Department of Pathology
Brigham and Women's Hospital

FACULTY BIOGRAPHY

Name: Manfred Brigl Degree(s): M.D.
Title(s): Assistant Professor of Pathology
Associate Medical Director, Clinical Microbiology
Director, Molecular Microbiology
Building Location: 221 Longwood Ave, EBRC 421
Tel: 617-525-8825 Fax:
Email: mbrigl@partners.org
Research Interests: Role and function of innate-like T cells (CD1d-restricted NKT cells, CD1a/b/c-restricted T cells, and MR1-restricted MAIT cells) in microbial infection and inflammation

Research Summary (Past/Current):

Our lab is interested in understanding the role and function of innate-like T cells in immunity to infection and other inflammatory conditions. Innate-like T cells such as Natural Killer T (NKT) cells or Mucosal-Associated Invariant T (MAIT) cells recognize non-peptide antigens presented by evolutionarily conserved non-polymorphic MHC-like antigen presenting molecules. NKT cells (type I and II) recognize self- and microbial lipid antigens presented by CD1d molecules, and can have either protective or harmful roles in diverse pathological states, including microbial infection, autoimmunity, allergy, and tumor immunity. The profound immunomodulatory potential of NKT cells stems from the unique way in which they combine both classically innate and classically adaptive immunological features. MAIT cells are particularly abundant in intestinal mucosa of humans and recognize microbial vitamin metabolites. The goal of our research is to better understand the mechanisms underlying the activation of innate-like T cells, and how microbial and self-antigens, the inflammatory milieu and interactions with other immune cell subsets regulate the functions of innate-like T cells in antimicrobial responses, allergy, autoimmunity, and tolerance. We are currently isolating T cell receptors (TCRs) of innate-like T cells and use these TCRs to generate novel TCR retrogenic mouse models to study the role and function of innate-like T cells in vivo.

Recent Publications:

1. Brigl M, Tatituri RV, Watts GFM, Bhowruth V, Leadbetter EA, Baron N, Cohen NR, Hsu FF, Besra GS, Brenner MB. Innate and cytokine-driven signals rather than microbial antigens dominate in Natural Killer T cell activation during microbial infection. J Exp Med. 2011; 208:1163-77.

2. Brennan PJ, Brigl M, Brenner MB. Invariant natural killer T cells: an innate activation scheme linked to diverse effector functions. Nat Rev Immunol. 2013, 13:101-17.

3. Tatituri RV, Watts GF, Bhowruth V, Barton N, Rothchild A, Hsu FF, Almeida CF, Cox LR, Eggeling L, Cardell S, Rossjohn J, Godfrey DI, Behar SM, Besra GS, Brenner MB, Brigl M. Recognition of microbial and mammalian phospholipid antigens by NKT cells with diverse TCRs. Proc Natl Acad Sci USA. 2013, 1827-32.

Future Research Directions / Areas Looking For Scientific Synergies:

- Role of type II NKT cells in M. tuberculosis infection
- Role of MAIT cells in intestinal infection and inflammation
- Mechanism of activation of type I NKT cells during Aspergillus fumigatus-induced airway hyperreactivity