

Date revised: 8/20/2013

**Name: Kelly A. Birdwell, MD, MSCI**

Office Address: Division of Nephrology and Hypertension  
S-3223 Medical Center North  
Vanderbilt University School of Medicine  
Nashville, TN 37232-2372

Office Phone Number: (615) 322-6976

Date and Place of Birth: December 19, 1973, Nashville, TN

**PERSONAL DATA:**

4233 Wallace Lane, Nashville, TN 37215

(615) 386-8353

Married to Eric Austin, MD, MSCI

2 daughters, Siena (4/24/2007) and Rowan (11/14/2009), 1 son, Reed (10/8/2012)

**Education:**

- University of Tennessee (Knoxville, TN), BA, May 1997 (College Scholars, *summa cum laude*)
- Emory University School of Medicine (Atlanta, GA), MD, May 2001, *cum laude*
- Vanderbilt University (Nashville, TN), MSCI, August 2008
- Intern and Resident, Department of Medicine, University of Colorado Health Sciences Center (Denver, CO), 2001-2004
- Postdoctoral Clinical Fellow, Division of Nephrology and Hypertension, Vanderbilt University Medical Center, (Nashville, TN), 2005-2008
- Postdoctoral Clinical Fellow, Kidney-Pancreas Transplant Center, Vanderbilt University Medical Center, (Nashville, TN), 2008-2009

**Licensure and Certification:**

- Tennessee: December 31, 2013, Kelly Ann Birdwell, #41173
- Colorado (inactive): Kelly Ann Birdwell, #42444
- American Board of Internal Medicine: #226623  
Internal Medicine, 2004  
Nephrology, 2007

**Academic Appointments:**

- Clinical Instructor, Department of Medicine, Vanderbilt University Medical Center, Nashville, TN, 07/2009- 06/2011
- Assistant Professor, Department of Medicine, Vanderbilt University Medical Center, Nashville, TN, 07/2011- Present

**Hospital Appointments**

- Staff Physician, Medical Center of Aurora, Aurora, CO, 2004-2005
- Staff Physician, Littleton Adventist Hospital, Denver, CO, 2004-2005
- Staff Physician, Porter Adventist Hospital, Denver, CO, 2004-2005
- Staff Physician, Sky Ridge Medical Center, Denver, CO, 2004-2005
- Staff Physician, SSCI Hospital, Aurora, CO, 2004-2005
- Staff Physician, Vanderbilt University Medical Center, 2009-Pres.

**Employment:**

- Hospitalist, Critical Care and Pulmonary Associates, Denver, CO, 2004-2005

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### **Professional Organizations:**

- Colorado Medical Society, 2001-2005
- American College of Physicians, 2002-Pres.
- American Society of Nephrology, 2006-Pres.
- National Kidney Foundation, 2006-Pres.
- Tennessee Medical Association, 2006-Pres.
- American Society of Transplantation (AST), 2009-Pres.
  - Member, AST Women's Health Community of Practice
  - Member, Trainee and Young Faculty Community of Practice
- Vanderbilt's Women on Tract, 2009-Pres.
- The Transplantation Society, 2011-Pres.
- American Society of Human Genetics, 2011-Pres.

### **Professional Activities:**

#### **• Intramural:**

Member, Medical School Curriculum Committee, Emory University School of Medicine, Atlanta, Georgia, 1997-1998

Chair, Health Outreach Program at Emory (HOPE), Winter Homeless Shelter Committee, Emory University School of Medicine, Atlanta, Georgia, 1997-1998

Founder and Chair, HOPE International Women's House Committee, Emory University School of Medicine, Atlanta, Georgia, 1998-1999

Member, Medical Student Selection Committee, Emory University School of Medicine, Atlanta, Georgia, 1999-2000

Member, Resident Teaching Awards Committee, Emory University School of Medicine, Atlanta, Georgia, 1999-2000

Member, Dean's Committee for Medical Education Building Planning, Emory University School of Medicine, Atlanta, Georgia, 2000-2001

Member, Emory *Alpha Omega Alpha* Education Committee, Emory University School of Medicine, Atlanta, Georgia, 2000-2001

Member, Residency Work Hours Committee, University of Colorado Health Sciences Center, Denver, CO, 2002-2003

Interviewer, Nephrology Fellowship, Vanderbilt University Medical Center, Nashville, TN, 2009-Pres.

