

11. References

1. Krug, R. and R. Lamb, *Orthomyxoviridae: The viruses and Their Replication*. 4th edition ed. Fields Virology, ed. H.P. Knipe DM. 2001, Philadelphia: Lippincott Williams & Wilkins.
2. Ibricevic, A., et al., *Influenza virus receptor specificity and cell tropism in mouse and human airway epithelial cells*. J Virol, 2006. **80**(15): p. 7469-80.
3. Matrosovich, M.N., et al., *Human and avian influenza viruses target different cell types in cultures of human airway epithelium*. Proc Natl Acad Sci U S A, 2004. **101**(13): p. 4620-4.
4. Janeway, C.A., Jr. and R. Medzhitov, *Innate immune recognition*. Annu Rev Immunol, 2002. **20**: p. 197-216.
5. Kohl, J., *The role of complement in danger sensing and transmission*. Immunol Res, 2006. **34**(2): p. 157-76.
6. Takeda, K., T. Kaisho, and S. Akira, *Toll-like receptors*. Annu Rev Immunol, 2003. **21**: p. 335-76.
7. Kawai, T. and S. Akira, *Innate immune recognition of viral infection*. Nat Immunol, 2006. **7**(2): p. 131-7.
8. Werts, C., S.E. Girardin, and D.J. Philpott, *TIR, CARD and PYRIN: three domains for an antimicrobial triad*. Cell Death Differ, 2006. **13**(5): p. 798-815.
9. Kato, H., et al., *Cell type-specific involvement of RIG-I in antiviral response*. Immunity, 2005. **23**(1): p. 19-28.
10. Steinman, R.M., *The dendritic cell system and its role in immunogenicity*. Annu Rev Immunol, 1991. **9**: p. 271-96.
11. Shortman, K. and Y.J. Liu, *Mouse and human dendritic cell subtypes*. Nat Rev Immunol, 2002. **2**(3): p. 151-61.
12. Shortman, K. and S.H. Naik, *Steady-state and inflammatory dendritic-cell development*. Nat Rev Immunol, 2006.
13. Wilson, N.S., et al., *Most lymphoid organ dendritic cell types are phenotypically and functionally immature*. Blood, 2003. **102**(6): p. 2187-94.
14. Lambrecht, B.N., J.B. Prins, and H.C. Hoogsteden, *Lung dendritic cells and host immunity to infection*. Eur Respir J, 2001. **18**(4): p. 692-704.
15. Vermaelen, K. and R. Pauwels, *Pulmonary dendritic cells*. Am J Respir Crit Care Med, 2005. **172**(5): p. 530-51.
16. de Heer, H.J., et al., *Dendritic cell subsets and immune regulation in the lung*. Semin Immunol, 2005. **17**(4): p. 295-303.
17. de Heer, H.J., et al., *Essential role of lung plasmacytoid dendritic cells in preventing asthmatic reactions to harmless inhaled antigen*. J Exp Med, 2004. **200**(1): p. 89-98.
18. Asselin-Paturel, C., et al., *Mouse strain differences in plasmacytoid dendritic cell frequency and function revealed by a novel monoclonal antibody*. J Immunol, 2003. **171**(12): p. 6466-77.

19. Banchereau, J. and R.M. Steinman, *Dendritic cells and the control of immunity*. Nature, 1998. **392**(6673): p. 245-52.
20. Legge, K.L. and T.J. Braciale, *Accelerated migration of respiratory dendritic cells to the regional lymph nodes is limited to the early phase of pulmonary infection*. Immunity, 2003. **18**(2): p. 265-77.
21. Vermaelen, K.Y., et al., *Specific migratory dendritic cells rapidly transport antigen from the airways to the thoracic lymph nodes*. J Exp Med, 2001. **193**(1): p. 51-60.
22. Lambrecht, B.N., R.A. Pauwels, and B. Fazekas De St Groth, *Induction of rapid T cell activation, division, and recirculation by intratracheal injection of dendritic cells in a TCR transgenic model*. J Immunol, 2000. **164**(6): p. 2937-46.
23. Holt, P.G., et al., *Origin and steady-state turnover of class II MHC-bearing dendritic cells in the epithelium of the conducting airways*. J Immunol, 1994. **153**(1): p. 256-61.
24. Idzko, M., et al., *Local application of FTY720 to the lung abrogates experimental asthma by altering dendritic cell function*. J Clin Invest, 2006. **116**(11): p. 2935-44.
25. Cavanagh, L.L. and U.H. Von Andrian, *Travellers in many guises: the origins and destinations of dendritic cells*. Immunol Cell Biol, 2002. **80**(5): p. 448-62.
26. Kapsenberg, M.L., *Dendritic-cell control of pathogen-driven T-cell polarization*. Nat Rev Immunol, 2003. **3**(12): p. 984-93.
27. Grakoui, A., et al., *The immunological synapse: a molecular machine controlling T cell activation*. Science, 1999. **285**(5425): p. 221-227.
28. Wykes, M., et al., *Dendritic cells interact directly with naive B lymphocytes to transfer antigen and initiate class switching in a primary T-dependent response*. J Immunol, 1998. **161**(3): p. 1313-9.
29. Thomas, P.G., et al., *Cell-mediated protection in influenza infection*. Emerg Infect Dis, 2006. **12**(1): p. 48-54.
30. Kohlmeier, J.E. and D.L. Woodland, *Memory T cell recruitment to the lung airways*. Curr Opin Immunol, 2006. **18**(3): p. 357-62.
31. Topham, D.J., R.A. Tripp, and P.C. Doherty, *CD8+ T cells clear influenza virus by perforin or Fas-dependent processes*. J Immunol, 1997. **159**(11): p. 5197-200.
32. Dong, C., *Diversification of T-helper-cell lineages: finding the family root of IL-17-producing cells*. Nat Rev Immunol, 2006. **6**(4): p. 329-33.
33. Hashimoto, K., et al., *Respiratory syncytial virus in allergic lung inflammation increases Muc5ac and gob-5*. Am J Respir Crit Care Med, 2004. **170**(3): p. 306-12.
34. Strieter, R.M., J.A. Belperio, and M.P. Keane, *Host innate defenses in the lung: the role of cytokines*. Curr Opin Infect Dis, 2003. **16**(3): p. 193-8.
35. Johansen, P., et al., *CD4 T cells guarantee optimal competitive fitness of CD8 memory T cells*. Eur J Immunol, 2004. **34**(1): p. 91-7.
36. Woodland, D.L., R.J. Hogan, and W. Zhong, *Cellular immunity and memory to respiratory virus infections*. Immunol Res, 2001. **24**(1): p. 53-67.
37. Gerhard, W., et al., *Role of the B-cell response in recovery of mice from primary influenza virus infection*. Immunol Rev, 1997. **159**: p. 95-103.
38. Siegal, F.P., et al., *The nature of the principal type I interferon-producing cells in human blood*. Science, 1999. **284**(5421): p. 1835-7.
39. Cella, M., et al., *Plasmacytoid monocytes migrate to inflamed lymph nodes and produce large amounts of type I interferon*. Nat Med, 1999. **5**(8): p. 919-23.

