

BIOSKETCH

Gloria C. Higgins, PhD, MD

Professor Emeritus, Pediatrics, The Ohio State University College of Medicine

EDUCATION AND TRAINING (date completed)

BS Biology 1970, Fairmont State College, Fairmont, WV

PhD Biochemistry 1976, West Virginia University, Morgantown, WV

Post-doctoral Fellowship 1978 - Sloan-Kettering Inst. for Cancer Research, Rye, NY.

MD 1983 - Albert Einstein College of Medicine, Bronx, NY

Residency in Pediatrics 1986 - Children's National Medical Center, Wash., DC

Rheumatology Fellowship 1989 - University of Tennessee, Memphis, TN

POSITIONS AND EMPLOYMENT

1978-83 Associate Researcher, Sloan-Kettering Institute for Cancer Research, NY

1986-87 Guest Researcher, National Institutes of Health, Bethesda, MD

1989-91 Instructor in Pediatrics, University of Tennessee, Memphis, TN

1989-99 Medical Staff, LeBonheur Children's Medical Center, Memphis, TN

1991-94 Asst. Prof. of Pediatrics (non-tenure track), Univ. of Tennessee, Memphis, TN

1995-98 Asst. Prof. of Pediatrics (tenure track), University of Tennessee, Memphis, TN

1998-99 Associate Professor of Pediatrics, University of Tennessee, Memphis, TN

1999-2010 Associate Professor of Pediatrics, The Ohio State University, Columbus, OH

2011-15 Professor of Clinical Pediatrics, The Ohio State University, Columbus, OH

1999-2015 Medical Staff, Rheumatology, Nationwide Children's Hosp, Columbus, OH

2015- Professor Emeritus, Pediatrics, The Ohio State University, Columbus, OH

BOARD CERTIFICATION

1987 Pediatrics, American Board of Pediatrics (not time-limited)

1992, 1999, 2006, 2014 Pediatric Rheumatology, American Board of Pediatrics

OTHER EXPERIENCE and PROFESSIONAL MEMBERSHIPS

1978- Sigma Xi Scientific Research Society

1983- Fellow, American Academy of Pediatrics;

1992- Member Rheumatology Section, American Academy of Pediatrics

1992-95 Ethics Committee, LeBonheur Hospital, Memphis, TN

1994-99 Research Committee (sub-IRB), LeBonheur Hospital, Memphis, TN

1992- Fellow, American College of Rheumatology; Member, Pediatrics Section

2003-06 ACR Pediatrics Section Executive Committee

2008-11 ACR Ethics Committee

1998-2007 Pediatric Rheumatology Disease Registry, Steering Committee

2001-2012 Arthritis Foundation Central Ohio Chapter

Executive Board and Advocacy Committee

2002-2013	American Board of Pediatrics, MOC-G /Gen Peds Exam Committee
2002-	Pediatric Rheumatology Research Network (PRN) /Childhood Arthritis and Rheumatology Research Alliance (CARRA) - charter member
2004-2011	Vice-chair, CARRA Scleroderma, Vasculitis, Rare Dis. Research Committee
2007-	Member, CARRA Localized Scleroderma work-group
2009-2013	Pediatric Rheumatology Collaborative Study Group (PRCSG) Advisory Council

HONORS

1966-70	West Virginia Board of Regents Scholarship, BS Summa cum Laude (1970)
1972-76	West Virginia University Foundation Fellowship
1978-79	NIH Postdoctoral Fellowship
1980-83	American Cancer Society Special Postdoctoral Fellowship
1982 -	Alpha Omega Alpha
1989-92	Arthritis Foundation Postdoctoral Fellowship
1990	Burroughs Wellcome Young Investigator Award, Southern Soc. Clinical Inv.
1990	Rheumatology Senior Scholar Award, American College of Rheumatology
1992	Bea Gerber Award, LeBonheur Club, LeBonheur Children's Medical Center
2002, 2011	ACR Visiting Professor in Pediatric Rheumatology
2007	AAP Visiting Professor in Pediatric Rheumatology
2015	American College of Rheumatology Master Designation
2015	American Academy of Pediatrics Cassidy Award

SELECTED PEER-REVIEWED PUBLICATIONS (as a named author)

