



## Research & Training Programs Brochure

[< Brochure Homepage](#)

[Faculty Index](#) | [Pathology Homepage](#) | [Contact Us](#)

### Division of Transfusion Medicine



#### Paul M. Ness, M.D.

**Director, Division of Transfusion Medicine**  
**Primary Appointment in Pathology; Secondary Appointments in Medicine, Oncology**

In recent years our laboratory has emphasized development of assays for detecting red cell antibodies and small populations of heterogeneous red cells using a quantitative enzyme-linked antiglobulin test. This assay has proved useful in the study of fetal-maternal hemorrhage, red cell survival studies, and autoimmune hemolytic anemia. We have also studied the pathophysiology of delayed hemolytic transfusion reactions using a rabbit model and are undertaking studies of red cell alloimmunization in mice. Ongoing clinical studies in transfusion medicine include the use of hemodilution in elective surgery, assessment of the risk of viral and bacterial infections in blood recipients, research on the recurrence of cancer as related to the immuno suppressive effects of blood transfusions, the development and use of hemoglobin-based oxygen carriers as blood substitutes, and several projects on international blood safety in China and Thailand.

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#### Publications

Ness PM, Walsh PC, Zahurak M., Baldwin ML, Piantadosi S. Prostate cancer recurrence in radical surgery patients receiving autologous or homologous blood. *Transfusion* 32: 31-36, 1992.

Ness PM, Braine HG, King KE, Barrasso C, Kickler TS, Fuller A, Blades NJ. Single donor platelets reduce the risk of septic platelet transfusion reactions. *Transfusion* 41; 857-861, 2001.

Ness PM, Shirey RS, Weinstein MH, King KE. An animal model for delayed hemolytic transfusion reactions. *Transfusion Medicine Reviews* 15: 305-317, 2001.

Anderson KC, Ness PM. Scientific basis of transfusion medicine: Implications for clinical practice. Second Edition, WB Saunders, Philadelphia PA 1999.



## Sally Campbell-Lee, M.D.

[Top of Page](#)

### Primary Appointment in Pathology

My research focuses on immune mechanisms of red blood cell alloimmunization. I am seeking to identify processes that can be interfered with in order to treat or prevent alloimmunization in patients at risk, such as chronically transfused sickle cell disease patients. My current work is with a murine model of red cell alloimmunization using transgenic mice that express human red cell antigens. This model is being used to examine whether interventions such as leukodepletion or blockade of the CD28-B7 co stimulatory pathway with CTLA4lg impact red cell alloantibody formation.

### Publications

Campbell-Lee S, DeSantis-Parsons D, Shirey RS, Kickler TS. Neonatal alloimmune thrombocytopenia due to anti-HPA-5b (Bra). *Immunohematology* 19:127-131, 2003.

Campbell-Lee S, Ness PM, Baldwin W. The production of red blood cell alloantibodies in Balb/b mice immunized with red blood cells from C57BL/10 mice. *Blood* 100(11)Suppl 1,p 286a, 2001.

Campbell-Lee, SA and Ness, PM "Red Blood Cell Concentrates and Related Products" in *Blood Banking and Transfusion Medicine: Basic Principles & Practice*, Hillyer, Silberstein, Ness, and Anderson, eds. Churchill Livingstone, Philadelphia, PA, 2002

Boulware LE, Cooper L, LaVeist T, Ness P, Campbell-Lee S, Ratner L, Powe N. The contribution of sociodemographic, medical, and attitudinal factors to blood donation among the general public. *Transfusion* 42:669-678, 2002.

