Karl Boynton Seydel

Business Addresses: West Fee Hall, Room B-305, COM, MSU, East Lansing, MI 48824
Blantyre Malaria Project, P.O. Box 32256, Chichiri, Blantyre 3, Malawi
email: seydel@msu.edu

Education:

1985-1988	B.S. Biological Sciences, Stanford University, Stanford, CA
1987-1989	M.S. Biological Sciences, Stanford University, Stanford, CA
1990-1999	M.D./Ph.D. Washington University, St. Louis, Missouri Division of Biology and Biomedical Sciences Medical Scientist Training Program
1999-2000	Internal Medicine Internship, Stanford University Hospital, Stanford, CA

Honors and Awards:

Bachelors degree granted with distinction. Awarded to top 10% of graduates by GPA

Bachelors degree granted with honors. Required undergraduate thesis and participation in honors courses.

Medical Scientist Training Program Fellowship, Washington University; 1990-1999.

Trainee Investigator Award, American Federation for Clinical Research Meeting, 1996.

Second Runner-Up Student Abstract Award, American Gastroenterology Meeting, San Francisco, CA, 1996

Jacques Bronfenbrenner Award for Infectious Disease Research, Washington University Medical School, 1999

Teaching Experience:

Teaching Assistant, Introduction to Biological Sciences-Human Physiology, Washington University.

Medical Licensure:

State of Maryland, Countries of Malawi and Zambia

Professional Experience:

1987-1989	Laboratory Assistant, Division of Immunology & Rheumatology, Department of Medicine, Stanford University.
1989	Undergraduate Honors Thesis: The use of anti-CD4 monoclonal antibodies to prevent pancreatic islet allograft rejection. Advisor: Dr. C. Garrison Fathman, Stanford University.
1989-1990	Research Assistant, Division of Immunology & Rheumatology, Stanford University. Project: Use of anti-CD4 monoclonal antibodies to prevent the rejection of cardiac allografts in rats. Laboratory of Dr. Fathman, Stanford University.

	1990-1999	Pre-doctoral fellow, Medical Scientist Training Program. Washington University, St. Louis, MO Thesis project: Characterization of the immunopathology of *E. histolytica* in liver and intestinal disease models. Laboratory of Samuel L. Stanley, Jr.
	2000-2006	Postdoctoral Fellow, Laboratory of Louis Miller, Malaria Cell Biology Section, Laboratory of Malaria and Vector Research, National Institute of Health, Bethesda, Maryland.
	2006-present	Assistant Professor, Department of Internal Medicine, College of Osteopathic Medicine, Michigan State University, East Lansing, MI.

International Experience:	1/99-3/99	Medical Student Rotation, Queen Elizabeth Children's Hospital, Blantyre, Malawi.
	3/99-6/99	Medical Student Rotation, Shaukat Khanum Memorial Hospital, Lahore, Pakistan.
	7/2000	Internal Medicine Residency Rotation, Mondana Medical Clinic, Ecuador.
	1/04-7/04	Clinical Volunteer, Blantyre Malaria Project, Blantyre, Malawi.
	1/06-present	Research Clinician Blantyre Malaria Project, Blantyre, Malawi.

Financial Support:

NIH K23 - 1K23AI079402 – 01 Using primary endothelial and parasite isolates to study sequestration in malaria July 1, 2008 – June 30, 2011. $134,514 per year.

Refereed Manuscripts:

1. Shizuru, J.A. , **Seydel, K.B.** , Flavin, T.F. , Wu, A.P. , Kong, C.C. , Hoyt, E.G. , Fujimoto, N. , Billingham, M.E., Starnes, V.A. , and Fathman, C.G. 1990. Induction of donor-specific unresponsiveness to cardiac allografts in rats by pretransplant anti-CD4 monoclonal antibody therapy. *Transplantation.* 50: 366-73.

2. Flavin, T. , Shizuru, J. , **Seydel, K**. , Wu, A. , Fujimoto, N. , Hoyt, E.G. , Ivens, K. , Billingham, M. , Fathman, C.G. ,and Starnes, V.A. 1990. Selective T-cell depletion with Ox-38 anti-CD4 monoclonal antibody prevents cardiac allograft rejection in rats. *J. Heart Trans*. 9:482-8.

3. **Seydel, K**. , Shizuru, J. , Grossman, D. , Wu, A. , Alters, S. , and Fathman, C.G. 1991. Anti-CD8 abrogates effect of anti-CD4-mediated islet allograft survival in rat model. *Diabetes*. 40:1430-4.

4. Alters, S. , Shizuru, J.A. , Ackerman, J. , Grossman, D. , **Seydel, K.B.** , and Fathman, C.G. 1991. Anti-CD4 mediates clonal anergy during transplantation tolerance induction. *J. Exp. Med*. 173:491-4.

5. **Seydel, K.B.** , Braun, K.L. , Zhang, T. , Jackson, T. F. , and Stanley, S.L. Jr. 1996. Protection against amebic liver abscess formation in the severe combined immunodeficient mouse by human anti-amebic antibodies. *Am. J. Trop. Med. & Hyg.* 55: 330-2.