1. Higgins GC, Foster JL, Postlethwaite AE. 1994. Interleukin-1 β propeptide is detected intracellularly and extracellularly when human monocytes are stimulated with LPS in vitro. *J Exp Med.* 180: 607-614.
2. Higgins GC, Postlethwaite AE. 1996. Synovial fluids from rheumatoid arthritis patients contain a unique inhibitor of IL-1 α *J Rheumatol* 23: 965-973.
3. Foster JL, Higgins GC, Jackson FR. 1996. Biochemical properties and tissue distribution of the Drosophila DG1 cGMP-dependent protein kinase. *J Biol Chem* 271:23322-23328.
4. Lew DB, Higgins GC, Skinner RB, Snider MD, Myers LK. 1999. Adverse reaction to prednisone in a patient with systemic lupus erythematosus. *Ped. Dermatol* 16:146-150.
5. Higgins GC, Wu Y, Postlethwaite AE. 1999. Intracellular IL-1 receptor antagonist is elevated in human dermal fibroblasts that overexpress intracellular precursor IL-1 \cdot . *J Immunol* 163:3969-3975.
6. Myers LK, Thompson JW, Walton C, Hendricks J, Kerr N., Pandya R., Seyer JD, Postlethwaite AE, Kang AH, Higgins GC. 2001. Juvenile Arthritis and Autoimmunity to Type II Collagen. *Arthritis Rheumatol* 44: 1775-1781.
7. Brunner HL, Kim KN, Ballinger SH, Bowyer SL, Griffin TA, Higgins GC, Mier R, Passo MH, Rennebohm R, Schikler K, Lovell DJ. 2001. Current Medication Choices in Juvenile Rheumatoid Arthritis II – Update of a Survey Performed in 1993. *J Clin Rheumatol* 7:295-300.
8. Artlett CM et al for the Childhood Myositis Heterogeneity Collaborative Study Group. 2001. Persistent maternally derived peripheral microchimerism is associated with the juvenile idiopathic inflammatory myopathies. *Rheumatology* 40:1279-1284.
9. Navarro MJ, Higgins GC, Lohr K, Myers LK. 2002. Amelioration of Relapsing

Polychondritis in a Child Treated with Oral Collagen. *Am J Med Sci* 324:101-103.

10. Chung EK, Yang Y, Rennebohm RM, Lokki M-L, Higgins GC, Jones KN, Zhou B, Blanchong CA, Yu CY. 2002. Genetic sophistication of human complement components C4A and C4B and RP-C4-CYP21-TNX (RCCX) modules in the major histocompatibility complex. *Am J Hum Genet* 71:823-837.

11. Bowyer SL, Roettcher PA, Higgins GC, Adams B, Myers LK, Wallace C, Rennebohm R, et al. 2003. Health status of patients with juvenile rheumatoid arthritis (JRA) at 1 and 5 years after diagnosis. *J Rheumatol* 30:394-400.

12. Mahdavian S, Higgins GC, Kerr NC. 2005. Orbital Pseudotumor in a Child with Juvenile Rheumatoid Arthritis. *J Pediatr Ophthalmol Strabismus* 42: 185-188.

13. Kimura Y, Pinho P, Walco G, Higgins G, et al. 2005. Etanercept Treatment in Patients with Refractory Systemic Onset Juvenile Rheumatoid Arthritis. *J. Rheumatol* 32:935-42.

14. Fall Ndate, Bove KE, Stringer K, Lovell DJ, Brunner HI, Weiss J, Higgins GC, Bowyer SL, Graham TB, Thornton S, Grom AA. Association Between Lack of Angiogenic Response in Muscle Tissue and High Expression of Angiostatic ELR-Negative CXC Chemokines in Patients with Juvenile Dermatomyositis. Possible Link to Vasculopathy. *Arthritis Rheum* 52: 3175-80, 2005.

15. Zulain F, Athreya BH, Laxer R, Nelson AM, Feitosa de Oliveira SK, Punaro MG, Cuttica R, Higgins GC, et al. Juvenile localized scleroderma: clinical and epidemiological features in 750 children. An international study. *Rheumatology*, 45:614-620, 2006.