40. Nakano, H., M. Yanagita, and M.D. Gunn, *CD11c(+)B220(+)Gr-1(+) cells in mouse lymph nodes and spleen display characteristics of plasmacytoid dendritic cells*. J Exp Med, 2001. **194**(8): p. 1171-8.
41. Bjorck, P., *Isolation and characterization of plasmacytoid dendritic cells from Flt3 ligand and granulocyte-macrophage colony-stimulating factor-treated mice*. Blood, 2001. **98**(13): p. 3520-6.
42. Asselin-Paturel, C., et al., *Mouse type I IFN-producing cells are immature APCs with plasmacytoid morphology*. Nat Immunol, 2001. **2**(12): p. 1144-50.
43. Liu, Y.J., *IPC: professional type I interferon-producing cells and plasmacytoid dendritic cell precursors*. Annu Rev Immunol, 2005. **23**: p. 275-306.
44. Colonna, M., G. Trinchieri, and Y.J. Liu, *Plasmacytoid dendritic cells in immunity*. Nat Immunol, 2004. **5**(12): p. 1219-26.
45. Blasius, A., et al., *A cell-surface molecule selectively expressed on murine natural interferon-producing cells that blocks secretion of interferon-alpha*. Blood, 2004. **103**(11): p. 4201-6.
46. Krug, A., et al., *TLR9-dependent recognition of MCMV by IPC and DC generates coordinated cytokine responses that activate antiviral NK cell function*. Immunity, 2004. **21**(1): p. 107-19.
47. Blasius, A.L., et al., *Siglec-H is an IPC-specific receptor that modulates type I IFN secretion through DAPI2*. Blood, 2006. **107**(6): p. 2474-6.
48. Schiavoni, G., et al., *ICSBP is essential for the development of mouse type I interferon-producing cells and for the generation and activation of CD8alpha(+) dendritic cells*. J Exp Med, 2002. **196**(11): p. 1415-25.
49. Allman, D., et al., *Ikaros is required for plasmacytoid dendritic cell differentiation*. Blood, 2006.
50. Pulendran, B., et al., *Flt3-ligand and granulocyte colony-stimulating factor mobilize distinct human dendritic cell subsets in vivo*. J Immunol, 2000. **165**(1): p. 566-72.
51. Brawand, P., et al., *Murine plasmacytoid pre-dendritic cells generated from Flt3 ligand-supplemented bone marrow cultures are immature APCs*. J Immunol, 2002. **169**(12): p. 6711-9.
52. Shigematsu, H., et al., *Plasmacytoid dendritic cells activate lymphoid-specific genetic programs irrespective of their cellular origin*. Immunity, 2004. **21**(1): p. 43-53.
53. D'Amico, A. and L. Wu, *The early progenitors of mouse dendritic cells and plasmacytoid predendritic cells are within the bone marrow hemopoietic precursors expressing Flt3*. J Exp Med, 2003. **198**(2): p. 293-303.
54. Harman, B.C., et al., *Mouse plasmacytoid dendritic cells derive exclusively from estrogen-resistant myeloid progenitors*. Blood, 2006. **108**(3): p. 878-85.
55. Kamogawa-Schifter, Y., et al., *Ly49Q defines 2 pDC subsets in mice*. Blood, 2005. **105**(7): p. 2787-92.
56. Omatsu, Y., et al., *Development of murine plasmacytoid dendritic cells defined by increased expression of an inhibitory NK receptor, Ly49Q*. J Immunol, 2005. **174**(11): p. 6657-62.
57. Pelayo, R., et al., *Derivation of 2 categories of plasmacytoid dendritic cells in murine bone marrow*. Blood, 2005. **105**(11): p. 4407-15.