Campbell, SA, Shirey RS, King KE, Ness PM. An acute hemolytic transfusion reaction due to anti-IH in a patient with sickle cell disease. *Transfusion* 40:828-831, 2000

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### Related Websites

[Division of Transfusion Medicine](#)



## Deborah K. Douglas, M.D.

[Top of Page](#)

### Primary Appointment in Pathology

My primary research focuses on adverse transfusion reactions, including allergic transfusion reactions. This avenue of investigation includes not only the underlying etiology of allergic reactions to blood products, but also the indications for appropriate treatment and prevention. In addition, I am investigating transfusion guidelines and reactions in the unique subpopulation of burn patients. Additional avenues of investigation include the infectious complications of transfusion, and safety measures to prevent transfusion reactions, including the regulatory and risk management aspects of adverse transfusion-related patient events. Research efforts are thus directed at enhancing patient safety in Transfusion Medicine.

## Publications

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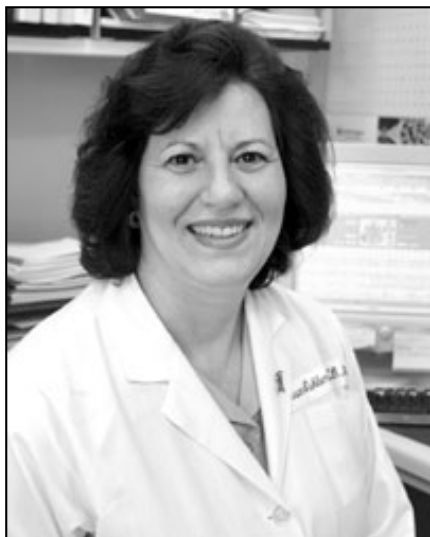
Krumholz A, Ness P, Hauser W, Douglas, D. Adverse Reactions in Blood Donors with History of Seizures or Epilepsy. *Transfusion* 35: 470-474, 1995.

Ness P, Douglas D, Koziol D, Polk, BF: Decreasing Seroprevalence of Human Immunodeficiency Virus (HIV I) in a Regional Blood Donor Population. *Transfusion* 30: 201-206, 1990.

Ness P, Douglas D. Declining Prevalence of HIV Seropositive Blood Donors. *New England Journal of Medicine* 31: 615. 1989

Williams A, Fang C, Salamon D, Poiesz, B, Sandler S, Darr W, Shulman G, McGowan E, Douglas D. Seroprevalence and Epidemiologic Correlates of HTLV-1 Infection in American Blood Donors. *Science* 240: 643-646, 1988.

Ward J, Kleinman S, Douglas D. Epidemiologic Characteristics of Blood Donors Who Have Antibody to the Human Immunodeficiency Virus. *Transfusion* 28, 4: 298-301, 1988.



### Susan H. Eshleman, M.D., Ph.D.

[Top of Page](#)

#### Primary Appointment in Pathology

Member, Graduate Program in Cellular and Molecular Medicine; Member, Graduate Program in Pathobiology

The HIV-1 viruses in an infected individual are genetically diverse and evolve at a rapid rate in response to selective pressures. My laboratory studies HIV-1 diversity and its impact on HIV-1 infection and viral fitness. Major areas of interest of the laboratory include HIV-1 mother-to-child transmission and HIV-1 drug resistance. We are also involved in both national and international clinical trials of HIV-1 treatment and prevention.

#### Publications

Eshleman SH, Becker-Pergola G, Deseyve M, Guay LA, Mracna M, Fleming T, Cunningham S, Musoke P, Mmiro F, and Jackson JB. Impact of human immunodeficiency type 1 (HIV-1) subtype on women receiving single-dose nevirapine prophylaxis to prevent HIV-1 vertical transmission (HIV Network for Prevention Trials 012 Study). *J Infect Dis.* (2001) 184:914-917.

Eshleman SH, Guay LA, Fleming T, Mwatha A, Mracna M, Becker-Pergola G, Musoke P, Mmiro F, and Jackson JB. Survival of Ugandan infants with subtype A and D HIV-1 infection (HIVNET 012). *J AIDS* (2002) 31:327-330.

Eshleman SH, Guay LA, Mwatha A, Cunningham SP, Brown ER, Musoke P, Mmiro F, and Jackson JB. Comparison of nevirapine (NVP) resistance in Ugandan women 7 days vs. 6-8 weeks after single dose NVP prophylaxis: HIVNET 012. *AIDS Res Human Retroviruses* (2004) 20:595-597.