16. Lovell DJ, Glass D, Ranz J, Dramer S, Hunag B, Sierra RI, Henderson CJ, Passo M, Graham B, Bowyer S, Higgins G, Rennebohm R, Schikler KN, Giannini E. A randomized controlled trial of calcium supplementation to increase bone mineral density in children with juvenile rheumatoid arthritis. *Arthritis Rheum* 54:2235-2243, 2006.

17. Kanangat S, Postlethwaite A, Higgins GC, Hasty KA. Novel Functions of Intracellular IL-1ra in Human Dermal Fibroblasts: Implications in the Pathogenesis of Fibrosis. *J Invest Derm* 126:756-765, 2006.

18. Wu YL, Higgins GC, Rennebohm RM, Chung EK, Yang Y, Zhou B, Nagaraja N, Birmingham DJ, Rovin BH, Hebert LA, Yu CY. Three distinct profiles of serum complement C4 proteins in pediatric lupus erythematosus (SLE) Patients: Tight associations of complement C4 and C4 protein levels in SLE but not healthy subjects. *Adv Exp Med Biol* 586:227-247, 2006..

19. Zannin ME, Martin G, Athreya BH, Russo R, Higgins GC, Vittadello F, Alpigliani MG, Alessio M, Paradisi M, Woo P, Zulian F. Ocular involvement in children with localized scleroderma: a multicenter study. *Br J Ophthalmol* 91:1311-1314, 2007

20. Yang Y, Chung EK, Wu YL, Savelli SL, Nagaraja HN, Zhou B, Hebert M, Jones KN, Shu Y, Kitzmiller K, Blanchong CA, McBride KL, Higgins GC, Rennebohm RM, Rice RR, Hackshaw KV, Roubey RA, Grossman JM, Tsau BP, Birmingham DJ, Rovin BH, Hebert LA, Yu CY. Gene copy-number variation and associated polymorphisms of complement component C4 in human systemic lupus erythematosus (SLE): Low copy number is risk factor for and high copy number is a protective factor against SLE susceptibility in European Americans. *Am J Hum Genet* 80:1037-54, 2007.

21. Koneru S, Shishov M, Ware A, Farhey Y, Mongey AB, Graham TB, Passo MH, Houk JL, Higgins GC, Brunner HI. Effectively measuring adherence to medications for systemic lupus erythematosus in a clinical setting. *Arthritis Rheum* 57:1000-6, 2007.

22. Zannin ME, Martini G, Athreya BH, Uuso R, Higgins G, Vittadello F, Alpigliani MG, Alessio M, Paradisi M, Woo P, Zulien F. 2007. Ocular involvement in children with localized scleroderma: a multi-centre study. *Br J Ophthalmol* 91:1311-1314.