58. Kadowaki, N., et al., *Subsets of human dendritic cell precursors express different toll-like receptors and respond to different microbial antigens.* J Exp Med, 2001. **194**(6): p. 863-9.
59. Edwards, A.D., et al., *Toll-like receptor expression in murine DC subsets: lack of TLR7 expression by CD8 alpha+ DC correlates with unresponsiveness to imidazoquinolines.* Eur J Immunol, 2003. **33**(4): p. 827-33.
60. Lund, J., et al., *Toll-like receptor 9-mediated recognition of Herpes simplex virus-2 by plasmacytoid dendritic cells.* J Exp Med, 2003. **198**(3): p. 513-20.
61. Krug, A., et al., *Herpes simplex virus type 1 activates murine natural interferon-producing cells through toll-like receptor 9.* Blood, 2004. **103**(4): p. 1433-7.
62. Heil, F., et al., *Species-specific recognition of single-stranded RNA via toll-like receptor 7 and 8.* Science, 2004. **303**(5663): p. 1526-9.
63. Diebold, S.S., et al., *Innate antiviral responses by means of TLR7-mediated recognition of single-stranded RNA.* Science, 2004. **303**(5663): p. 1529-31.
64. Lund, J.M., et al., *Recognition of single-stranded RNA viruses by Toll-like receptor 7.* Proc Natl Acad Sci U S A, 2004. **101**(15): p. 5598-603.
65. Leifer, C.A., et al., *TLR9 is localized in the endoplasmic reticulum prior to stimulation.* J Immunol, 2004. **173**(2): p. 1179-83.
66. Barton, G.M., J.C. Kagan, and R. Medzhitov, *Intracellular localization of Toll-like receptor 9 prevents recognition of self DNA but facilitates access to viral DNA.* Nat Immunol, 2006. **7**(1): p. 49-56.
67. Hemmi, H., et al., *Small anti-viral compounds activate immune cells via the TLR7 MyD88-dependent signaling pathway.* Nat Immunol, 2002. **3**(2): p. 196-200.
68. Krug, A., et al., *Toll-like receptor expression reveals CpG DNA as a unique microbial stimulus for plasmacytoid dendritic cells which synergizes with CD40 ligand to induce high amounts of IL-12.* Eur J Immunol, 2001. **31**(10): p. 3026-37.
69. Hochrein, H., et al., *Herpes simplex virus type-1 induces IFN-alpha production via Toll-like receptor 9-dependent and -independent pathways.* Proc Natl Acad Sci U S A, 2004. **101**(31): p. 11416-21.
70. Gursel, M., et al., *CXCL16 influences the nature and specificity of CpG-induced immune activation.* J Immunol, 2006. **177**(3): p. 1575-80.
71. Akira, S. and K. Takeda, *Toll-like receptor signalling.* Nat Rev Immunol, 2004. **4**(7): p. 499-511.
72. Kawai, T., et al., *Interferon-alpha induction through Toll-like receptors involves a direct interaction of IRF7 with MyD88 and TRAF6.* Nat Immunol, 2004. **5**(10): p. 1061-8.
73. Uematsu, S., et al., *Interleukin-1 receptor-associated kinase-1 plays an essential role for Toll-like receptor (TLR)7- and TLR9-mediated interferon-{alpha} induction.* J Exp Med, 2005. **201**(6): p. 915-23.
74. Yang, K., et al., *Human TLR-7-, -8-, and -9-mediated induction of IFN-alpha/beta and -lambda is IRAK-4 dependent and redundant for protective immunity to viruses.* Immunity, 2005. **23**(5): p. 465-78.
75. Takauji, R., et al., *CpG-DNA-induced IFN-alpha production involves p38 MAPK-dependent STAT1 phosphorylation in human plasmacytoid dendritic cell precursors.* J Leukoc Biol, 2002. **72**(5): p. 1011-9.

76. Izaguirre, A., et al., *Comparative analysis of IRF and IFN-alpha expression in human plasmacytoid and monocyte-derived dendritic cells*. J Leukoc Biol, 2003. **74**(6): p. 1125-38.
77. Takeda, K. and S. Akira, *Toll-like receptors in innate immunity*. Int Immunol, 2005. **17**(1): p. 1-14.
78. Osawa, Y., et al., *Collaborative action of NF-kappaB and p38 MAPK is involved in CpG DNA-induced IFN-alpha and chemokine production in human plasmacytoid dendritic cells*. J Immunol, 2006. **177**(7): p. 4841-52.
79. O'Keeffe, M., et al., *Distinct roles for the NF-kappaB1 and c-Rel transcription factors in the differentiation and survival of plasmacytoid and conventional dendritic cells activated by TLR-9 signals*. Blood, 2005. **106**(10): p. 3457-64.
80. Zhang, J., et al., *Characterization of Siglec-H as a novel endocytic receptor expressed on murine plasmacytoid dendritic cell precursors*. Blood, 2006. **107**(9): p. 3600-8.
81. Fuchs, A., et al., *Paradoxical inhibition of human natural interferon-producing cells by the activating receptor NKp44*. Blood, 2005. **106**(6): p. 2076-82.
82. Shuai, K. and B. Liu, *Regulation of JAK-STAT signalling in the immune system*. Nat Rev Immunol, 2003. **3**(11): p. 900-11.
83. Sanjuan, M.A., et al., *CpG-induced tyrosine phosphorylation occurs via a TLR9-independent mechanism and is required for cytokine secretion*. J Cell Biol, 2006. **172**(7): p. 1057-68.
84. Ruse, M. and U.G. Knaus, *New players in TLR-mediated innate immunity: PI3K and small Rho GTPases*. Immunol Res, 2006. **34**(1): p. 33-48.
85. Hoshino, K., et al., *IkappaB kinase-alpha is critical for interferon-alpha production induced by Toll-like receptors 7 and 9*. Nature, 2006. **440**(7086): p. 949-53.
86. Katsoulidis, E., et al., *The p38 mitogen-activated protein kinase pathway in interferon signal transduction*. J Interferon Cytokine Res, 2005. **25**(12): p. 749-56.
87. Pestka, S., C.D. Krause, and M.R. Walter, *Interferons, interferon-like cytokines, and their receptors*. Immunol Rev, 2004. **202**: p. 8-32.
88. Le Bon, A., et al., *Cross-priming of CD8+ T cells stimulated by virus-induced type I interferon*. Nat Immunol, 2003. **4**(10): p. 1009-15.
89. Honda, K., et al., *Selective contribution of IFN-alpha/beta signaling to the maturation of dendritic cells induced by double-stranded RNA or viral infection*. Proc Natl Acad Sci U S A, 2003. **100**(19): p. 10872-7.
90. Biron, C.A., et al., *Natural killer cells in antiviral defense: function and regulation by innate cytokines*. Annu Rev Immunol, 1999. **17**: p. 189-220.
91. Tough, D.F., P. Borrow, and J. Sprent, *Induction of bystander T cell proliferation by viruses and type I interferon in vivo*. Science, 1996. **272**(5270): p. 1947-50.
92. Gerosa, F., et al., *The reciprocal interaction of NK cells with plasmacytoid or myeloid dendritic cells profoundly affects innate resistance functions*. J Immunol, 2005. **174**(2): p. 727-34.
93. Nguyen, K.B., et al., *Interferon alpha/beta-mediated inhibition and promotion of interferon gamma: STAT1 resolves a paradox*. Nat Immunol, 2000. **1**(1): p. 70-6.
94. Kemp, T.J., B.D. Elzey, and T.S. Griffith, *Plasmacytoid dendritic cell-derived IFN-alpha induces TNF-related apoptosis-inducing ligand/Apo-2L-mediated antitumor*

