

# Activation of anti-tumor immunity by metformin, an anti-type 2 diabetic drug

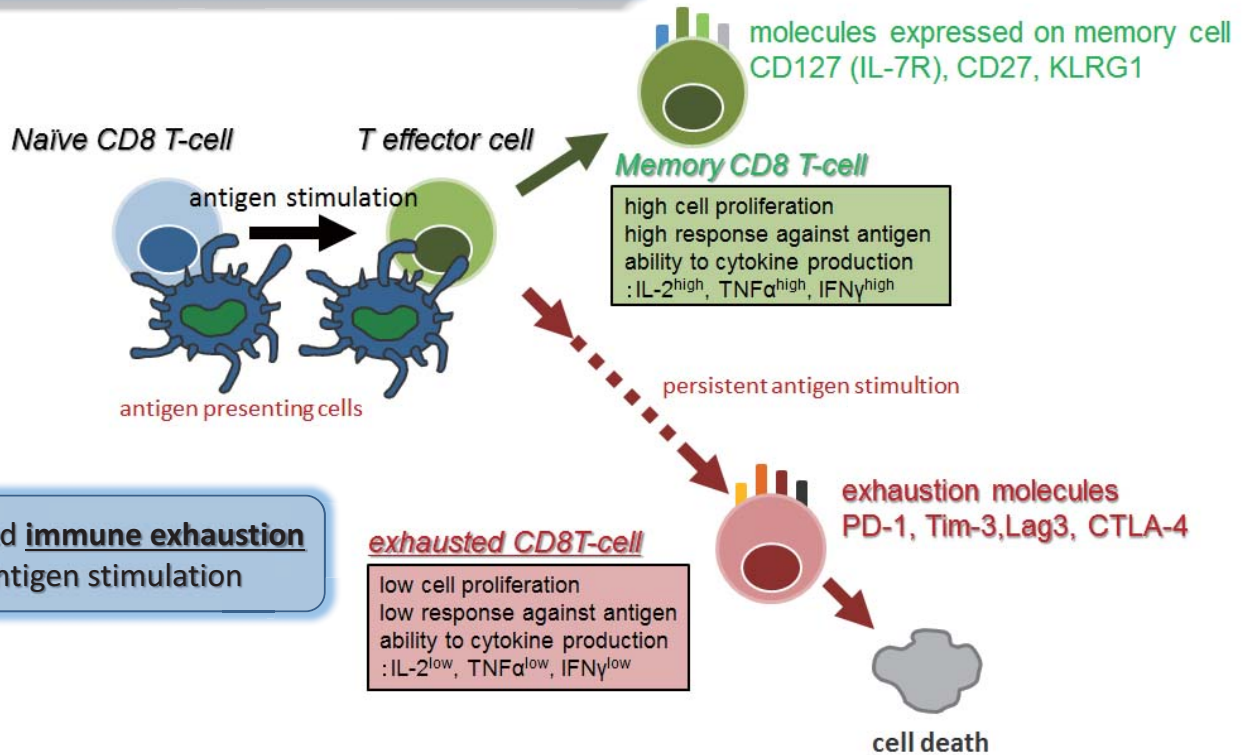
Shingo EIKAWA, Yuki KUNISADA, Heiichiro UDONO

Department of Immunology,

Graduate School of Medicine, Dentistry and Pharmaceutical Sciences,

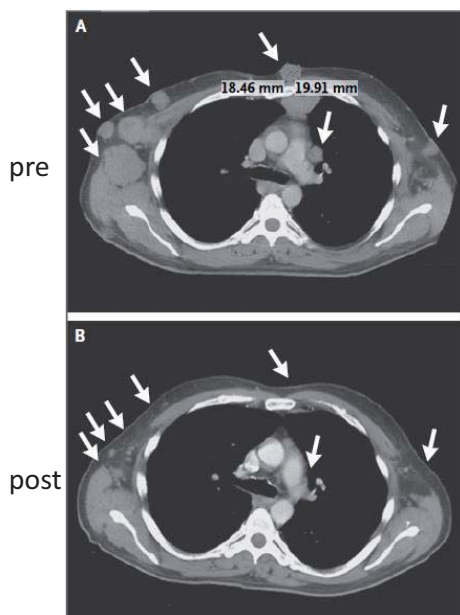
Okayama University

## The mechanism of T-cell immune exhaustion



T-cells were induced immune exhaustion during persistent antigen stimulation

The chest showing tumor regression in a patient received the concurrent regimen of anti-CTLA-4 and anti-PD-1 (CT Scans)



Wolchok JD et al. N Engl J Med. 2013 Jul 11;369(2):122-33

## Metformin-induced reversion of exhausted T cells in tumor microenvironment