- 23.** Koneru S, Kocharila L, Higgins GC, Ware A, Passo MH, Farhey YD, Mongey AB, Graham TB, Houk JL, Brunner HI. 2008. Adherence to medications in systemic lupus erythematosus. *J Clin Rheumatol* 14:195-201.
- 24.** Schanberg LE, Sandborg C, Barnhart HX, Ardoin SP, Yow E, Evans GW, Mieszkalski KL, Ilowite NT, Eberhard A, Levy DM, Kimura Y, von Scheven E, Silverman E, Bowyer SL, Punaro L, Singer NG, Sherry DD, McCurdy D, Klein-Gitelman M, Wallace C, Silver R, Wagner-Weiner L, Higgins GC, Brunner HI, Jung L, Soep JB, Reed A, 2009. Premature atherosclerosis in pediatric systemic lupus erythematosus: Risk factors for increased carotid intima-media thickness in the atherosclerosis prevention in pediatric lupus erythematosus cohort. *Arthritis Rheum* 50:1496-1507.
- 25.** Brunner H, Higgins G, Wiers K, Lapidus S, Olson J, Onel K, Punaro M, Ying J, Klein-Gitelman M, Seid M. 2009. Health-related Quality of Life and its Relationship to Patient Disease Course in Childhood-onset Systemic Lupus Erythematosus. *J Rheumatol*, 36:1536-1545.
- 26.** Giannini E, Ilowite NT, Lovell DJ, Wallace CA, Rabinovich CE, Reiff A, Higgins G, Gottlieb B, Singer NG for the Pediatric Rheumatology Collaborative Study Group; Chon Y, Lin S-L, Baumgartner SW. 2009. Long-Term Safety and Effectiveness of Etanercept in Children With Selected Categories of Juvenile Idiopathic Arthritis. *Arthritis Rheum* 60:2794-2804.
- 27.** Arkachaisri T, Vilaiyuk S, Li S, O'Neil KO, Pope E, Higgins GC, Punaro M, Rabinovich EC, Rosenkranz M, Keitz DA, Rosen P, Spaulding SJ, Hennon TR, Torok KS, Cassidy E, Medsger TA. 2009. The localized scleroderma skin severity index (LoSSI) and physician global assessment of disease activity: a work-in-progress toward the development of localized scleroderma outcome measures. *J Rheumatol* 36:2819-2829.
- 28.** Cabral DA, Uribe A, Benseler S, O'Neil KM, Hashkes PH, Higgins G, Zeff A, Lovell DJ, Kingsbury D, Stevens A, McCurdy D, Chira P, Abramson L, Arkachaisri T, Campillo S, Eberhard A, Hersh A, Huber AM, Kim S, Klein-Gitelman M, Levy D, Li SC, Mason T, De Witt EM, Muscal E, Nassi L, Reiff A, Schikler K, Singer NG, Wahezi D, Woodward A, 2009. Presentation, classification, and initial treatment of Wegener's granulomatosis in childhood: An ARChiVe Project. *Arthritis Rheum* 60:3414-3424
- 29.** Canna S, Frankovich J, Higgins G, Narkweicz M, Nash R, Hollister R, Soep J, Dragone L. 2009. Acute hepatitis in three patients with systemic juvenile idiopathic arthritis (sJIA) taking interleukin-1 receptor antagonist (IL1RA) *Pediatric Rheumatology* 7:21 (published on-line 12/22/09).
- 30.** Brunner H, Higgins GC, Wiers K, Lapidus SK, Olson JC, Onel K, Punaro M, Ying J, Klein-Gitelman MS, Giannini EH. 2010. Prospective Validation of the Provisional Criteria for the Evaluation of Response to Therapy in Childhood-onset Systemic Lupus Erythematosus (cSLE). *Arthritis Care and Research* 62:335-344.
- 31.** Arkachaisri T, Vilaiyuk S, Li S, O'Neil KO, Pope E, Higgins GC, Punaro M, Rabinovich EC, Rosenkranz M, Keitz DA, Rosen P, Spaulding SJ, Hennon TR, Torok KS, Cassidy E, Medsger TA. 2009. The localized scleroderma skin severity index (LoSSI) and physician global assessment of disease activity: a work-in-progress toward the development of localized scleroderma outcome measures. *J Rheumatol* 36:2819-2829.
- 32.** Li SC, Feldman BM, Higgins GC, Haines KA, Punaro MG, O'Neil KM. 2009. Treatment of Pediatric Localized Scleroderma: Results of a Survey of North American Pediatric Rheumatologists. *J Rheumatol* 37:175-181.
- 33.** Brunner H, Klein-Gitelman M, Higgins G, Lapidus S, Levy D, Eberhard A, Singer N, Olson J, Onel K, Schanberg L, von Scheven E, Ying Y, Giannini E. 2010. Towards the Development of Criteria for Global Flares in Juvenile Systemic Lupus Erythematosus, *Arthritis Care and*

Research 62:811-820.

