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Bioengineered Yeast Vacuoles as Drug Delivery Carrier with Induced Proinflammatory Response after Daunorubicin Delivery

Selective therapeutics is one of spotlighted field in pharmaceutical industry. This research is concerned for studying to improve efficiency of drug delivery by target selectivity, biocompatibility and immunological stimulation using drug delivery system based on yeast-derived vacuole. The budding yeast, *Saccharomyces cerevisiae*, is one of the best studied eukaryotic models. *S. cerevisiae* has prominent vacuole correspond to lysosome of mammalian cell. In this study, toll like receptor 2 (TLR2) specific binding peptide that overexpressed on HL-60 was expressed on vacuolar outer membrane. The vacuoles with targeting peptide showed enhanced efficacy to HL-60 cells and target specificity. This study demonstrates that yeast derived vacuoles with nano-sizing and targeting ability can be used potential bio-based drug delivery system for cancer therapy. Also, this vacuole system provides potential strategies and platform for disease selective treatment through simple manipulation of vacuole. After drug delivery, vacuole residue and damage associated molecular patterns (DAMPs) can induce the proinflammatory response of macrophages. In this study, we monitored the regulation of cancer proliferation by induced proinflammatory immune response. This research was supported by the Basic Science Research Program through the National Research Foundation of Korea (NRF), funded by the Ministry of Education (NRF-2021R1A2C2093580).

Keywords: Drug delivery, yeast vacuole, Daunorubicin, Acute Myeloid Leukemia

Biography

Wooil Choi majored in bio-chemical engineering at Jeonbuk National University. He have interested in research scope about application of nano-functional vesicle derived from cells, surface modification of intra-, extra- cellular vesicles, and rapid screening for disease biomarkers and target molecules for development of multi-purpose biomaterials.

