Regulation and mechanism of the immune function in Natural Killer (NK) cells: nanopatterning approach

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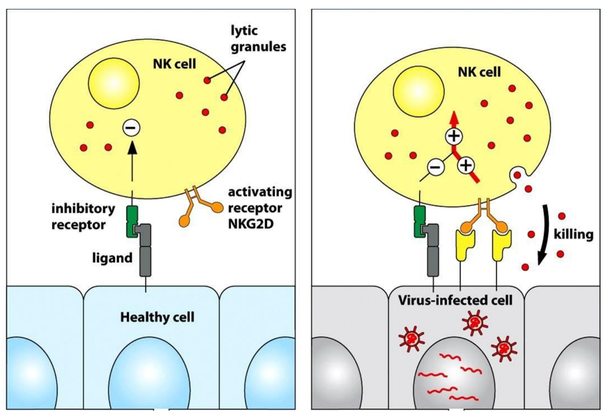
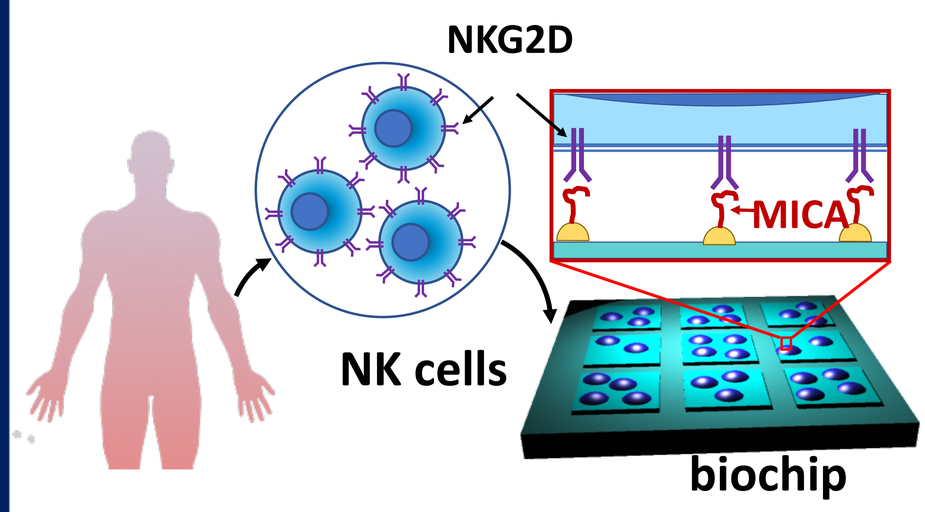
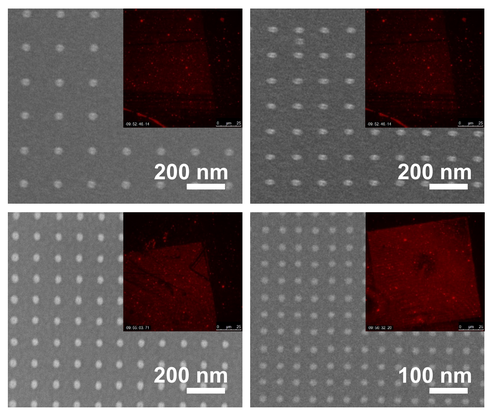
Motivation – understanding nanoscale structure and function of NK immune synapse

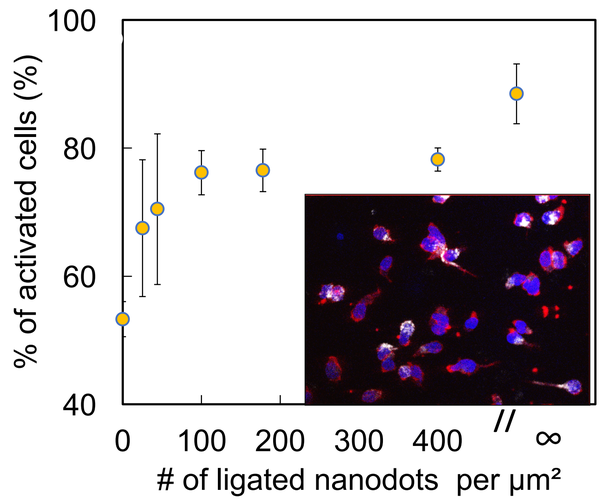
- NK cells are cytotoxic lymphocytes that play the key role the innate immune system
- Their cytotoxicity of NK is regulated by the signaling balance of activating and inhibitory receptors.
- Critical factors in NK cell cytotoxicity that are still not understood:
  - *Spatial arrangement of activating receptors*
  - *Spatial balance between activating and inhibitory receptors*
  - *Receptor mechanosensitivity*