Interviewer, Medical School Admissions, Vanderbilt School of Medicine, Nashville, TN, 2009-Pres.

Member, Kidney Transplant Recipient Selection Committee, Vanderbilt University Medical Center, Nashville, TN, 2009-Pres.

Member, Pharmacogenomic Resource for Enhanced Decisions In Care and Treatment (PREDICT) Committee, Vanderbilt University Medical Center, Nashville, TN, 2011-Pres.

Member, BioVU (DNA databank) Review Committee, Vanderbilt University Medical Center, Nashville, TN, 2012-Pres.

Advisor, Junior Faculty Research Committee, Division of Nephrology, Vanderbilt University Medical Center, Nashville, TN, 2012-Pres.

Interviewer, Transplant Pharmacy Residency, Vanderbilt University Medical Center, Nashville, TN, 2013-Pres.

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Provider Champion, Pharmacogenomic Resource for Enhanced Decisions In Care and Treatment (PREDICT) Hotline, Vanderbilt University Medical Center, Nashville, TN, 2013-Pres.

Mentor, Vanderbilt Student Research Training Program in Kidney Disease, Vanderbilt University Medical Center, Nashville, TN, 2013-Pres.

• **Extramural:**

Staff Physician, Parroco de Guadalupe Medical Clinic, Guadalupe, Ecuador, 2003

Member, Data Safety and Monitoring Board (DSMB), Safety, Tolerability and Efficacy of Coenzyme Q10 in Hemodialysis Patients, 2012- Pres.

Co-Chair, Abstract Review Committee Translational: Biomarkers, Immune Monitoring and Outcomes, American Transplant Congress, 2013

Member, American Society of Transplantation Kidney Pancreas Advisory Council, 2013- 2016

Member, American Society of Nephrology Education Committee, 2013-2016

Manuscript reviewer, *Clinical Nephrology*

Manuscript reviewer, *Journal of the American Society of Nephrology*

Manuscript reviewer, *Clinical Transplantation*

Manuscript reviewer, *Clinical Journal of the American Society of Nephrology*

Manuscript reviewer, *BMC Medical Genetics*

• **Special awards or recognition for professional activities:**

Alpha Omega Alpha, Emory University, 2000

Outstanding Instructor of Medical Students, University of Colorado Health Sciences Center, 2002

2<sup>nd</sup> Place Winner, Clinical Vignette Abstract and Poster, American College of Physicians, Colorado Associates Scientific Meeting, 2003

3<sup>rd</sup> Place Winner, Clinical Presentation, American College of Physicians, Colorado Associates Scientific Meeting, 2004

Vanderbilt Newman Society, 2009

Young Innovator Award, American Society of Transplantation, Annual Scientific Exchange, San Antonio, December 2011

Recipient, Travel Award for 2012 Translational Science Meeting in Washington, D.C., Vanderbilt Office of Clinical and Translational Science Development, April 2012

Recipient, Grant Award as Visiting Professor for "AMU: A unique graduate= possibilities. Improving the didactic potential of Adam Mickiewicz University through innovative education in English, interdisciplinary approach, e-learning, and investments in the staff." Adam Mickiewicz University, Poznan, Poland, May 2012

Recipient, "Best of Medical Informatics" article (The use of a DNA biobank linked to electronic medical records to characterize pharmacogenomic predictors of tacrolimus dose requirement in kidney transplant recipients *Pharmacogenet Genomics* 2012 Jan;22(1):32-42), *2012 International Medical Informatics Association (IMIA) Yearbook of Medical Informatics*, 2012

