ABSTRACT Conventional combination therapy of chemotherapy and immunotherapy has shown promising outcomes; however, there is still a significant need for a new method of simultaneous chemoimmunotherapy. Essential components for a clinical success of chemoimmunotherapy are a targeted form of chemotherapeutic agents and enhanced tumor homing of effector immune cells. We embedded antibody-drug conjugates (ADC)s, T-DM1, on the surface of NK cells to develop a single injection formulation of targeted chemoimmunotherapy. These surface-engineered NK (SE-NK/T-DM1) cells are able to specifically recognize and destroy the target cancer cells. The SE-NK/T-DM1 cells suppressed the target tumor growth significantly compared to the co-treatment of NK cells with T-DM1. These results suggest that the ADCs-embedded NK cells provide a means of chemoimmunotherapy composed of an antibody, a cytotoxic agent, and an immune effector cell, all of which are contained in a single NK cell.

BIO: Dr. Young-Wook Won joined the University of Arizona Division of Cardiothoracic Surgery on March 6, 2017, in the role of assistant professor, Department of Surgery. His focus is teaching and advising graduate students and establishing an extramurally-funded research program. With a history of published research in the fields of drug delivery systems such as drug recombinant proteins, cancer nano-therapeutics, cancer gene therapy, and biopolymer carriers, his research focuses on the development of innovative strategies to improve the targeted delivery of small molecule drugs, genes, and stem cells by using naturally derived materials, including recombinant fusion proteins.