- activity by human monocytes following CpG oligodeoxynucleotide stimulation. *J Immunol*, 2003. **171**(1): p. 212-8.
95. Chaperot, L., et al., *Virus or TLR agonists induce TRAIL-mediated cytotoxic activity of plasmacytoid dendritic cells*. *J Immunol*, 2006. **176**(1): p. 248-55.
96. Dalod, M., et al., *Dendritic cell responses to early murine cytomegalovirus infection: subset functional specialization and differential regulation by interferon alpha/beta*. *J Exp Med*, 2003. **197**(7): p. 885-98.
97. Jego, G., et al., *Plasmacytoid dendritic cells induce plasma cell differentiation through type I interferon and interleukin 6*. *Immunity*, 2003. **19**(2): p. 225-34.
98. Coro, E.S., W.L. Chang, and N. Baumgarth, *Type I IFN receptor signals directly stimulate local B cells early following influenza virus infection*. *J Immunol*, 2006. **176**(7): p. 4343-51.
99. Cerutti, A., X. Qiao, and B. He, *Plasmacytoid dendritic cells and the regulation of immunoglobulin heavy chain class switching*. *Immunol Cell Biol*, 2005. **83**(5): p. 554-62.
100. Poeck, H., et al., *Plasmacytoid dendritic cells, antigen, and CpG-C license human B cells for plasma cell differentiation and immunoglobulin production in the absence of T-cell help*. *Blood*, 2004. **103**(8): p. 3058-64.
101. Cella, M., et al., *Plasmacytoid dendritic cells activated by influenza virus and CD40L drive a potent TH1 polarization*. *Nat Immunol*, 2000. **1**(4): p. 305-10.
102. Boonstra, A., et al., *Flexibility of mouse classical and plasmacytoid-derived dendritic cells in directing T helper type 1 and 2 cell development: dependency on antigen dose and differential toll-like receptor ligation*. *J Exp Med*, 2003. **197**(1): p. 101-9.
103. Salio, M., et al., *CpG-matured murine plasmacytoid dendritic cells are capable of in vivo priming of functional CD8 T cell responses to endogenous but not exogenous antigens*. *J Exp Med*, 2004. **199**(4): p. 567-79.
104. Schlecht, G., et al., *Murine plasmacytoid dendritic cells induce effector/memory CD8+ T-cell responses in vivo after viral stimulation*. *Blood*, 2004. **104**(6): p. 1808-15.
105. Kadowaki, N., et al., *Natural interferon alpha/beta-producing cells link innate and adaptive immunity*. *J Exp Med*, 2000. **192**(2): p. 219-26.
106. Ito, T., et al., *Plasmacytoid dendritic cells regulate Th cell responses through OX40 ligand and type I IFNs*. *J Immunol*, 2004. **172**(7): p. 4253-9.
107. Zuniga, E.I., et al., *Bone marrow plasmacytoid dendritic cells can differentiate into myeloid dendritic cells upon virus infection*. *Nat Immunol*, 2004. **5**(12): p. 1227-34.
108. Belz, G.T., et al., *Cutting edge: conventional CD8 alpha+ dendritic cells are generally involved in priming CTL immunity to viruses*. *J Immunol*, 2004. **172**(4): p. 1996-2000.
109. Belz, G.T., et al., *Distinct migrating and nonmigrating dendritic cell populations are involved in MHC class I-restricted antigen presentation after lung infection with virus*. *Proc Natl Acad Sci U S A*, 2004. **101**(23): p. 8670-5.
110. Krug, A., et al., *Interferon-producing cells fail to induce proliferation of naive T cells but can promote expansion and T helper 1 differentiation of antigen-experienced unpolarized T cells*. *J Exp Med*, 2003. **197**(7): p. 899-906.
111. Marschner, A., et al., *CpG ODN enhance antigen-specific NKT cell activation via plasmacytoid dendritic cells*. *Eur J Immunol*, 2005. **35**(8): p. 2347-57.

112. Montoya, C.J., et al., *Activation of plasmacytoid dendritic cells with TLR9 agonists initiates invariant NKT cell-mediated cross-talk with myeloid dendritic cells*. J Immunol, 2006. **177**(2): p. 1028-39.
113. Ochando, J.C., et al., *Alloantigen-presenting plasmacytoid dendritic cells mediate tolerance to vascularized grafts*. Nat Immunol, 2006. **7**(6): p. 652-62.
114. Kawamura, K., et al., *Virus-stimulated plasmacytoid dendritic cells induce CD4+ cytotoxic regulatory T cells*. Blood, 2006. **107**(3): p. 1031-8.
115. Moseman, E.A., et al., *Human plasmacytoid dendritic cells activated by CpG oligodeoxynucleotides induce the generation of CD4+CD25+ regulatory T cells*. J Immunol, 2004. **173**(7): p. 4433-42.
116. Martin, P., et al., *Characterization of a new subpopulation of mouse CD8alpha+ B220+ dendritic cells endowed with type I interferon production capacity and tolerogenic potential*. Blood, 2002. **100**(2): p. 383-90.
117. Gilliet, M. and Y.J. Liu, *Generation of human CD8 T regulatory cells by CD40 ligand-activated plasmacytoid dendritic cells*. J Exp Med, 2002. **195**(6): p. 695-704.
118. Munn, D.H., et al., *Expression of indoleamine 2,3-dioxygenase by plasmacytoid dendritic cells in tumor-draining lymph nodes*. J Clin Invest, 2004. **114**(2): p. 280-90.
119. Boasso, A., et al., *HIV-1 inhibits CD4+ T cell proliferation by inducing indoleamine 2,3-dioxygenase in plasmacytoid dendritic cells*. Blood, 2006.
120. Piqueras, B., et al., *Upon viral exposure, myeloid and plasmacytoid dendritic cells produce 3 waves of distinct chemokines to recruit immune effectors*. Blood, 2006. **107**(7): p. 2613-8.
121. Krug, A., et al., *IFN-producing cells respond to CXCR3 ligands in the presence of CXCL12 and secrete inflammatory chemokines upon activation*. J Immunol, 2002. **169**(11): p. 6079-83.
122. Penna, G., et al., *Cutting edge: differential chemokine production by myeloid and plasmacytoid dendritic cells*. J Immunol, 2002. **169**(12): p. 6673-6.
123. Megjugorac, N.J., et al., *Virally stimulated plasmacytoid dendritic cells produce chemokines and induce migration of T and NK cells*. J Leukoc Biol, 2004. **75**(3): p. 504-14.
124. Bendriss-Vermare, N., et al., *Virus overrides the propensity of human CD40L-activated plasmacytoid dendritic cells to produce Th2 mediators through synergistic induction of IFN- γ and Th1 chemokine production*. J Leukoc Biol, 2005. **78**(4): p. 954-66.
125. Springer, T.A., *Traffic signals for lymphocyte recirculation and leukocyte emigration: The multi-step paradigm*. Cell, 1994. **76**: p. 301-314.
126. Pillarisetty, V.G., et al., *Liver dendritic cells are less immunogenic than spleen dendritic cells because of differences in subtype composition*. J Immunol, 2004. **172**(2): p. 1009-17.
127. Bendriss-Vermare, N., et al., *Human thymus contains IFN-alpha-producing CD11c(-), myeloid CD11c(+), and mature interdigitating dendritic cells*. J Clin Invest, 2001. **107**(7): p. 835-44.
128. Asselin-Paturel, C., et al., *Type I interferon dependence of plasmacytoid dendritic cell activation and migration*. J Exp Med, 2005. **201**(7): p. 1157-67.
129. Diacovo, T.G., et al., *Adhesive mechanisms governing interferon-producing cell recruitment into lymph nodes*. J Exp Med, 2005. **202**(5): p. 687-96.

