and bone marrow. Being a key role in host defense system with direct and indirect killing of virus-infected cells or cancer cells, NK cell has been considered an attractive candidate for cancer therapy. Peripheral blood shows the low frequency of NK cells, so *ex vivo* expansion method is important to obtain sufficient NK cells for therapeutic use. Currently, we successfully developed bioreactor process for NK cell expansion on lab-scale. Stirred-tank bioreactor could be considered as optimal alternative system for large-scale NK cell expansion compared with other ones because it is automated, less labor intensive, scalable, well-controlled and cost-effective. In bioreactor process, agitation is one of important parameters for NK cell expansion because it is necessary to provide homogenous culture conditions. So we defined effects of agitation in bioreactor and figured out an optimum condition. After that scale-up studies were carried out with manufacturing-scale bioreactor based on these results. The results in terms of growth rate, viability cytotoxicity and purity, were comparable with lab-scale.