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How T cells talk to the neighborhood: the spatiotemporal dynamics of T cell-derived cytokines in cancer

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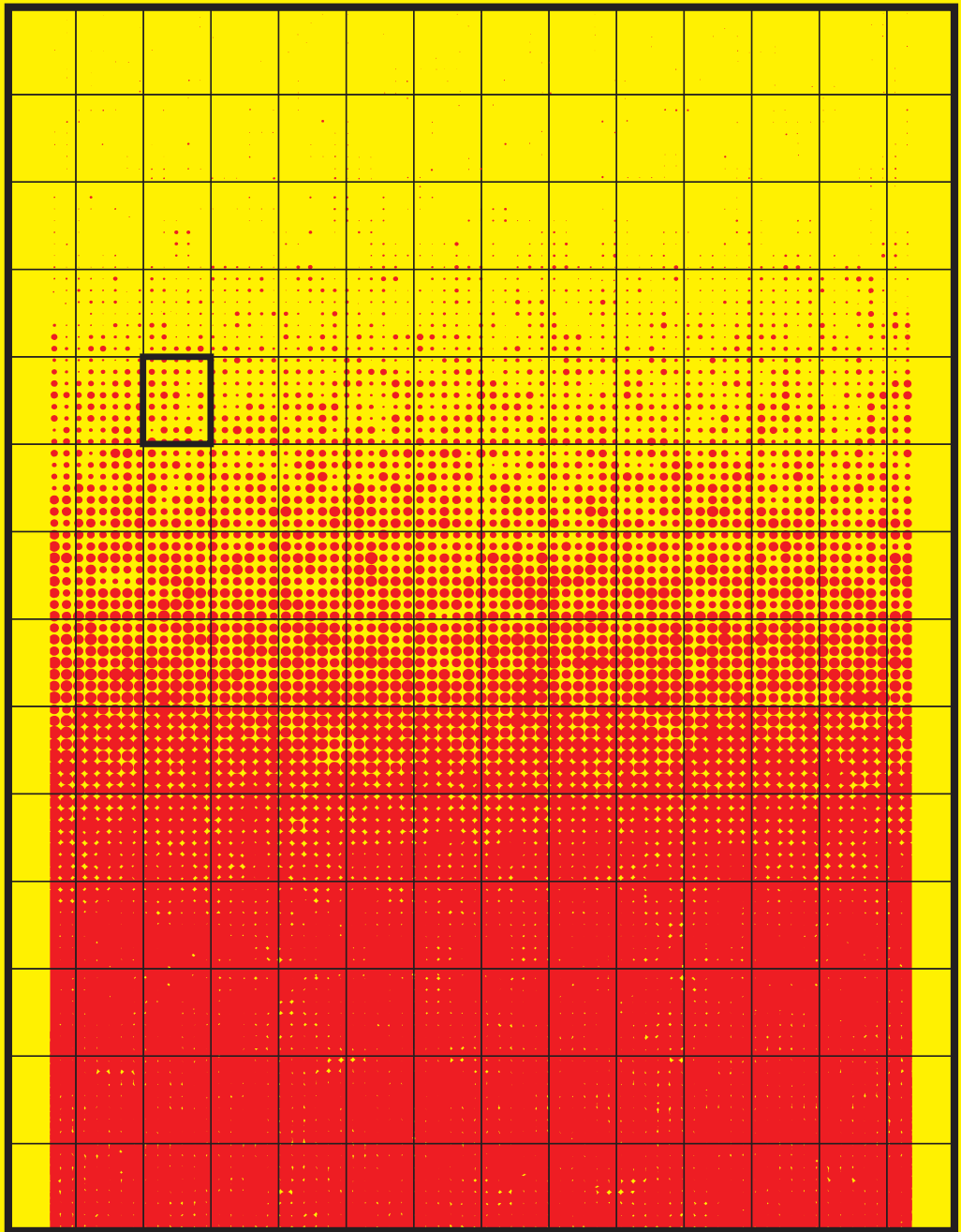
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**HOW T CELLS TALK TO
THE NEIGHBORHOOD**

**THE SPATIAL DYNAMICS OF T CELL-
DERIVED CYTOKINES IN CANCER**

MIRJAM E. HOEKSTRA



About the cover

To communicate with one another, cells in the body release signaling molecules called cytokines. The effects of these cytokines have been demonstrated to be extremely important for a successful immune response, but surprisingly little is known about how cytokines act in space and time. In this thesis, I investigate the spreading of these molecules and describe how activated cytotoxic T cells, which form a key compartment of our immune system, can profoundly modify their surroundings by the generation of widespread cytokine gradients. The red shapes on the cover depict cytokine molecules, secreted by an (invisible) T cell.

During my time as a PhD student, I realized more and more that as a scientist, most of the time you are thoroughly focused on small fragments of a biological story and that only by joining the knowledge of numerous people together, one can eventually come close to understanding complete biological phenomena. To illustrate this observation, I designed a unique cover for each copy of this thesis, which together form the story of my PhD work.

For an overview of the story, please see the **flap** attached to the front cover of this thesis. Together, all 196 printed theses form a single picture: a cytokine gradient. The highlighted small square indicates which part of the picture is printed on the **back cover** of your unique copy of this thesis and reveals its location within the gradient.

