Cancer Immunology Research

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American Association for Cancer Research

November 2014 • Volume 2 • Issue 11

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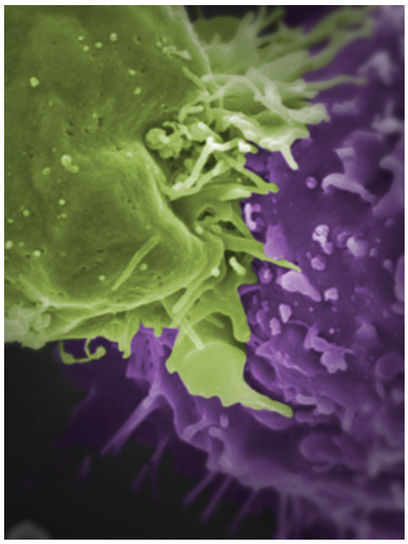
ABOUT THE COVER



The T-cell immunological synapse is a specialized junction formed between a T cell and an antigen-presenting cell. It comprises molecular interactions for antigen recognition regulating the immune response. The immunological synapse integrates three broad categories of receptors: antigen recognition (TCR), adhesion, and costimulatory/checkpoint. The organization of these receptors in the interface has an impact on the way they function. Antigen recognition begins with engagement of a TCR by an MHC–peptide complex. Adhesion molecules provide the energy needed to pull cells together, allowing sustained antigen recognition and precise execution of effector functions. Finally, costimulatory and checkpoint receptors alter the functional outcome of immunological synapse formation and signaling. The cover image is a scanning electronic micrograph showing the interaction between a $CD4^+$ T cell (green) and an antigen-presenting cell (lilac). The image was adapted from Biggs et al., "High-resolution imaging of the immunological synapse and T-cell receptor microclustering through microfabricated substrates" (J R Soc Interface 2011;8:1462–71, by permission of the Royal Society and Dr. S.J. Wind), using an artificial antigen-presenting cell generated by Thomas et al. (Clin Immunol 2002;105:259–72). For details see the Master of Immunology primer by Michael L. Dustin on page 1023 of this issue.

ABOUT THE MASTER

Michael L. Dustin, PhD, is a professor of molecular immunology at the Nuffield Department of Orthopedic, Rheumatology and Musculoskeletal Sciences, and the head of immunology at the Kennedy Institute of Rheumatology at the University of Oxford, UK. He was born in Poughkeepsie, NY, where he was inspired to study biology by looking at pond water through a microscope. He received a BA in biology with honors from Boston University and a PhD in cell and developmental biology from Harvard University. After his PhD work on T-cell adhesion molecules in Timothy Springer's lab, Dr. Dustin joined the laboratory of Stuart Kornfeld at the Washington University School of Medicine, St. Louis (WUStL) to expand his studies in cell biology and microscopy. In 1993, he established his independent laboratory as Assistant Professor of Pathology at WUStL, where he led a collaborative group in discovering the requirements for the T-cell immunological synapse. He moved to the Skirball Institute of Biomolecular Medicine at the New York University School of Medicine in 2001 as the Irene Diamond Professor in Immunology, and then the Muriel G. and George W. Singer Chair Professor of Molecular Immunology. In 2013, Dr. Dustin joined the University of Oxford as a Wellcome Trust Principal Research Fellow.

The Dustin laboratory has made substantial contributions to our understanding of T-cell surface molecules, the mechanism and regulation of T-cell migration in the lymph node and spleen, the mechanism of T-cell tolerance and activation *in vivo* by dendritic cells, and the modulation of T-cell immunological synapses. He has collaborated on intravital microscopy studies on breast and pancreatic cancers. The Dustin team in Oxford is developing new approaches to harness the immunological synapse as a therapeutic target in autoimmune disease and cancer.

Dr. Dustin has served on various scientific advisory boards and journal editorial boards. He is a fellow of the American Association for the Advancement of Sciences. He has received numerous awards, including a Presidential Early Career Award in Science and Engineering and the DART-NYU Biotechnology Award. He was also included in *Esquire* magazine's Best and Brightest in 2001. Dr. Dustin has organized various conferences on imaging of immunoreceptors and the immune system and authored over 250 peer-reviewed, original research papers, review articles, and book chapters. He is an enthusiastic teacher and has mentored over 40 graduate and postgraduate trainees. In addition, His lab has hosted over 20 visiting scientists from around the world. In keeping with his upbringing in the picturesque Hudson Valley, Dr. Dustin enjoys birding, cycling, and nature photography.

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Cancer Immunol Res 2014;2:1023-1124.