ZFP91 phase isolation mediates phenotypic and functional changes of effector T cells

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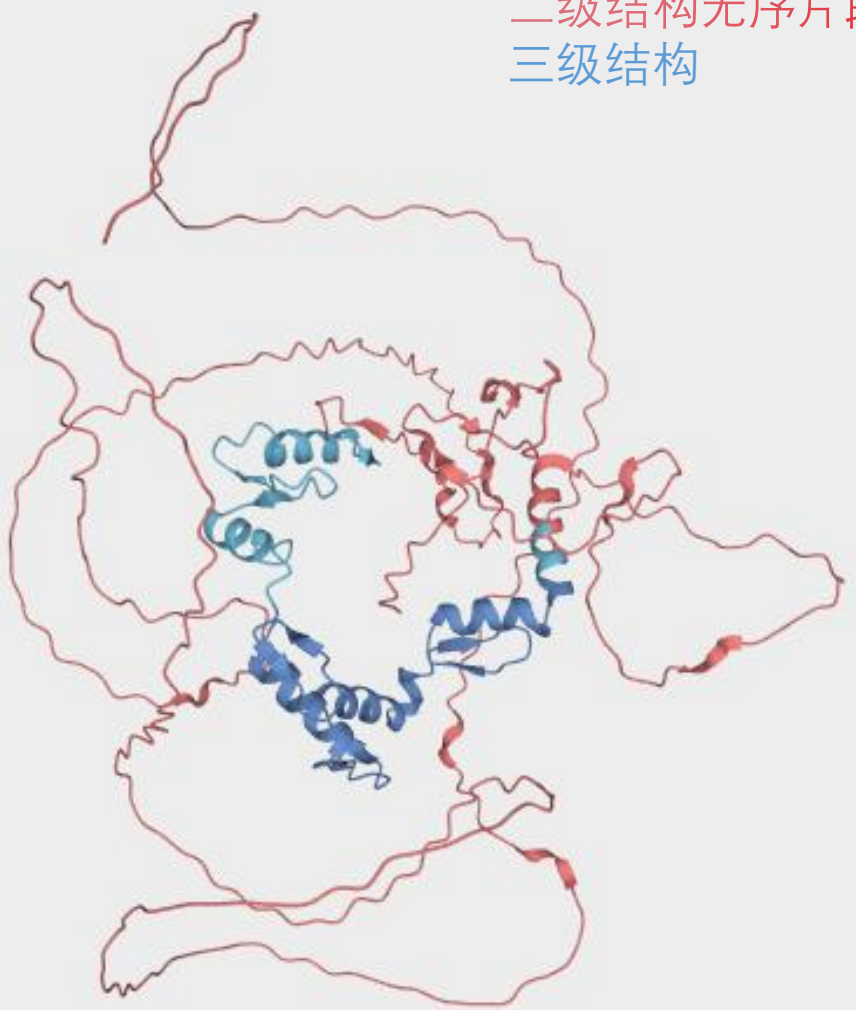
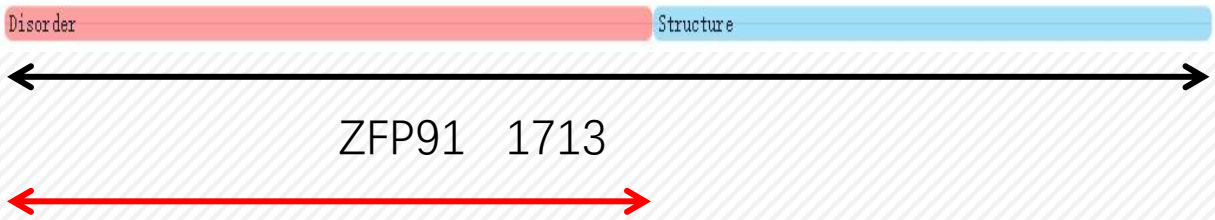
01 ZFP91introduce