• **Invited Lectures:**

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1. University of Tennessee, Knoxville, Clifton M. Jones Leadership Conference. Keynote speaker. "UTK Leadership." Knoxville, TN, March 31, 2012
2. University of Tennessee, Knoxville, Clifton M. Jones Leadership Conference. "What's Past is Prologue: Building Leadership Skills for Now and the Future." Knoxville, TN, March 31, 2012
3. Adam Mickiewicz University, Master of Science in Biotechnology Visiting Lecturer. "Kidney: Normal Structure and Function." Poznan, Poland, May 21, 2012.
4. Adam Mickiewicz University, Master of Science in Biotechnology Visiting Lecturer. "Kidney Pathophysiology, Part I." Poznan, Poland, May 21, 2012.
5. Adam Mickiewicz University, Master of Science in Biotechnology Visiting Lecturer. "Kidney Pathophysiology, Part II." Poznan, Poland, May 21, 2012.
6. Adam Mickiewicz University, Master of Science in Biotechnology Visiting Lecturer. "Chronic Kidney Disease and Renal Replacement Therapy." Poznan, Poland, May 22, 2012.
7. Adam Mickiewicz University, Master of Science in Biotechnology Visiting Lecturer. "Transplant Immunology." Poznan, Poland, May 23, 2012.
8. Adam Mickiewicz University, Master of Science in Biotechnology Visiting Lecturer. "HLA Matching." Poznan, Poland, May 23, 2012.
9. Adam Mickiewicz University, Faculty of Biology Research Seminar. "Personalized Medicine: Pharmacogenomics of Tacrolimus in Kidney Transplantation." Poznan, Poland, May 23, 2012.
10. Adam Mickiewicz University, Master of Science in Biotechnology Visiting Lecturer. "Immunosuppressive Drugs in Kidney Transplantation." Poznan, Poland, May 24, 2012.
11. Adam Mickiewicz University, Master of Science in Biotechnology Visiting Lecturer. "Medical Complications of Kidney Transplantation." Poznan, Poland, May 24, 2012.
12. American Transplant Congress 2013. "Pharmacogenomics of Transplant Immunosuppression." Seattle, May 20, 2013.

### **Teaching Activities:**

#### **• Medical School Courses:**

1. Emory University School of Medicine, Problem-based Learning Course, Emory University School of Medicine, Atlanta, Georgia, 2000, Student Mentor
2. Emory University School of Medicine, Human Genetics Course, Atlanta, Georgia, 2001, Small Group Leader
3. Vanderbilt School of Medicine, Immunology Mini-Course, Nashville, TN, June 2008, Small Group Leader

#### **• Graduate School Courses:**

1. Vanderbilt University Medical Center, Biostatistics I Guest Lecturer. "Mann Whitney U and You." Nashville, TN, September 20, 2008, Lecturer
2. Vanderbilt University Medical Center, Grant Writing Course. "Writing a K." Nashville, TN, May 8, 2012, Lecturer
3. Vanderbilt University Medical Center, Grant Writing Course. "Writing a K." Nashville, TN, May 14, 2013, Lecturer

#### **• Continuing Medical Education:**

1. University of Colorado Health Sciences Center, Internal Medicine Clinical Conference. "Polymyositis." Denver, CO, January 2002, Lecturer

