**IV-1**

# Monitoring T cell-APC interactions *in vivo*

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Interactions between immune cells in vivo have so far been analyzed primarily by intravital two-photon imaging, which is difficult to implement, inherently low-throughput, and does not allow for isolation of interacting cells for downstream analysis. To overcome these limitations, we developed a novel approach to track ligand-receptor interactions between immune cells, which we call LIPSTIC (Labeling Immune Partnerships by SorTagging Intercellular Contacts). Interacting molecules are modified at their extracellular portion to express the enzyme Sortase A (SrtA) or five N-terminal glycine residues (G5). Upon ligand-receptor engagement, SrtA catalyzes the ligation of a labeled substrate to the G5-tagged receptor, leading to the labeling of the cell participating in the interaction. This method allows for efficient identification of cells undergoing receptor-ligand interactions both in vitro and in vivo.