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Shi C, Eshleman SH, Jones D, Fukushima N, Hua L, Parker AR, Yeo CJ, Hruban RH, Goggins MG, and Eshleman JR. LigAmp: Sensitive detection of single nucleotide differences. *Nature Methods* (2004) 1:141-147.



## J. Brooks Jackson, M.D., M.B.A.

[Top of Page](#)

**Baxley Professor and Director of Pathology  
Member, Graduate Program in Pathobiology**

My research is focused on the clinical application of several qualitative and quantitative HIV-1 detection assays for the purpose of 1) studying perinatal, sexual, and transfusion-associated HIV transmission and 2) monitoring HIV infection pre and post antiretroviral therapy. Laboratory assays for the detection and quantitation of HIV include Western blot analysis, HIV culture, p24 antigen levels, and quantitation of HIV DNA and RNA by PCR. Drug susceptibility and neutralizing antibody assays are also employed. These methods are extremely helpful in evaluating new antiviral drugs, understanding modes and frequency of HIV transmission, and understanding the pathogenesis of HIV-1 infection. Trials using HIV immune globulin, AZT, and nevirapine to prevent HIV vertical transmission in Uganda are also underway.

### Publications

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Jackson JB, Barnett S, Piwowar-Manning E, Apuzzo L, Raines C, Hendrix C, Hamzeh F, Gallant J. A Phase I/II study of nevirapine for pre-exposure prophylaxis of HIV-1 transmission in uninfected subjects at high risk. *AIDS* 2003; 17:547-553.

Piwowar-Manning E, Henderson TA, Brisbin L, Jackson JB. A modified ultrasensitive assay to detect quantified HIV-1 RNA levels less than 50 copies/ml. *Am J Clin Pathol* 2003;120:268-270.

Jackson JB, Musoke P, Fleming T, Guay L, Bagenda D, Allen M, Nakabiito C, Sherman J, Bakaki P, Owor M, Ducar C, Deseyve M, Emel L, Duefield C, Mirochnick M, Fowler MG, Mofenson L, Miotti P, Gigliotti M, Bray D, Mmiro F. Intrapartum and neonatal single-dose nevirapine compared with zidovudine for prevention of mother-to-child transmission of HIV-1 in Kampala, Uganda: 18 months follow-up of the HIVNET 012 randomised trial. *Lancet* 2003;362:859-868.

Jackson JB, Piwowar-Manning E, Johnson-Lewis L, Bassett R, Demeter LM, Brambilla D. Comparison of 1.0 and 1.5 version ultrasensitive AMPLICOR HIV-1 MONITOR test in subjects with low viral load. *J Clin Microbiol* 2004;42:2774-2776.



## Karen E. King, M.D.

**Primary Appointment in Pathology; Secondary Appointment in Oncology**

My research is focused in two areas: 1) the problem of alloimmunization due to either multiple transfusions or fetal maternal incompatibility and 2) novel indications for apheresis. My interests involve the clinical complications related to red cell alloimmunization, specifically delayed hemolytic transfusion reactions and the phenomenon of bystander hemolysis. I am particularly interested in the transfusion related issues which complicate the course of patients with sickle cell disease, especially those issues due to alloimmunization and multiple transfusions. In the Hemapheresis and Transfusion Support (HATS) service, our resources include apheresis technology and staff skilled in performing therapeutic and donor apheresis. We also provide outpatient donor and transfusion services. Our platelet coordinators manage platelet transfusion therapy for multitransfused, refractory patients. The translational aspects of this service facilitate close interactions with research and clinical investigators in many fields. Currently, one very successful collaboration involves the development of clinical protocols for kidney transplantation across HLA and ABO barriers. We are also involved in clinical trials of novel apheresis technologies and we are participating in the Transfusion Medicine/Hemostasis Clinical Trial Network sponsored by NHLBI.