- 34.** Brunner HI, Higgins GC, Klein-Gitelman MS, Lapidus SK, Olson JC, Onel K, Punaro M, Ying J, Giannini EH. 2010. Minimal clinically important differences of disease activity indices in childhood-onset systemic lupus erythematosus. *Arthritis Rheum* 62:950-959.
- 35.** Giannini EH, Ilowite NT, Lovell DJ, Wallace CA, Rabinovich CE, Reiff A, Higgins G, Gottlieb B for the Pediatric Rheumatology Collaborative Study Group; Chon Y, Baumgartner SW. 2010. Effects of Long-term Etanercept on Growth in Children with Selected Categories of Juvenile Idiopathic Arthritis. *Arthritis Rheum* 60:3259-3264.
- 36.** Ardoin SP, Schanberg LE, Sandborg C, Yow E, Barnhart HX, Mieszkalski K, Ilowite NT, von Scheven E, Eberhard A, Levy DM, Kimura Y, Silverman E, Bowyer SL, Punaro L, Singer NG, Sherry DD, McCurdy D, Klein-Gitelman M, Wallace C, Silver R, Wagner-Weiner L, Higgins GC, Brunner HI, Jung LK, Imundo L, Soep JB, Reed AM; APPLE investigators. 2010. Laboratory markers of cardiovascular risk in pediatric SLE: the APPLE baseline cohort. *Lupus* 19: 1315-1325.
- 37.** Nigrovic PA, Mannion M, Prince FH, Zeff A, Rabinovich CE, van Rossum MA, Cortis E, Pardeo M, Miettunen PM, Janow G, Birmingham J, Eggebeen A, Janssen E, Shulman AI, Son MB, Hong S, Jones K, Ilowite NT, Cron RQ, Higgins GC. 2010. Anakinra as first-line disease-modifying therapy in systemic juvenile idiopathic arthritis: report of forty-six patients from an international multicenter series. *Arthritis Rheum* 63:545-555.
- 38.** Brunner HI, Mina R, Pilkington C, Beresford MW, Reiff A, Levy DM, Tucker LB, Eberhard BA, Ravelli A, Schanberg LE, Saad-Magalhaes C, Higgins GC, Onel K, Singer NG, von Scheven E, Itert L, Klein-Gitelman MS, Punaro M, Ying J, Giannini EH. 2011. Preliminary criteria for global flares in childhood-onset systemic lupus erythematosus. *Arthritis Care Res* 63:1213-23.
- 39.** Schanberg LE, Sandborg C, Barnhart HX, Ardoin SP, Yow E, Evans GW, Mieszkalski KL, Ilowite NT, Eberhard A, Imundo LF, Kimura Y, von Scheven E, Silverman E, Bowyer SL, Punaro M, Singer NG, Sherry DD, McCurdy D, Klein-Gitelman M, Wallace C, Silver R, Wagner-Weiner L, Higgins GC, Brunner HI, Jung L, Soep JB, Reed AM, Provenzale J, Thompson SD. 2012. Atherosclerosis Prevention in Pediatric Lupus Erythematosus Investigators. Use of atorvastatin in systemic lupus erythematosus in children and adolescents. *Arthritis Rheum* 64:285-96.
- 40.** Wallace CA, Giannini EH, Spalding SJ, Hashkes PJ, O'Neil KM, Zeff AS, Szer IS, Ringold S, Brunner HI, Schanberg LE, Sundel RP, Milojevic D, Punaro MG, Chira P, Gottlieb BS, Higgins GC, Ilowite NT, Kimura Y, Hamilton S, Johnson A, Huang B, Lovell DJ; for the Childhood Arthritis Rheumatology Research Alliance (CARRA). 2012. Trial of early aggressive therapy in polyarticular juvenile idiopathic arthritis. *Arthritis Rheum* 64:2012-21.
- 41.** Mina R, Klein-Gitelman MS, Ravelli A, Beresford MW, Avcin T, Espada G, Anne Eberhard B, Schanberg LE, O'Neil KM, Silva CA, Higgins GC, Onel K, Singer NG, von Scheven E, Imundo LF, Nelson S, Giannini EH, Brunner HI. 2012. Inactive disease and remission in childhood-onset systemic lupus erythematosus. *Arthritis Care Res* 64:683-9349.
- 42.** Morishita K, Li SC, Muscal E, Spalding S, Guzman J, Uribe A, Abramson L, Baszis K, Benseler S, Bowyer S, Campillo S, Chira P, Hersh AO, Higgins G, Eberhard A, Ede K, Imundo L, Jung L, Kim S, Kingsbury DJ, Klein-Gitelman M, Lawson EF, Lovell DJ, Mason T, McCurdy D, Nanda K, Nassi L, O'Neil KM, Rabinovich E, Ramsey SE, Reiff A, Rosenkranz M, Schikler K, Stevens A, Wahezi D, Cabral DA; for the ARChiVe Investigators Network. 2012. Assessing the Performance of the Birmingham Vasculitis Activity Score at Diagnosis for Children with Antineutrophil Cytoplasmic Antibody-associated Vasculitis in A Registry for Childhood Vasculitis (ARChiVe). *J Rheumatol* 39:1088-1094.

