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Education and Training

Rhodes College, Memphis, TN, 1976 B.S. Biology

Louisiana State University, Baton Rouge, LA, 1990 M.S. Zoology

Louisiana State University, Baton Rouge, LA, 1993 PhD. Zoology

NIEHS, Research Triangle Park, NC 1996-1998 Postdoctoral DNA repair

U.T. M.D. Anderson Cancer Center, Houston, TX 1998-2000 Postdoctoral Developmental Biology

Biosketch

My laboratory is identifying gene regulatory mechanisms that control hematopoietic progenitor choice between multipotency and differentiation during steady state conditions and in response to stress in the fly. A primitive *Drosophila* hematopoietic progenitor with the characteristics of mammalian hematopoietic stem and progenitor cells (HSPCs) including multipotency, niche-responsiveness and quiescence was identified by two different labs in 2007. This enabled investigations of HSPC regulation using the genetically tractable *Drosophila* system. We have identified a number of novel interactions between conserved regulators during steady-state hematopoiesis and in response to stress. More recently, we have contributed to the growing consensus that inflammatory signaling pathways regulate HSPCs during steady state conditions. We showed that the NF- κ B homolog, Dorsal, regulates the size of the HSPC pool during steady-state hematopoiesis. Furthermore, Dorsal downregulates FOG to promote blood cell differentiation in response to stress.

Research/Clinical Keywords

Hematopoiesis, Stem/progenitor cells, genetics, *Drosophila*, gene regulation

Highlighted Publications

Gao, H., Wu, X., Fossett, N. (2009) Upregulation of the *Drosophila* Friend of GATA gene u-shaped by JAK/STAT signaling maintains lymph gland prohemocyte potency. *Mol. Cell Bio.*, 29, 6086–6096. PMID: 19737914 PMCID: PMC2772570

Gao, H., Wu, X., Fossett, N. (2013) *Drosophila* E-cadherin functions in hematopoietic progenitors to maintain multipotency and block differentiation. *PLoS ONE* 8:e74684. PMID: 24040319 PMCID: PMC3764055

Fossett, N. (2013) Signal transduction pathways, intrinsic regulators, and the control of cell fate choice. *Biochim. Biophys. Acta* 1830, 2375–2384. PMID: 22705942 PMCID: PMC3477240

Gao H, Wu X, Simon L, Fossett N. (2014) Antioxidants maintain e-cadherin levels to limit *Drosophila* prohemocyte differentiation. *PLoS ONE* 9:e107768. PMID:25226030 PMCID: PMC4167200

Gao H, Baldeosingh R, Wu X, Fossett N. (2016) The Friend of GATA Transcriptional Co-Regulator, U-Shaped, Is a Downstream Antagonist of Dorsal-Driven Prohemocyte Differentiation in *Drosophila*. *PLoS ONE* 11:e0155372. PMCID: PMC4862636

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