6. **Seydel, K.B.** , Li, E. , Swanson, P.E. , and Stanley, S.L. Jr. 1997. Human intestinal epithelial cells produce proinflammatory cytokines in response to infection in a SCID mouse-human intestinal xenograft model of amebiasis. 1997. *Infect. Immun*. 65:1631-9.

7. Lotter, H. , Zhang, T. , **Seydel, K.B.**, Stanley, S.L. Jr. , and Tannich, E. 1997. Identification of an epitope on the *Entamoeba histolytica* 170-kD lectin conferring antibody-mediated protection against invasive amebiasis. *J. Exp. Med*. 185:1793-801.

8. **Seydel, K.B.** , Zhang, T. , and Stanley, S.L. Jr. 1997. Neutrophils play a critical role in early resistance to amebic liver abscesses in severe combined immunodeficient mice. *Infect. Immun*. 65:3951-3.

9. **Seydel, K.B.** Li, E., Zhang, Z., and Stanley, S.L. Jr. 1998. Epithelial cell-initiated inflammation plays a crucial role in early tissue damage in amebic infection of human intestines. *Gastroenterology*. 115:1446-53.

10. **Seydel K.B.** and Stanley, S.L. Jr. 1998. Entamoeba histolytica induces host cell death in amebic liver abscess by a non-Fas-dependent, non-tumor necrosis factor alpha-dependent pathway of apoptosis. *Infect. Immun* 66:2980-3.

11. **Seydel, K.B.**. Zhang, T. Champion, G.A., Fichtenbaum, C., Swanson, P.E., Tzipori, S., Griffiths, J.K., Stanley, S.L., Jr. 1998. Cryptosporidium parvum infection of human intestinal xenografts in SCID mice induces production of human tumor necrosis factor alpha and interleukin-8. *Infect. Immun*. 66:2379-82.

12. **Seydel, K.B**., Smith ,S. J., and Stanley, S.L.Jr. 2000. Interferon-gamma and nitric oxide are required for host defense in murine model of amebic liver abscess. *Infect. Immun.* 68:400-2.

13. Zhang Z, Wang, L. , **Seydel, K.B**., Li, E., Ankri S., Mirelman, D. and Stanley, S.L. Jr. 2000. Entamoeba histolytica cysteine proteinases with interleukin-1 beta converting enzyme (ICE) activity cause intestinal inflammation and tissue damage in amoebiasis. *Mol. Microbiol.* 37:542-8.

14. Zhang, Z. , Jin, L. , Champion, G. , **Seydel, K.B.** and Stanley, S.L. Jr. 2001. Shigella infection in a scid mouse-human intestinal xenograft model: role for neutrophils in containing bacterial dissemination in human intestine. *Infect. Immun*. 69:3240-7.

15. Samaan, R., Nemes, A., Pearce, K., Matheny, S., Crockett, S., **Seydel, K.** (2001) Ambulatory Diagnoses-Cluster Statistics of Patient Visits at a Clinic in the Amazon Region of Ecuador. *Rural and Remote Health 1*, http://rrh.deakin.edu.au

16. Nagao, E., **Seydel, K.B.** and Dvorak, J.A. 2002. Detergent-resistant erythrocyte membrane rafts are modified by a *Plasmodium falciparum* infection. *Exp. Parsitol.* 102:57-9.

17. Sijwali, P.S., Kato, K., **Seydel, K.B**., Gut, J., Lehman, J., Klemba, M., Goldberg, D.E., Miller, L.H. and Rosenthal, P.J. 2004. *Plasmodium falciparum* cysteine protease falcipain-1 is not essential in erythrocytic stage malaria parasites. *PNAS*. 101:8721-6.

18. **Seydel, K.B**., Gaur, D., Aravind, L., Subramanian, G., and Miller, L.H. 2005. *Plasmodium falciparum*: characterization of a late asexual stage Golgi protein containing both ankyrin and DHHC domains. *Exp. Parasitol.* 110:389-93.

19. **Seydel, K.B**., Milner, D.A. Jr., Kamiza, S.B., Molyneux, M.E., and Taylor, T.E. 2006. The distribution and intensity of parasite sequestration in comatose Malawian children. *Journal of Infectious Diseases.* 194:208-215.

20. Francischetti IM, **Seydel KB**, Monteiro RQ, Whitten RO, Erexson CR, Noronha AL, Ostera GR, Kamiza SB, Molyneux ME, Ward JM, Taylor TE. 2007. *Plasmodium falciparum*-infected erythrocytes induce tissue factor expression in endothelial cells and support the assembly of multimolecular coagulation complexes. *J Thromb Haemost*. 5(1):155-65.

21. Mu J, Awadalla P, Duan J, McGee KM, Keebler J, **Seydel K**, McVean GA, Su XZ. 2007. Genome-wide variation and identification of vaccine targets in the *Plasmodium falciparum* genome. *Nat Genet*. 39(1):126-30.