- 43.** Morishita K, Guzman J, Chira P, Muscal E, Zeft A, Klein-Gitelman M, Uribe AG, Abramson L, Benseler SM, Eberhard A, Ede K, Hashkes PJ, Hersh AO, Higgins G, Imundo LF, Jung L, Kim S, Kingsbury DJ, Lawson EF, Lee T, Li SC, Lovell DJ, Mason T, McCurdy D, O'Neil KM, Punaro M, Ramsey SE, Reiff A, Rosenkranz M, Schikler KN, Scuccimarri R, Singer NG, Stevens AM, van Mater H, Wahezi DM, White AJ, Cabral DA; ARChiVe Investigators Network. 2012. Do adult disease severity subclassifications predict use of cyclophosphamide in children with ANCA-associated vasculitis? An analysis of ARChiVe study treatment decisions. *J Rheumatol* 39:2012-20.
- 44.** Uribe AG, Huber AM, Kim S, O'Neil KM, Wahezi DM, Abramson L, Baszis K, Benseler SM, Bowyer SL, Campillo S, Chira P, Hersh AO, Higgins GC, Eberhard A, Ede K, Imundo LF, Jung L, Kingsbury DJ, Klein-Gitelman M, Lawson EF, Li SC, Lovell DJ, Mason T, McCurdy D, Muscal E, Nassi L, Rabinovich E, Reiff A, Rosenkranz M, Schikler KN, Singer NG, Spalding S, Stevens AM, Cabral DA; ARegistry for Children with Vasculitis e-entry (ARChiVe) Network. 2012. Increased sensitivity of the European medicines agency algorithm for classification of childhood granulomatosis with polyangiitis. *J Rheumatol* 39:1687-97.
- 45.** Li SC, Torok KS, Pope E, Dedeoglu F, Hong S, Jacobe HT, Rabinovich CE, Laxer RM, Higgins GC, Ferguson PJ, Lasky A, Baszis K, Becker M, Campillo S, Cartwright V, Cidon M, Inman CJ, Jerath R, O'Neil KM, Vora S, Zeft A, Wallace CA, Ilowite NT, Fuhlbrigge RC; Childhood Arthritis and Rheumatology Research Alliance (CARRA) Localized Scleroderma Workgroup. 2012. Development of consensus treatment plans for juvenile localized scleroderma: a roadmap toward comparative effectiveness studies in juvenile localized scleroderma. *Arthritis Care Res* 64:1175-85.
- 46.** Young CM, Shiels WE 2nd, Coley BD, Hogan MJ, Murakami JW, Jones K, Higgins GC, Rennebohm RM. 2012. Ultrasound-guided corticosteroid injection therapy for juvenile idiopathic arthritis: 12-year care experience. *Pediatr Radiol* 42:1481-9.
- 47.** Mina R, Klein-Gitelman MS, Nelson S, Eberhard BA, Higgins G, Singer NG, Onel K, Tucker L, O'Neil KM, Punaro M, Levy DM, Haines K, Martini A, Ruperto N, Lovell D, Brunner HI. 2014. Validation of the systemic lupus erythematosus responder index for use in juvenile-onset systemic lupus erythematosus. *Ann Rheum Dis* 73:401-6.
- 48.** Ardoin SP, Schanberg LE, Sandborg CI, Barnhart HX, Evans GW, Yow E, Mieszkalski KL, Ilowite NT, Eberhard A, Imundo LF, Kimura Y, Levy D, von Scheven E, Silverman E, Bowyer SL, Punaro L, Singer NG, Sherry DD, McCurdy DK, Klein-Gitelman M, Wallace C, Silver RM, Wagner-Weiner L, Higgins GC, Brunner HI, Jung L, Soep JB, Reed AM, Thompson SD; APPLE investigators. 2014. Secondary analysis of APPLE study suggests atorvastatin may reduce atherosclerosis progression in pubertal lupus patients with higher C reactive protein. *Ann Rheum Dis* 73:557-66.
- 49.** Wallace CA, Giannini EH, Spalding SJ, Hashkes PJ, O'Neil KM, Zeft AS, Szer IS, Ringold S, Brunner HI, Schanberg LE, Sundel RP, Milojevic DS, Punaro MG, Chira P, Gottlieb BS, Higgins GC, Ilowite NT, Kimura Y, Johnson A, Huang B, Lovell DJ; Childhood Arthritis and Rheumatology Research Alliance (CARRA). 2014. Clinically inactive disease in a cohort of children with new-onset polyarticular juvenile idiopathic arthritis treated with early aggressive therapy: time to achievement, total duration, and predictors. *J Rheumatol* 41:1163-70.
- 50.** Wallace CA, Ringold S, Bohnsack J, Spalding SJ, Brunner HI, Milojevic D, Schanberg LE, Higgins GC, O'Neil KM, Gottlieb BS, Hsu J, Punaro MG, Kimura Y, Hendrickson A. 2014. Extension study of participants from the trial of early aggressive therapy in juvenile idiopathic arthritis. *J Rheumatol*. 41:2459-65.
- 51.** Mina R, Klein-Gitelman MS, Nelson S, Eberhard BA, Higgins G, Singer NG, Onel K, Tucker L, O'Neil KM, Punaro M, Levy DM, Haines K, Ying J, Brunner HI. 2015. Effects of