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2. University of Colorado Health Sciences Center, Internal Medicine Journal Club. "Continuous Venovenous Hemofiltration." Denver, CO, December 2003, Lecturer
3. American College of Physicians, Colorado Associates Scientific Meeting. "Double Trouble: Diplopia and Meningitis." Denver, CO, May 2003, Lecturer
4. American College of Physicians, Colorado Associates Scientific Meeting. "Methotrexate-Induced Hypokalemic Paralysis." Denver, CO, May 2004, Lecturer
5. Vanderbilt University Medical Center, Renal Transplant Clinical Conference. "Rapamycin and Malignancy." Nashville, TN, August 11, 2005, Lecturer
6. Vanderbilt University Medical Center, Nephrology Clinical Conference. "Mycophenolate for Lupus Nephritis." Nashville, TN, January 2, 2006, Lecturer
7. Vanderbilt University Medical Center, Renal Transplant Clinical Conference. "Influenza and Renal Transplant." Nashville, TN, February 10, 2006, Lecturer
8. Vanderbilt University Medical Center, Nephrology Renal Biopsy Conference. "Rheumatoid Arthritis, Disease Modifying Anti-Rheumatic Drugs, and Renal Failure." Nashville, TN, February 21, 2006, Lecturer
9. Vanderbilt University Medical Center, Nephrology Clinical Conference. "Acute Renal Failure in Multiple Myeloma." Nashville, TN, April 25, 2006, Lecturer
10. Vanderbilt University Medical Center, Nephrology Clinical Conference. "Treatment of IgA Nephropathy." Nashville, TN, July 31, 2006, Lecturer
11. Vanderbilt University Medical Center, M.S.C.I. Case Studies. "Influenza Vaccination and Infection and Renal Transplant Recipients." Nashville, TN, November 11, 2006, Lecturer
12. Elliot Newman Society M.S.C.I. & M.P.H. Program Annual Retreat. "Influenza Vaccine Response in Kidney Transplant Recipients." Nashville, TN. October 19, 2007, Lecturer
13. Vanderbilt University Medical Center, M.S.C.I. Case Studies. "Influenza Vaccine Response in Kidney Transplant Recipients." Nashville, TN, January 18, 2008, Lecturer
14. Vanderbilt University Medical Center, Molecular Medicine Conference. "Kidney Transplant Rejection Biomarkers." Nashville, TN, January 24, 2008, Lecturer
15. Vanderbilt University Medical Center, Nephrology Research Conference. "Influenza Vaccine Response in Kidney Transplant Recipients." Nashville, TN, March 25, 2008, Lecturer
16. Vanderbilt University Medical Center, Nephrology Journal Club Conference. "Mechanism of Contaminated Heparin Causing Adverse Events in Dialysis Patients." Nashville, TN, May 27, 2008, Lecturer
17. Vanderbilt University Medical Center, Biostatistics I Guest Lecturer. "Mann Whitney U and You." Nashville, TN, September 20, 2008, Lecturer
18. Vanderbilt University Medical Center, Housestaff Instruction. "Acute Rejection in Kidney Transplantation." Nashville, TN, November 5, 2008, Lecturer
19. Vanderbilt University Medical Center, Nephrology Renal Biopsy Conference. "Acute Kidney Injury in Kidney Transplantation." Nashville, TN, November 25, 2008, Lecturer
20. Vanderbilt University Medical Center, Renal Transplant Clinical Conference. "Gender Disparities in Kidney Transplantation." Nashville, TN, January 23, 2009, Lecturer

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21. Vanderbilt University Medical Center, Renal Grand Rounds. "Cardiovascular Disease in Kidney Transplantation: Modification of Risk Factors to Improve Long Term Patient Outcomes." Nashville, TN, February 5, 2009, Lecturer
22. Vanderbilt University Medical Center, Renal Grand Rounds. "Calcineurin Inhibitors in Kidney Transplantation: The Promise of Personalized Medicine." Nashville, TN, September 17, 2009, Lecturer
23. Vanderbilt University Medical Center, Renal Research Conference. "Pharmacogenomics of Tacrolimus in Kidney Transplantation." Nashville, TN, February 18, 2011, Lecturer
24. Vanderbilt University Medical Center, Infectious Diseases Grand Rounds. "Pharmacogenomics of Tacrolimus in Kidney Transplantation." Nashville, TN, April 6, 2011, Lecturer
25. Vanderbilt University Medical Center, Clinical Conference. "Induction, Maintenance, and Rejection Therapies in Kidney Transplantation." Nashville, TN, June 3, 2011, Lecturer
26. Vanderbilt University Medical Center, 10<sup>th</sup> Annual Clinical Research Retreat at the Frist. "Pharmacogenomics of Tacrolimus in Kidney Transplantation." Nashville, TN, October 28, 2011, Plenary Lecturer
27. Vanderbilt University Medical Center, Renal Grand Rounds. "New Onset Diabetes After Transplantation: Its Implication and Role of Genetics." Nashville, TN, November 3, 2011, Lecturer.
28. Vanderbilt University Medical Center, Renal Research Conference. "The Adipokine Resistin is Elevated in Kidney Transplant Recipients." Nashville, TN, December 8, 2011, Lecturer
29. Vanderbilt University Medical Center, Medical Grand Rounds. "Beyond Rejection: Noninfectious Complications of Kidney Transplantation." Nashville, TN, August 23, 2012, Lecturer.
30. Vanderbilt University Medical Center, Renal Grand Rounds. "Obesity in Kidney Transplant and the Role of Bariatric Surgery." Nashville, TN, October 4, 2012, Lecturer.
31. Vanderbilt University Medical Center, Clinical Conference. "Induction, Maintenance, and Rejection Therapies in Kidney Transplantation." Nashville, TN, June 21, 2013, Lecturer.