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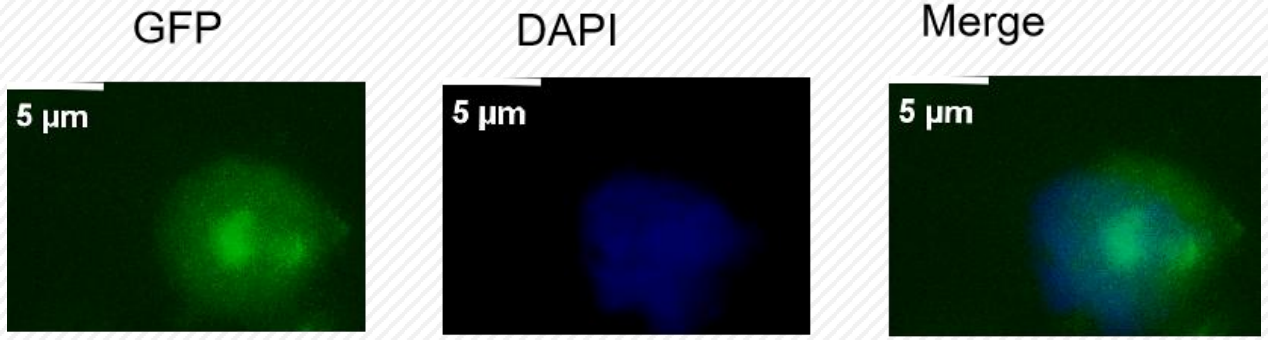
ZFP91

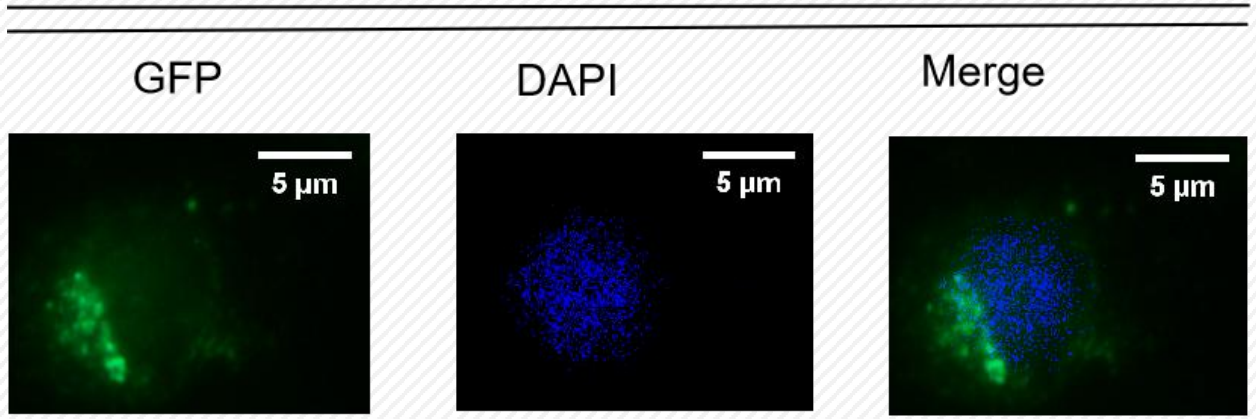
ZFP91, a member of the zinc finger protein family that contains five zinc finger domains, a helix-coil structure, a leucine zipper pattern and several nuclear localization signals, is considered to be a novel E3 ubiquitin ligase. By analyzing the protein structure of ZFP91, it is found that it has disordered