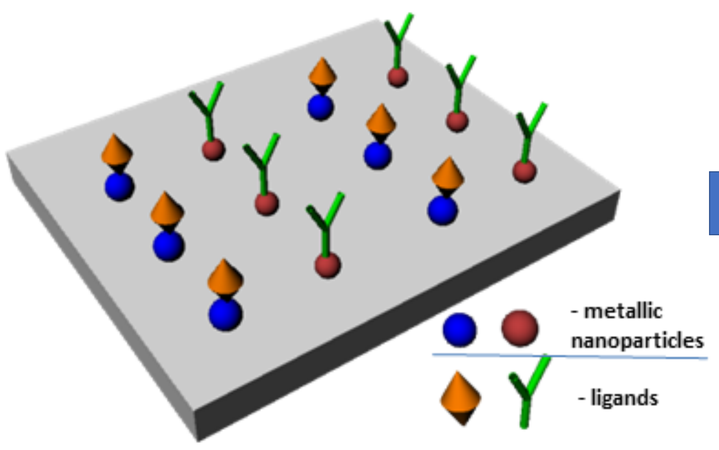
Role of the spatial arrangement of activating receptors (NKG2D)



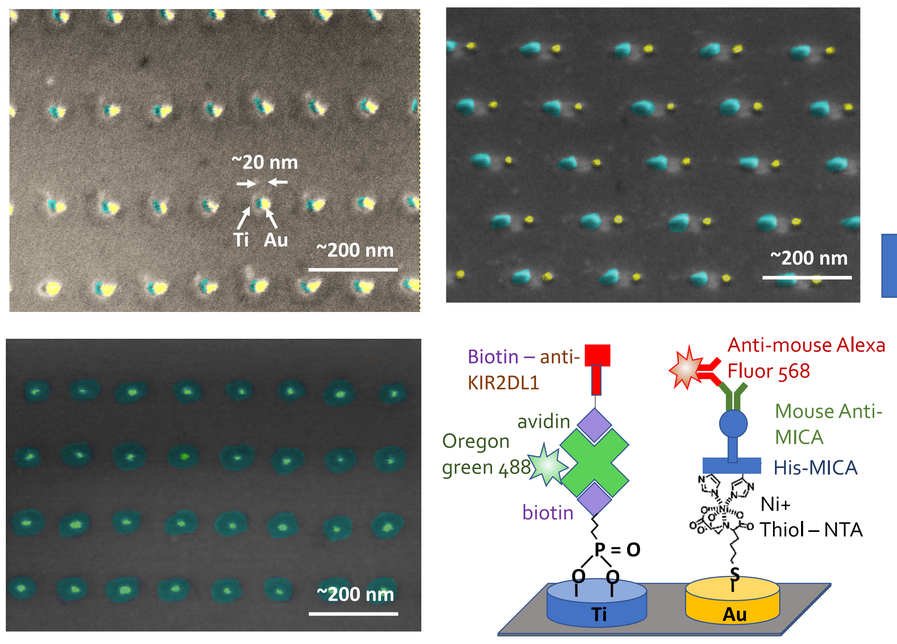


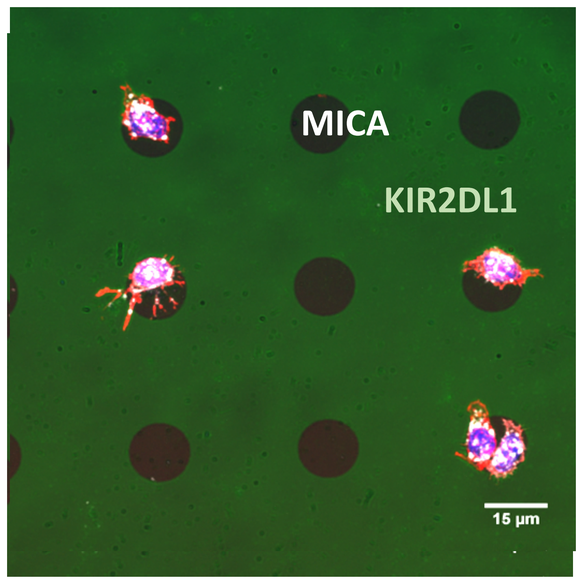


Role of the spatial cross-talk between different receptors

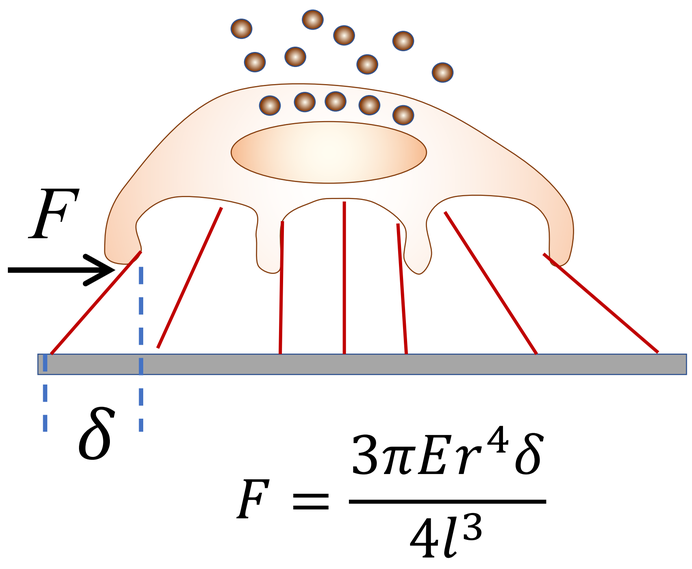