130. Zou, W., et al., *Stromal-derived factor-1 in human tumors recruits and alters the function of plasmacytoid precursor dendritic cells*. Nat Med, 2001. **7**(12): p. 1339-46.
131. Yoneyama, H., et al., *Evidence for recruitment of plasmacytoid dendritic cell precursors to inflamed lymph nodes through high endothelial venules*. Int Immunol, 2004. **16**(7): p. 915-28.
132. Kohrgruber, N., et al., *Plasmacytoid dendritic cell recruitment by immobilized CXCR3 ligands*. J Immunol, 2004. **173**(11): p. 6592-602.
133. Penna, G., S. Sozzani, and L. Adorini, *Cutting edge: selective usage of chemokine receptors by plasmacytoid dendritic cells*. J Immunol, 2001. **167**(4): p. 1862-6.
134. Vanbervliet, B., et al., *The inducible CXCR3 ligands control plasmacytoid dendritic cell responsiveness to the constitutive chemokine stromal cell-derived factor 1 (SDF-1)/CXCL12*. J Exp Med, 2003. **198**(5): p. 823-30.
135. Vermi, W., et al., *Role of ChemR23 in directing the migration of myeloid and plasmacytoid dendritic cells to lymphoid organs and inflamed skin*. J Exp Med, 2005. **201**(4): p. 509-15.
136. Zabel, B.A., A.M. Silverio, and E.C. Butcher, *Chemokine-like receptor 1 expression and chemerin-directed chemotaxis distinguish plasmacytoid from myeloid dendritic cells in human blood*. J Immunol, 2005. **174**(1): p. 244-51.
137. Schnurr, M., et al., *Role of adenosine receptors in regulating chemotaxis and cytokine production of plasmacytoid dendritic cells*. Blood, 2004. **103**(4): p. 1391-7.
138. Gutzmer, R., et al., *Human Plasmacytoid Dendritic Cells Express Receptors for Anaphylatoxins C3a and C5a and Are Chemoattracted to C3a and C5a*. J Invest Dermatol, 2006.
139. Duan, X.Z., et al., *Decreased frequency and function of circulating plasmacytoid dendritic cells (pDC) in hepatitis B virus infected humans*. J Clin Immunol, 2004. **24**(6): p. 637-46.
140. Ulsenheimer, A., et al., *Plasmacytoid dendritic cells in acute and chronic hepatitis C virus infection*. Hepatology, 2005. **41**(3): p. 643-51.
141. Smed-Sorensen, A., et al., *Differential susceptibility to human immunodeficiency virus type 1 infection of myeloid and plasmacytoid dendritic cells*. J Virol, 2005. **79**(14): p. 8861-9.
142. Lore, K., et al., *Myeloid and plasmacytoid dendritic cells transfer HIV-1 preferentially to antigen-specific CD4+ T cells*. J Exp Med, 2005. **201**(12): p. 2023-33.
143. Beignon, A.S., et al., *Endocytosis of HIV-1 activates plasmacytoid dendritic cells via Toll-like receptor-viral RNA interactions*. J Clin Invest, 2005. **115**(11): p. 3265-75.
144. Soumelis, V., et al., *Depletion of circulating natural type 1 interferon-producing cells in HIV-infected AIDS patients*. Blood, 2001. **98**(4): p. 906-12.
145. Teig, N., et al., *Age-related changes in human blood dendritic cell subpopulations*. Scand J Immunol, 2002. **55**(5): p. 453-7.
146. Shodell, M. and F.P. Siegal, *Circulating, interferon-producing plasmacytoid dendritic cells decline during human ageing*. Scand J Immunol, 2002. **56**(5): p. 518-21.
147. Banchereau, J. and V. Pascual, *Type I interferon in systemic lupus erythematosus and other autoimmune diseases*. Immunity, 2006. **25**(3): p. 383-92.
148. Nestle, F.O., et al., *Plasmacytoid predendritic cells initiate psoriasis through interferon-alpha production*. J Exp Med, 2005. **202**(1): p. 135-43.