02 The ZFP91 protein undergoes droplet condensation within the T cell.

Resting state human primary T cells



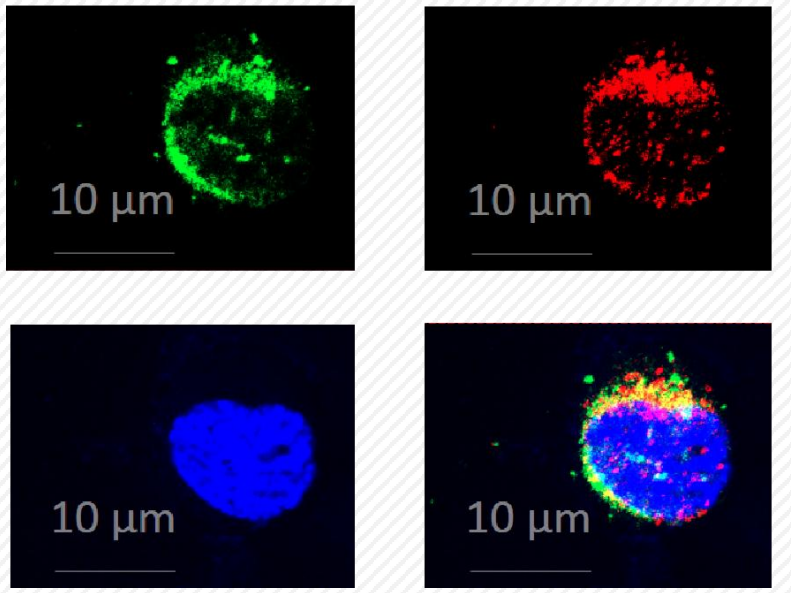
Activated human primary T cells

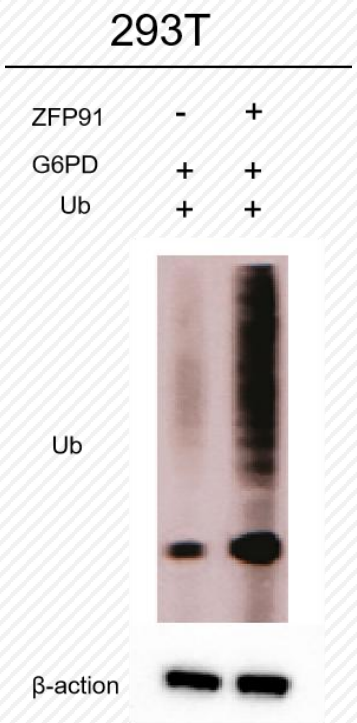


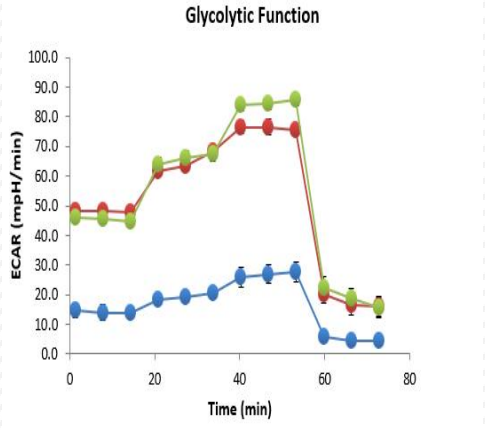
It has been shown that in T cells, when TCR receives signal stimulation, it will cause the nucleoprotein ZFP91 to transfer to the cytoplasm.

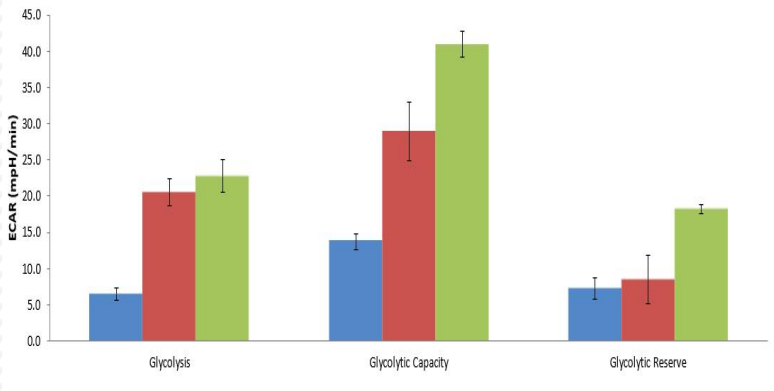
Immunofluorescence staining showed that ZFP91 in T cells could form droplet condensates under physiological conditions and phase separation occurred. It is located in the cytoplasmic nucleus in the resting state T cells and in the cytoplasm in the activated state T cells.

03 Effect of ZFP91 on T cell metabolism









By multicolor immunofluorescence staining, it was observed under confocal microscopy that ZFP91 protein could co-locate with G6PD protein while separating cytoplasmic phase. It is speculated that the ubiquitination of G6PD by ZFP91 is carried out in the condensate droplet.

At the same time, ZFP91, as an E3 ubiquitination ligase, is speculated to be able to degrade G6PD by ubiquitinating, which can be verified by ubiquitination detection in this study.

seahorse analysis of T cells that knocked down ZFP91 also showed significant differences in glycolysis and maximum glycolysis capacity between the two groups of T cells.