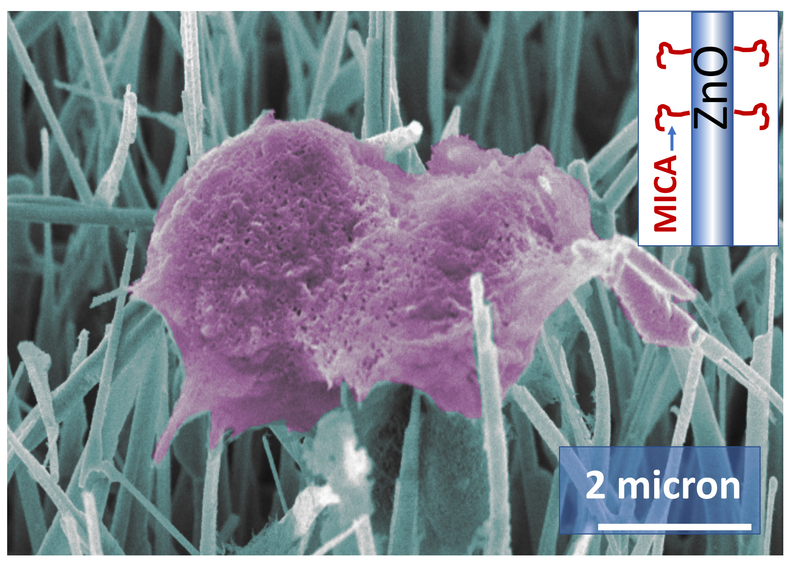
Bi-functional chip

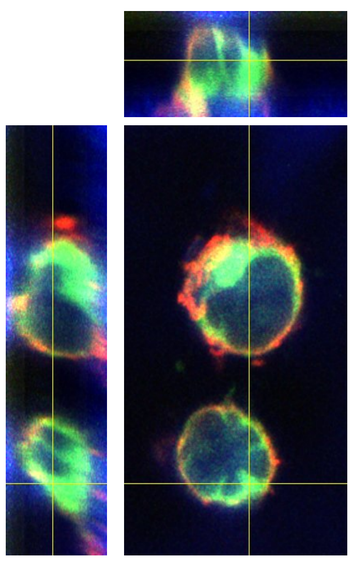


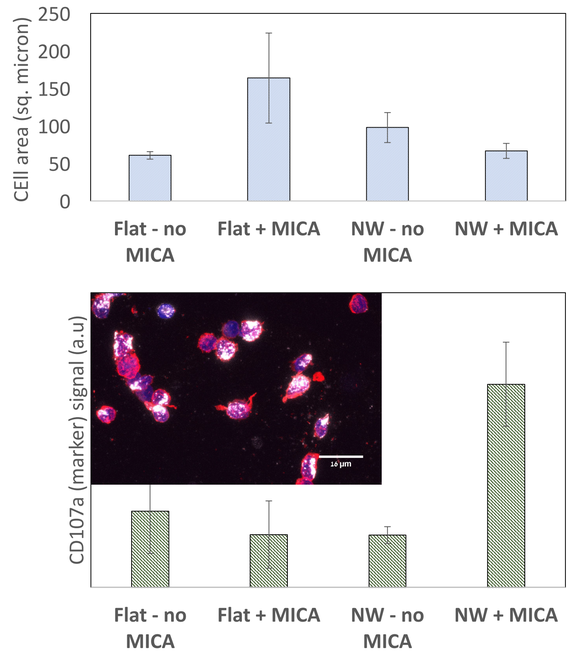


Nanoscale mechanosensitivity: NK cells on nano-"fakir bed"









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