A protein interaction array inside a living cell

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Abstract

Protein arrays are used for parallel analysis of multiple protein interactions in cell extracts. Here, we describe protein interaction arrays in living cells that are based on the interaction of bait presenting artificial receptor constructs (bait-PARCs) in the plasma membrane with micrometer-scaled antibody surface patterns generated by Dip Pen Nanolithography (DPN) and DNA-Directed Immobilization (DDI). The interaction of fluorescent protein-tagged prey proteins with bait-PARCs is monitored via Total Internal Reflection Fluorescence Microscopy (TIRF). We applied this method to simultaneously monitor two distinct protein kinase A subunit interactions in individual living cells. Bait-PARCs and patterned antibodies do not interact with endogenous cell components and therefore minimally perturb signaling properties of cells. The broad availability of orthogonal bait-PARC/antibody pairs allows parallel analysis of multiple protein interactions with high temporal resolution within a single living cell.

References:

1. Silke Gandor et al, "*Protein interaction arrays inside living cells*", Angew. Chem. Int. Ed. 2013, 52, 1 – 5