obesity on health-related quality of life in juvenile-onset systemic lupus erythematosus. *Lupus* 24:191-7.

52. Brunner HI, Silva CA, Reiff A, Higgins GC, Imundo L, Williams CB, Wallace CA, Aikawa NE, Nelson S, Klein-Gitelman MS, Rose SR. 2015. Randomized, double-blind, dose-escalation trial of triptorelin for ovary protection in childhood-onset systemic lupus erythematosus. *Arthritis Rheumatol.* 67:1377-85.

53. Cabral DA, Canter DL, Muscal E, Nanda K, Wahezi DM, Spalding SJ, Twilt M, Benseler SM, Campillo S, Charuvanij S, Dancey P, Eberhard BA, Elder ME, Hersh A, Higgins GC, et al. 2016. Comparing Presenting Clinical Features in 48 Children With Microscopic Polyangiitis to 183 Children Who Have Granulomatosis With Polyangiitis (Wegener's): An ARChiVe Cohort Study. *Arthritis Rheumatol.* 68:2514-26.

54. Jensen PT, Karnes J, Jones K, Lehman A, Rennebohm R, Higgins GC, Spencer CH, Ardoin SP. 2015. Assessment of transition readiness in adolescents and young adults with chronic health conditions. *Pediatr Rheumatol Online J.* May 24:13:17.

55. Jensen PT, Paul GV, LaCount S, Peng J, Spencer CH, Higgins GC, Boyle B, Kamboj M, Smallwood C, Ardoin SP, 2017. Quantitative evaluation of a pediatric rheumatology transition program. *Pediatr Rheumatology Online J.* Sep 9:15(1):70.

C. Research Support

COMPLETED RESEARCH SUPPORT (PAST 4 YEARS)

Higgins (Site PI)

5/2009 – 2015

Abbott

A Long-term, Multi-center, Longitudinal Post-marketing Observational Registry of Humira (Adalimumab) in Children with Active Juvenile Idiopathic Arthritis (JIA).

Goal: To study safety of marketed adalimumab in JIA

Higgins (site PI)

12/2009 -2015

Novartis

An open-label extension study of canakinumab (ACZ885) in patients with Systemic Juvenile Idiopathic Arthritis (SJIA) and active systemic manifestations.

Goal: To study safety of canakinumab in SJIA

Glass, Thompson (PI)

3/1/09 – 2015

NIH

Integrative Genomics of Juvenile Idiopathic Arthritis

Goal: To identify genes which are associated with different subsets of JIA

Role: Co-investigator

Li (PI)

5/1/12 - 4/31/13

Arthritis Foundation

Developing Tools for Localized Scleroderma Comparative Effectiveness Studies.

Goal: To refine the previously developed tools, and develop new tools, for activity and damage in jLS

Role: Co-investigator

Goal: as per title

Role: Site investigator