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### Publications

King KE, Shirey RS, Lankiewicz MW, Young-Ramsaran J, Ness PM. Delayed hemolytic transfusion reactions in sickle cell disease: simultaneous destruction of recipients' red cells. *Transfusion* 1997;37:376-381.

Ness PM, Shirey RS, Weinstein MH, King KE. An animal model for delayed hemolytic transfusion reactions. *Transfusion Medicine Reviews* 2001;15:305-317.

Shirey RS, Boyd JA, Parwani AV, Tanz WS, Ness PM, King KE. Prophylactic antigen-matched donor blood for patients with warm autoantibodies: an algorithm for transfusion management. *Transfusion* 2002;42:1435-1441.

King KE, Shirey RS, Thoman SK, Bensen-Kennedy D, Tanz WS, Ness PM. Universal leukoreduction decreases the incidence of febrile non-hemolytic transfusion reactions to RBCs. *Transfusion* 2004;44:25-29.

Sonnenday CJ, Warren DS, Cooper M, Samaniego M, Haas M, King KE, Shirey RS, Simpkins CE, Montgomery RA. Plasmapheresis, CMV hyperimmune globulin, and anti-CD20 allow ABO-incompatible renal transplantation without splenectomy. *Am J Transplant* 2004;4:1315-1322.





## Hua Shan, M.D., Ph.D.

### Primary Appointment in Pathology

The risk of transfusion transmitted infections (TTI, including HIV, HBV and HCV) has decreased significantly in recent years in developed countries. Unfortunately, many developing countries still have TTI risk levels that are significantly higher than developed countries. My recent works have been focused on developing collaborative research programs with international blood centers with the purpose of identifying ways to improve international blood safety.

Donor follow-up case controlled studies have been carried out in blood centers in Beijing and Urumqi, China to identify risk factors associated with donor HIV and HCV infections. The reported common risk factors among donors in the United States include a history of injection drug abuse (IDU) and a history of blood transfusion before 1990. Our preliminary findings from Chinese blood centers revealed the history of blood (whole blood or plasma) donation prior to 1995 as a leading risk factor for both HIV and HCV infections. The current donor deferral criteria used at Chinese blood centers does not defer donors with donation history prior to 1995. Based on our findings, we are proposing changes to the existing donor deferral criteria to more effectively prevent high-risk donors from entering the donor pool.

We are conducting a multi-blood center study using the nucleic acid based donor test (NAT) to evaluate the prevalence, incidence, and the residual risk level of HIV and HCV in China. We also recently completed a knowledge, attitude and practice (KAP) survey in Urumqi, China to gain better understanding of potential donors in order to develop more effective donor recruitment methods. We are also currently conducting a study in Beijing searching for inexpensive HCV confirmatory methods (instead of the RIBA test, as used in developed countries) that can be used in resource-poor countries.

### Publications

Hua Shan and Ping Zhang. Viral Attack On Blood Collection: The Experience From Beijing During The SARS Epidemic. 2004. *Transfusion*; 44: 467-469

Lynn Mattis, Hua Shan , Eric Powell, Sue Shirey and Maria Oliva-Hemker. Life threatening ceftriaxone-induced hemolytic anemia in a child with Crohn's disease. *Clinical Pediatrics* 2004;43:175-178

SARS epidemiological survey among blood donors, Guojing Gao, Yan Qiu, Ping Zhang, Hua Shan et al, *Chinese Journal of Blood Transfusion*, 2003, Vol.16. No. 4 (223-226)

Shan H, Piwowar-Manning E, Thompson RE, Brooks Jackson J. HIV-1 plasma RNA level and CD4 cell count in a large urban HIV-1-infected patient population from 1997 to 2000. *Int J STD AIDS*. 2003 Nov;14(11):740-4.

Hua Shan, Jing-Xing Wang, Fu-Rong Ren, Yuan-Zhi Zhang, Hai-Yan Zhao, Guo-Jing Gao, Yang Ji and Paul M Ness. Blood Banking in China. *The Lancet*. 2002 Vol 360. No. 9347:1770-1775

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