22. Birbeck GL, Molyneux ME, Kaplan PW, **Seydel KB**, Chimalizeni YF, Kawaza K, Taylor TE. 2010. Blantyre Malaria Project Epilepsy Study (BMPES) of neurological outcomes in retinopathy-positive paediatric cerebral malaria survivors: a prospective cohort study. *Lancet Neurol*. 9(12):1173-81.

23. Conroy AL, Phiri H, Hawkes M, Glover S, Mallewa M, **Seydel KB**, Taylor TE, Molyneux M, Kain KC. 2010. Endothelium-based biomarkers are associated with cerebral malaria in Malawian children: a retrospective study. *PLoS One*. 5(12):e15291.

24. Herricks T, **Seydel KB**, Turner G, Molyneux M, Heyderman R, Taylor T, Rathod PK. A microfluidic system to study cytoadhesion of *Plasmodium falciparum* infected erythrocytes to primary brain microvascular endothelial cells. *Lab Chip*. 2011 Sep 7;11(17):2994-3000.

25. Francischetti IM, Oliveira CJ, Ostera GR, Yager SB, Debierre-Grockiego F, Carregaro V, Jaramillo-Gutierrez G, Hume JC, Jiang L, Moretz SE, Lin CK, Ribeiro JM, Long CA, Vickers BK, Schwarz RT, **Seydel KB**, Iacobelli M, Ackerman HC, Srinivasan P, Gomes RB, Wang X, Monteiro RQ, Kotsyfakis M, Sá-Nunes A, Waisberg M. Defibrotide interferes with several steps of the coagulation-inflammation cycle and exhibits therapeutic potential to treat severe malaria. *Arterioscler Thromb Vasc Biol*. 2012 Mar;32(3):786-98.

26. Phiri HT, Bridges DJ, Glover SJ, van Mourik JA, de Laat B, M'baya B, Taylor TE, **Seydel KB**, Molyneux ME, Faragher EB, Craig AG, Bunn JE. Elevated plasma von Willebrand factor and propeptide levels in Malawian children with malaria. *Infect Immun*. 2012 Mar;80(3):1150-5.

27. Milner DA Jr, Valim C, Luo R, Playforth KB, Kamiza S, Molyneux ME, **Seydel KB**, Taylor TE. Supraorbital postmortem brain sampling for definitive quantitative confirmation of cerebral sequestration of *Plasmodium falciparum* parasites. *J Infect Dis*. 2012 May 15;205(10):1601-6.

28. Milner DA Jr, Vareta J, Valim C, Montgomery J, Daniels RF, Volkman SK, Neafsey DE, Park DJ, Schaffner SF, Mahesh NC, Barnes KG, Rosen DM, Lukens AK, Van Tyne D, Wiegand RC, Sabeti PC, **Seydel KB**, Glover SJ, Kamiza S, Molyneux ME, Taylor TE, Wirth DF. Human cerebral malaria and *Plasmodium falciparum* genotypes in Malawi. *Malar J*. 2012 Feb 7;11:35.

29. Conroy AL, Glover SJ, Hawkes M, Erdman LK, **Seydel KB**, Taylor TE, Molyneux ME, Kain KC. Angiopoietin-2 levels are associated with retinopathy and predict mortality in Malawian children with cerebral malaria: a retrospective case-control study. *Crit Care Med*. 2012 Mar;40(3):952-9.

30. Potchen MJ, Kampondeni SD, **Seydel KB**, Birbeck GL, Hammond CA, Bradley WG, Demarco JK, Glover SJ, Ugorji JO, Latourette MT, Siebert JE, Molyneux ME, Taylor TE. Acute Brain MRI Findings in 120 Malawian Children with Cerebral Malaria: New Insights into an Ancient Disease. *Am J Neuroradiol*. 2012 Apr 19. [Epub ahead of print]

31. **Seydel KB**, Fox LL, Glover SJ, Reeves MJ, Pensulo P, Muiruri A, Mpakiza A, Molyneux ME, Taylor TE. Plasma Concentrations of Parasite Histidine-Rich Protein 2 Distinguish Between Retinopathy-Positive and Retinopathy-Negative Cerebral Malaria in Malawian Children. *J Infect Dis*. 2012 Jun 11. [Epub ahead of print]

Chapters and Reviews:

1. **Seydel, K.B.** and Stanley, S.L. Jr. 1996. SCID mice and the study of parasitic disease. *Clin. Micro. Rev*. 9:126-34.

2. **Seydel, K.B.** , Zhang, T. , and Stanley, S.L. Jr. 1997. Animal models of *E. histolytica* infection. Handbook of Animal Models of Infectious Diseases.

3. Francischetti IM, **Seydel KB**, Monteiro RQ. 2008. Blood coagulation, inflammation, and malaria. *Microcirculation* 15(2):81-107.

4. Milner DA Jr, Montgomery, J, Seydel, KB, and Rogerson SJ. Severe Malaria in children and pregnancy: an update and perspective. *Trends Parasitol*. 2008 Dec;24(12): 590-5.

5. Mu J, **Seydel KB**, Bates A, Su XZ. 2010. Recent progress in functional genomics research in *Plasmodium falciparum*. *Current genomics* 11:279-8.