149. Cavanagh, L.L., et al., *Rheumatoid arthritis synovium contains plasmacytoid dendritic cells*. *Arthritis Res Ther*, 2005. **7**(2): p. R230-40.
150. Lande, R., et al., *Characterization and recruitment of plasmacytoid dendritic cells in synovial fluid and tissue of patients with chronic inflammatory arthritis*. *J Immunol*, 2004. **173**(4): p. 2815-24.
151. Preble, O.T., et al., *Systemic lupus erythematosus: presence in human serum of an unusual acid-labile leukocyte interferon*. *Science*, 1982. **216**(4544): p. 429-31.
152. Blanco, P., et al., *Induction of dendritic cell differentiation by IFN-alpha in systemic lupus erythematosus*. *Science*, 2001. **294**(5546): p. 1540-3.
153. Farkas, L., et al., *Plasmacytoid dendritic cells (natural interferon- alpha/beta-producing cells) accumulate in cutaneous lupus erythematosus lesions*. *Am J Pathol*, 2001. **159**(1): p. 237-43.
154. Bave, U., et al., *Fc gamma RIIa is expressed on natural IFN-alpha-producing cells (plasmacytoid dendritic cells) and is required for the IFN-alpha production induced by apoptotic cells combined with lupus IgG*. *J Immunol*, 2003. **171**(6): p. 3296-302.
155. Means, T.K., et al., *Human lupus autoantibody-DNA complexes activate DCs through cooperation of CD32 and TLR9*. *J Clin Invest*, 2005. **115**(2): p. 407-17.
156. Barrat, F.J., et al., *Nucleic acids of mammalian origin can act as endogenous ligands for Toll-like receptors and may promote systemic lupus erythematosus*. *J Exp Med*, 2005. **202**(8): p. 1131-9.
157. Boule, M.W., et al., *Toll-like receptor 9-dependent and -independent dendritic cell activation by chromatin-immunoglobulin G complexes*. *J Exp Med*, 2004. **199**(12): p. 1631-40.
158. Vollmer, J., et al., *Immune stimulation mediated by autoantigen binding sites within small nuclear RNAs involves Toll-like receptors 7 and 8*. *J Exp Med*, 2005. **202**(11): p. 1575-85.
159. Christensen, S.R., et al., *Toll-like receptor 7 and TLR9 dictate autoantibody specificity and have opposing inflammatory and regulatory roles in a murine model of lupus*. *Immunity*, 2006. **25**(3): p. 417-28.
160. Dunn, G.P., C.M. Koebel, and R.D. Schreiber, *Interferons, immunity and cancer immunoediting*. *Nat Rev Immunol*, 2006. **6**(11): p. 836-48.
161. Fugier-Vivier, I.J., et al., *Plasmacytoid precursor dendritic cells facilitate allogeneic hematopoietic stem cell engraftment*. *J Exp Med*, 2005. **201**(3): p. 373-83.
162. Adlam, M., et al., *Positive selection induces CD4 promoter and enhancer function*. *Int Immunol*, 1997. **9**(6): p. 877-87.
163. Siu, G., et al., *A transcriptional silencer controls the developmental expression of the CD4 gene*. *Embo J*, 1994. **13**(15): p. 3570-3579.
164. Manjunath, N., et al., *A transgenic mouse model to analyze CD8(+) effector T cell differentiation in vivo*. *Proc. Natl. Acad. Sci. U S A*, 1999. **96**(24): p. 13932-13937.
165. Sawada, S., et al., *A lineage-specific transcriptional silencer regulates CD4 gene expression during T lymphocyte development*. *Cell*, 1994. **77**: p. 917-929.
166. Muller, U., et al., *Functional role of type I and type II interferons in antiviral defense*. *Science*, 1994. **264**(5167): p. 1918-21.
167. Kirstetter, P., et al., *Ikaros is critical for B cell differentiation and function*. *Eur J Immunol*, 2002. **32**(3): p. 720-30.

168. Mach, N., et al., *Differences in dendritic cells stimulated in vivo by tumors engineered to secrete granulocyte-macrophage colony-stimulating factor or Flt3-ligand*. *Cancer Res*, 2000. **60**(12): p. 3239-46.
169. Mason, N.J., et al., *TRAF6-dependent mitogen-activated protein kinase activation differentially regulates the production of interleukin-12 by macrophages in response to Toxoplasma gondii*. *Infect Immun*, 2004. **72**(10): p. 5662-7.
170. Krutzik, P.O. and G.P. Nolan, *Intracellular phospho-protein staining techniques for flow cytometry: monitoring single cell signaling events*. *Cytometry A*, 2003. **55**(2): p. 61-70.
171. McKenna, K., A.S. Beignon, and N. Bhardwaj, *Plasmacytoid dendritic cells: linking innate and adaptive immunity*. *J Virol*, 2005. **79**(1): p. 17-27.
172. Smit, J.J., B.D. Rudd, and N.W. Lukacs, *Plasmacytoid dendritic cells inhibit pulmonary immunopathology and promote clearance of respiratory syncytial virus*. *J Exp Med*, 2006. **203**(5): p. 1153-9.
173. Wang, H., N. Peters, and J. Schwarze, *Plasmacytoid dendritic cells limit viral replication, pulmonary inflammation, and airway hyperresponsiveness in respiratory syncytial virus infection*. *J Immunol*, 2006. **177**(9): p. 6263-70.
174. Yoneyama, H., et al., *Plasmacytoid DCs help lymph node DCs to induce anti-HSV CTLs*. *J Exp Med*, 2005. **202**(3): p. 425-35.
175. O'Keeffe, M., et al., *Mouse plasmacytoid cells: long-lived cells, heterogeneous in surface phenotype and function, that differentiate into CD8(+) dendritic cells only after microbial stimulus*. *J Exp Med*, 2002. **196**(10): p. 1307-19.
176. Soumelis, V. and Y.J. Liu, *From plasmacytoid to dendritic cell: Morphological and functional switches during plasmacytoid pre-dendritic cell differentiation*. *Eur J Immunol*, 2006.
177. Kerkmann, M., et al., *Activation with CpG-A and CpG-B oligonucleotides reveals two distinct regulatory pathways of type I IFN synthesis in human plasmacytoid dendritic cells*. *J Immunol*, 2003. **170**(9): p. 4465-74.
178. Mrass, P., et al., *Random migration precedes stable target cell interactions of tumor-infiltrating T cells*. *J Exp Med*, 2006. **203**(12): p. 2749-61.
179. Mempel, T.R., et al., *Regulatory T cells reversibly suppress cytotoxic T cell function independent of effector differentiation*. *Immunity*, 2006. **25**(1): p. 129-41.
180. Siu, G., *Controlling CD4 gene expression during T cell lineage commitment*. *Semin Immunol*, 2002. **14**(6): p. 441-51.
181. Hensley, S.E., et al., *Dendritic cell maturation, but not CD8+ T cell induction, is dependent on type I IFN signaling during vaccination with adenovirus vectors*. *J Immunol*, 2005. **175**(9): p. 6032-41.
182. Montoya, M., et al., *Type I interferons produced by dendritic cells promote their phenotypic and functional activation*. *Blood*, 2002. **99**(9): p. 3263-71.
183. Fonteneau, J.F., et al., *Activation of influenza virus-specific CD4+ and CD8+ T cells: a new role for plasmacytoid dendritic cells in adaptive immunity*. *Blood*, 2003. **101**(9): p. 3520-6.
184. Hoshino, K., et al., *Differential involvement of IFN-beta in Toll-like receptor-stimulated dendritic cell activation*. *Int Immunol*, 2002. **14**(10): p. 1225-31.