#### **Clinical Teaching:**

Teach medical students, residents, and fellows on inpatient rotations and in clinic (held once a week)

#### **Research Supervision:**

Gayle Vranic, MD, 2010-2011, Fellow  
M. Lee Sanders, MD, 2012-Pres., Fellow  
Gilad Jaffe, 2013, Medical Student

#### **Research Program:**

##### **National Institutes of Health, NIGMS, 1 K23 GM100183-01**

9/1/2011- 8/31/2016

PI: Birdwell, Kelly

Mentor: Ikizler, Alp and Roden, Dan

Pharmacogenomics of Tacrolimus and New Onset Diabetes After Kidney Transplant

Role: PI

##### **Vanderbilt University CTSA grant 1 UL1 RR024975 from NCRR/NIH**

02/8/2013 – 02/7/2016

Vanderbilt Institute for Clinical and Translational Research (VICTR)

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PI: Birdwell, Kelly

Finding Longitudinal Indicators of Cardiovascular Risk in Kidney Transplant Recipients

Role: Primary Investigator

This award pays for Clinical Research Center use, selected clinical lab testing, vascular ultrasounds, and DEXA scans.

**National Institutes of Health, NIDDK, Loan Repayment Program**

7/1/2013- 6/30/2014

PI: Birdwell, Kelly

Mentor: Ikizler, Alp

Pharmacogenomics of Tacrolimus and New Onset Diabetes in Kidney Transplant

Role: PI and Physician Scientist

**National Institutes of Health, NIDDK, Loan Repayment Program**

7/1/2011- 6/30/2013

PI: Birdwell, Kelly

Mentor: Ikizler, Alp

The impact of a reduced calorie diet intervention in kidney transplant recipients on body composition, oxidative stress, and insulin resistance

Role: PI and Physician Scientist

**Vanderbilt University CTSA grant 1 UL1 RR024975 from NCRR/NIH**

05/13/2010 – 05/12/2013

Vanderbilt Institute for Clinical and Translational Research (VICTR)

PI: Birdwell, Kelly

Reduced Calorie Diet Intervention in Kidney Transplant Recipients

Role: Primary Investigator

This award pays for Clinical Research Center use, selected clinical lab testing, metabolic cart, DEXA scans, bioelectrical impedance testing, and physical activity monitoring.

**Vanderbilt University CTSA grant 1 UL1 RR024975 from NCRR/NIH**

04/26/2010 – 04/25/2011

Vanderbilt Institute for Clinical and Translational Research (VICTR)

PI: Haas, David

Pharmacogenomics of Solid Organ Transplantation

Role: Co-Investigator

This award pays for custom genotyping of selected ADME genes using Sequenom.

**Vanderbilt Physician Scientist Development Program (VPSD)**

07/01/2009 – 06/30/2011

PI: Brown, Nancy Assoc. Dean for Clinical and Translational Scientist Development

Mentor: Ikizler, Alp

Reduced Calorie Diet Intervention in Kidney Transplant Recipients

Role: Scholar and Physician Scientist

This award provides salary support plus funds to mentor's lab to conduct clinical research.

**Vanderbilt University CTSA grant 1 UL1 RR024975 from NCRR/NIH**

03/06/2009 – 03/05/2011

Vanderbilt Institute for Clinical and Translational Research (VICTR)

PI: Haas, David

Pharmacogenomics of Solid Organ Transplantation

Role: Co-Investigator

This award pays for 600 Affymetrix DMET Plus chips to be used for genotyping.

**NRSA T32 Training Grant (5 T32 DK007569-17)**

07/01/2006 – 06/30/2008

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PI: Birdwell, Kelly A

Mentor: Wright, Peter F

Influenza Vaccination and Infection in Kidney Transplant Recipients

Role: PI

**K30 Clinical Research Curriculum Award (5 K30 RR022298-08)**

07/01/2006 – 06/30/2008

Provided tuition support for Master of Science in Clinical Investigation Program.

