Seminar/Talk

Probing the nanoscale organization of the T cell receptor in the immunological synapse

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Host: Johann Georg Danzl

Multiple labs have used single molecule localization microscopy (SMLM) to report the presence of protein nanoclusters at the T cell plasma membrane. In particular, the T cell receptor (TCR) complex was suggested to be non-randomly organized in resting T cells (1, 2). This finding has led to a variety of models to explain highly specific and sensitive antigen recognition, which culminates in T cell activation. In our lab, we have previously found that in SMLM experiments, characteristic blinking and resulting overcounting of fluorescent proteins and organic dyes may be easily misinterpreted as molecular clusters. As a possible solution to the problem, we developed a method to discriminate between true protein clusters and multiple counts of the same dye molecules (3).Here, we applied this method to study the organization of the TCR complex in the plasma membrane of resting and activated T cells. While there was clear evidence for the formation of clusters upon activation, no indication of non-homogenous distribution could be obtained under resting conditions. In independent experiments, we confirmed our observations with STED microscopy, yielding similar results. Overall, our data do not support the view of protein nanoclustering being a general ordering principle at the T cell plasma membrane.(1) Lillemeier et at. Nat Immunol. 2010 Jan;11(1):90-6.(2) Pageon et al. Proc Natl Acad Sci U S A. 2016 Sep 13;113(37).(3) Baumgart et al. Nat Meth. 2016;13(8):661-4.

Thursday, June 7, 2018 10:00am - 11:00am
Mondi Seminar Room 3, Central Building

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