185. Hoebe, K., et al., *Upregulation of costimulatory molecules induced by lipopolysaccharide and double-stranded RNA occurs by Trif-dependent and Trif-independent pathways*. Nat Immunol, 2003. **4**(12): p. 1223-9.
186. Levy, D.E., I. Marie, and A. Prakash, *Ringling the interferon alarm: differential regulation of gene expression at the interface between innate and adaptive immunity*. Curr Opin Immunol, 2003. **15**(1): p. 52-8.
187. Kikutani, H. and A. Kumanogoh, *Semaphorins in interactions between T cells and antigen-presenting cells*. Nat Rev Immunol, 2003. **3**(2): p. 159-67.
188. Dalod, M., et al., *Interferon alpha/beta and interleukin 12 responses to viral infections: pathways regulating dendritic cell cytokine expression in vivo*. J Exp Med, 2002. **195**(4): p. 517-28.
189. Suto, A., et al., *Murine plasmacytoid dendritic cells produce IFN-gamma upon IL-4 stimulation*. J Immunol, 2005. **175**(9): p. 5681-9.
190. Yamamoto, M., et al., *Regulation of Toll/IL-1-receptor-mediated gene expression by the inducible nuclear protein I kappa B zeta*. Nature, 2004. **430**(6996): p. 218-22.
191. Sarkar, S.N. and G.C. Sen, *Novel functions of proteins encoded by viral stress-inducible genes*. Pharmacol Ther, 2004. **103**(3): p. 245-59.
192. Chin, K.C. and P. Cresswell, *Viperin (cig5), an IFN-inducible antiviral protein directly induced by human cytomegalovirus*. Proc Natl Acad Sci U S A, 2001. **98**(26): p. 15125-30.
193. Yang, G.X., et al., *CD4- plasmacytoid dendritic cells (pDCs) migrate in lymph nodes by CpG inoculation and represent a potent functional subset of pDCs*. J Immunol, 2005. **174**(6): p. 3197-203.
194. Angelov, G.S., et al., *Flt3 ligand-generated murine plasmacytoid and conventional dendritic cells differ in their capacity to prime naive CD8 T cells and to generate memory cells in vivo*. J Immunol, 2005. **175**(1): p. 189-95.
195. Huang, Q., et al., *The plasticity of dendritic cell responses to pathogens and their components*. Science, 2001. **294**(5543): p. 870-5.
196. Krug, A., et al., *Identification of CpG oligonucleotide sequences with high induction of IFN-alpha/beta in plasmacytoid dendritic cells*. Eur J Immunol, 2001. **31**(7): p. 2154-63.
197. Hemmi, H., et al., *The roles of Toll-like receptor 9, MyD88, and DNA-dependent protein kinase catalytic subunit in the effects of two distinct CpG DNAs on dendritic cell subsets*. J Immunol, 2003. **170**(6): p. 3059-64.
198. Honda, K., et al., *Spatiotemporal regulation of MyD88-IRF-7 signalling for robust type-I interferon induction*. Nature, 2005. **434**(7036): p. 1035-40.
199. Guiducci, C., et al., *Properties regulating the nature of the plasmacytoid dendritic cell response to Toll-like receptor 9 activation*. J Exp Med, 2006. **203**(8): p. 1999-2008.
200. Yi, A.K. and A.M. Krieg, *Rapid induction of mitogen-activated protein kinases by immune stimulatory CpG DNA*. J Immunol, 1998. **161**(9): p. 4493-7.
201. Hacker, H., et al., *CpG-DNA-specific activation of antigen-presenting cells requires stress kinase activity and is preceded by non-specific endocytosis and endosomal maturation*. Embo J, 1998. **17**(21): p. 6230-40.
202. Palucka, A.K., et al., *Cross-regulation of TNF and IFN-alpha in autoimmune diseases*. Proc Natl Acad Sci U S A, 2005. **102**(9): p. 3372-7.

203. Klinman, D.M., *Immunotherapeutic uses of CpG oligodeoxynucleotides*. Nat Rev Immunol, 2004. **4**(4): p. 249-58.
204. Krieg, A.M., *Therapeutic potential of Toll-like receptor 9 activation*. Nat Rev Drug Discov, 2006. **5**(6): p. 471-84.
205. Wollenberg, A., et al., *Plasmacytoid dendritic cells: a new cutaneous dendritic cell subset with distinct role in inflammatory skin diseases*. J Invest Dermatol, 2002. **119**(5): p. 1096-102.
206. Muller, W.A. and G.J. Randolph, *Migration of leukocytes across endothelium and beyond: molecules involved in the transmigration and fate of monocytes*. J Leukoc Biol, 1999. **66**(5): p. 698-704.
207. Sallusto, F. and C.R. Mackay, *Chemoattractants and their receptors in homeostasis and inflammation*. Curr Opin Immunol, 2004. **16**(6): p. 724-31.
208. Xie, H., et al., *Acquisition of selectin binding and peripheral homing properties by CD4(+) and CD8(+) T cells*. J Exp Med, 1999. **189**(11): p. 1765-76.
209. Weninger, W., et al., *Migratory properties of naive, effector, and memory CD8(+) T cells*. J. Exp. Med., 2001. **194**(7): p. 953-966.
210. Stein, J.V., et al., *The CC chemokine thymus-derived chemotactic agent 4 (TCA-4, secondary lymphoid tissue chemokine, 6Ckine, exodus-2) triggers lymphocyte function-associated antigen 1-mediated arrest of rolling T lymphocytes in peripheral lymph node high endothelial venules*. J. Exp. Med., 2000. **191**(1): p. 61-76.
211. Wareing, M.D., et al., *Chemokine expression during the development and resolution of a pulmonary leukocyte response to influenza A virus infection in mice*. J Leukoc Biol, 2004. **76**(4): p. 886-95.
212. Garcia-Sastre, A. and C.A. Biron, *Type I interferons and the virus-host relationship: a lesson in detente*. Science, 2006. **312**(5775): p. 879-82.
213. Curtsinger, J.M., et al., *Type I IFNs provide a third signal to CD8 T cells to stimulate clonal expansion and differentiation*. J Immunol, 2005. **174**(8): p. 4465-9.
214. Kolumam, G.A., et al., *Type I interferons act directly on CD8 T cells to allow clonal expansion and memory formation in response to viral infection*. J Exp Med, 2005. **202**(5): p. 637-50.
215. Townsend, A.R., et al., *The epitopes of influenza nucleoprotein recognized by cytotoxic T lymphocytes can be defined with short synthetic peptides*. Cell, 1986. **44**(6): p. 959-68.
216. Price, G.E., A. Gaszewska-Mastarlarz, and D. Moskophidis, *The role of alpha/beta and gamma interferons in development of immunity to influenza A virus in mice*. J Virol, 2000. **74**(9): p. 3996-4003.
217. Garvey, T.L., et al., *Inflammatory responses to pneumovirus infection in IFN-alpha beta R gene-deleted mice*. J Immunol, 2005. **175**(7): p. 4735-44.
218. Klenerman, P. and A. Hill, *T cells and viral persistence: lessons from diverse infections*. Nat Immunol, 2005. **6**(9): p. 873-9.
219. Garcia-Sastre, A., et al., *The role of interferon in influenza virus tissue tropism*. J Virol, 1998. **72**(11): p. 8550-8.
220. Goto, H. and Y. Kawaoka, *A novel mechanism for the acquisition of virulence by a human influenza A virus*. Proc Natl Acad Sci U S A, 1998. **95**(17): p. 10224-8.
221. Marsh, M. and A. Helenius, *Virus entry: open sesame*. Cell, 2006. **124**(4): p. 729-40.

