

# ImmunoTools IT-Box-139 Award 2012



**Jianwei Wang**

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## **BATF defines a differentiation checkpoint limiting hematopoietic stem cell self renewal in response to DNA damage**

Checkpoints that limit stem cell self-renewal in response to DNA damage can contribute to cancer protection but may also promote impairments in tissue maintenance and function during aging. The molecular components that control stem cell responses to DNA damage remain yet to be delineated. Using in vivo RNAi (shRNA) screens, we show that DNA damage limits self-renewal of hematopoietic stem cells (HSCs) by upregulation of the “Basic leucine zipper transcription factor, ATF-like” (BATF). The study shows that BATF is required for the induction of lymphoid lineage differentiation in normal, non-damaged HSCs. DNA damage enhances differentiation of HSCs by inducing BATF expression in a G-CSF/STAT3 dependent manner. Inhibition of this pathway ameliorates HSC depletion in response to  $\alpha$ irradiation or telomere dysfunction. An analysis of bone marrow biopsies of patients with myelodysplastic syndromes indicates that DNA damage dependent induction of BATF is conserved in human HSCs. Together, these results provide the first experimental evidence that BATF controls lymphoid differentiation of HSCs and this molecular circuit serves as a checkpoint limiting the self-renewal of HSCs in response to DNA damage.

**ImmunoTools** antibodies from the IT-Box-139 will be used to purify subpopulation of human HSC to test whether they are age dependent.

### **ImmunoTools** IT-Box-139 for Jianwei Wang includes 100 antibodies

**FITC** - conjugated anti-human CD1a, CD3, CD4, CD5, CD6, CD7, CD8, CD14, CD15, CD16, CD19, CD21, CD25, CD29, CD35, CD36, CD41a, CD42b, CD45, CD45RA, CD45RB, CD45RO, CD49d, CD53, CD57, CD61, CD63, CD80, CD86, HLA-DR, IL-6, Control-IgG1, Control-IgG2a, Control-IgG2b, Annexin V

**PE** - conjugated anti-human CD3, CD4, CD8, CD11b, CD15, CD14, CD18, CD19, CD20, CD21, CD22, CD31, CD33, CD38, CD40, CD45, CD45RB, CD50, CD52, CD56, CD58, CD62p, CD72, CD95, CD105, CD147, CD177, CD235a, HLA-ABC, IL-6, Control-IgG1, Control-IgG2a, Control-IgG2b, Annexin V

**PE/Dy647** -tandem conjugated anti-human CD3, CD4, CD8, CD14, CD19, CD20, CD25, CD54

**APC** -conjugated anti-human CD2, CD3, CD4, CD8, CD10, CD11a, CD11c, CD14, CD16, CD27, CD37, CD42b, CD44, CD45, CD59, CD62L, CD69, CD71, IL-6, Control-IgG1, Control-IgG2a, Control-IgG2b, Annexin V

[DETAILS](#)