**NIH GCRC M01 RR00095**

09/27/2006 – 06/30/2008

Vanderbilt General Clinical Research Center

PI: Birdwell, Kelly A

Mentor: Wright, Peter F

Influenza Vaccination and Infection in Kidney Transplant Recipients



## Publications and Presentations:

### · Articles in refereed journals

1. **Birdwell KA**, Ikizler MR, Sannella EC, Wang L, Byrne DW, Ikizler TA, Wright PF. Decreased antibody response to influenza vaccination in kidney transplant recipients: a prospective cohort study. *Am J Kidney Dis* 54 (1):112-21, 2009. PMID: 19185404
2. Xu H, Doan S, **Birdwell KA**, Cowan JD, Vincz AJ, Haas DW, Basford MA, Denny JC. An automated approach to calculating the daily dose of tacrolimus in electronic health records. *AMIA Summits on Transl Sci Proc* 1:71-5, 2010. PMID: 21347153
3. **Birdwell KA**, Grady B, Choi L, Xu H, Bian A, Denny JC, Jiang M, Vranic G, Basford M, Cowan JD, Richardson DM, Robinson MP, Ikizler TA, Ritchie MD, Stein CM, Haas DW. Use of a DNA biobank linked to electronic medical records to characterize pharmacogenomics predictors of tacrolimus dose requirement in kidney transplant recipients. *Pharmacogenet Genomics* 22: 32-42, 2012. PMID:22108237
4. **Birdwell KA**, Ikizler MR, Sannella EC, Wang L, Byrne DW, Wright PF, Ikizler TA. Seasonal Maintenance of Influenza Vaccine-Induced Antibody Response in Kidney Transplant Recipients. *Am J Nephrol* 36:201-207, 2012. PMID: 22906930

### · Abstracts

1. **Birdwell KA** and Del Rio C. Improved Outpatient Care and Outcomes Among HIV-Infected Patients Through a Discharge Intervention. Southern Association for Medical Research Meeting, February 1999.
2. **Birdwell KA**. Double Trouble: Diplopia and Meningitis. American College of Physicians, Colorado Associates Scientific Meeting, May 2003.
3. **Birdwell KA**. Methotrexate-Induced Hypokalemic Paralysis. American College of Physicians, Colorado Associates Scientific Meeting, May 2004.
4. **Birdwell KA**, Sannella EC, Ikizler MR, Ikizler TA, Wright PF. Influenza Vaccine Response in Kidney Transplant Recipients. *J. Am. Soc. Nephrol.* Renal Week Abstracts (18), 2007.
5. **Birdwell KA**, Sannella EC, Ikizler MR, Ikizler TA, Wright PF. Influenza Vaccine Response in Kidney Transplant Recipients. 26<sup>th</sup> Annual Research Forum, Graduate Medical Education, Vanderbilt University School of Medicine, April 2008.
6. **Birdwell KA**, Ikizler MR, Ikizler TA, Wright PF. Kidney Transplant Subjects Maintain Protective Titer to Influenza Vaccine. *J. Am. Soc Nephrol.* Renal Week Abstracts (19), 2008.
7. **Birdwell KA**, Ikizler MR, Ikizler TA, Wright PF. Kidney Transplant Subjects Maintain Protective Titer to Influenza Vaccine. 27<sup>th</sup> Annual Research Forum, Graduate Medical Education, Vanderbilt University School of Medicine, April 2009.
8. **Birdwell KA**, Grady B, Choi L, Xu H, Denny JC, Jiang M, Ritchie MD, Vranic G, Cowan JD, Basford MA, Stein CM, Ikizler TA, and Haas DW. Use of a Novel Genomics/Informatics Resource To Identify Predictors of Tacrolimus Blood Concentrations in Kidney Transplant Recipients. *Am J Transplant* 11 (Suppl 2): 273, 2011.
9. **Birdwell KA**, Laderbush B, Booker C, Ikizler TA. The adipokine resistin is associated with time post transplant in kidney transplant recipients. American Society of Transplantation Annual Scientific Exchange, San Antonio, December 2011.
10. **Birdwell KA**, Graves AJ, Laderbush BF, Shintani A, Ikizler TA. ADMA levels post kidney transplant. Association of Clinical Research Training, American Federation for Medical Research, Society of Clinical and Translational Science, Translational Science 2013, Washington DC, April 2013.

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11. Jaffe GM, Bian A, Pouliot BF, Shintani A, Ikizler TA, **Birdwell KA**. An investigation of arterial stiffness as a cardiovascular risk factor in kidney transplant recipients. NIDDK Medical Student Research Program Symposium, Nashville, TN, July 2013.

• **Oral Presentations**

1. **Birdwell KA**, Laderbush B, Booker C, Ikizler TA. The adipokine resistin is elevated in kidney transplant recipients. American Society of Transplantation Annual Scientific Exchange, San Antonio, December 2011.