222. Hornung, V., et al., *Replication-dependent potent IFN-alpha induction in human plasmacytoid dendritic cells by a single-stranded RNA virus*. J Immunol, 2004. **173**(10): p. 5935-43.
223. Schlender, J., et al., *Inhibition of toll-like receptor 7- and 9-mediated alpha/beta interferon production in human plasmacytoid dendritic cells by respiratory syncytial virus and measles virus*. J Virol, 2005. **79**(9): p. 5507-15.
224. Diebold, S.S., et al., *Viral infection switches non-plasmacytoid dendritic cells into high interferon producers*. Nature, 2003. **424**(6946): p. 324-8.
225. Fernandez-Sesma, A., et al., *Influenza virus evades innate and adaptive immunity via the NS1 protein*. J Virol, 2006. **80**(13): p. 6295-304.
226. Geiss, G.K., et al., *Cellular transcriptional profiling in influenza A virus-infected lung epithelial cells: the role of the nonstructural NS1 protein in the evasion of the host innate defense and its potential contribution to pandemic influenza*. Proc Natl Acad Sci U S A, 2002. **99**(16): p. 10736-41.
227. O'Garra, A. and G. Trinchieri, *Are dendritic cells afraid of commitment?* Nat Immunol, 2004. **5**(12): p. 1206-8.
228. Langenkamp, A., et al., *Kinetics of dendritic cell activation: impact on priming of TH1, TH2 and nonpolarized T cells*. Nat Immunol, 2000. **1**(4): p. 311-6.
229. von Andrian, U.H., *Intravital microscopy of the peripheral lymph node microcirculation in mice*. Microcirculation, 1996. **3**(3): p. 287-300.
230. Mempel, T.R., et al., *In vivo imaging of leukocyte trafficking in blood vessels and tissues*. Curr Opin Immunol, 2004. **16**(4): p. 406-17.
231. Bonasio, R., et al., *Clonal deletion of thymocytes by circulating dendritic cells homing to the thymus*. Nat Immunol, 2006. **7**(10): p. 1092-100.
232. Smalley, D.M. and K. Ley, *L-selectin: mechanisms and physiological significance of ectodomain cleavage*. J Cell Mol Med, 2005. **9**(2): p. 255-66.
233. Venturi, G.M., et al., *Leukocyte migration is regulated by L-selectin endoproteolytic release*. Immunity, 2003. **19**(5): p. 713-24.
234. Walcheck, B., et al., *Neutrophil rolling altered by inhibition of L-selectin shedding in vitro*. Nature, 1996. **380**(6576): p. 720-3.
235. Faveeuw, C., G. Preece, and A. Ager, *Transendothelial migration of lymphocytes across high endothelial venules into lymph nodes is affected by metalloproteinases*. Blood, 2001. **98**(3): p. 688-95.
236. Galkina, E., et al., *L-selectin shedding does not regulate constitutive T cell trafficking but controls the migration pathways of antigen-activated T lymphocytes*. J Exp Med, 2003. **198**(9): p. 1323-35.
237. Cahalan, M.D., et al., *Two-photon tissue imaging: seeing the immune system in a fresh light*. Nat Rev Immunol, 2002. **2**(11): p. 872-80.
238. Sumen, C., et al., *Intravital microscopy: visualizing immunity in context*. Immunity, 2004. **21**(3): p. 315-29.
239. Bousso, P. and E. Robey, *Dynamics of CD8(+) T cell priming by dendritic cells in intact lymph nodes*. Nat. Immunol., 2003. **4**(6): p. 579-585.
240. Lindquist, R.L., et al., *Visualizing dendritic cell networks in vivo*. Nat Immunol, 2004. **5**(12): p. 1243-50.

241. Willis, R.A., et al., *Dendritic cells transduced with HSV-1 amplicons expressing prostate-specific antigen generate antitumor immunity in mice*. Hum Gene Ther, 2001. **12**(15): p. 1867-79.
242. Barchet, W., et al., *Virus-induced interferon alpha production by a dendritic cell subset in the absence of feedback signaling in vivo*. J Exp Med, 2002. **195**(4): p. 507-16.
243. Barchet, W., et al., *Dendritic cells respond to influenza virus through TLR7- and PKR-independent pathways*. Eur J Immunol, 2005. **35**(1): p. 236-42.
244. Jung, S., et al., *In vivo depletion of CD11c(+) dendritic cells abrogates priming of CD8(+) T cells by exogenous cell-associated antigens*. Immunity, 2002. **17**(2): p. 211-20.
245. Dahl, M.E., et al., *Viral-induced T helper type 1 responses enhance allergic disease by effects on lung dendritic cells*. Nat Immunol, 2004. **5**(3): p. 337-43.
246. von Andrian, U.H. and B. Engelhardt, *Alpha4 integrins as therapeutic targets in autoimmune disease*. N Engl J Med, 2003. **348**(1): p. 68-72.
247. Kogan, A.N. and U.H. von Andrian, *Adhesion and communication between lymphocytes and endothelial cells*, in *Molecular Basis of Microvascular Disorders*, G.W. Schmid-Schonbein and D.N. Granger, Editors. 2001, Springer Verlag.