

**BIOGRAPHICAL SKETCH**

Provide the following information for the Senior/key personnel and other significant contributors.  
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: David Matthew Maahs

eRA COMMONS USER NAME (credential, e.g., agency login): Maahs.D

POSITION TITLE: Lucile Salter Packard Professor of Pediatrics & Chief of Endocrinology, Stanford University

**EDUCATION/TRAINING**

INSTITUTION AND LOCATION	DEGREE	Completion Date	FIELD OF STUDY
University of Kansas, Lawrence, KS	B.A.	06/1988	English
University of Kansas, Lawrence, KS	M.A.	06/1990	English
University of New Mexico, Albuquerque, NM	M.D.	06/1997	Medicine
University of New Mexico, Albuquerque, NM	Residency	06/2000	Pediatric Resident
University of Colorado Denver, Denver, CO	Fellowship	06/2006	Pediatric Endocrinology
University of Colorado Denver, Denver, CO	PhD	06/2010	Epidemiology

**A. Personal Statement**

My research interest is to improve care, outcomes, and quality of life in people with diabetes. Specifically, my research has extended from epidemiologic studies identifying gaps in care to development of hypotheses to test interventions in clinical trials. My NIDDK sponsored K23 "Cardiovascular Disease in Type 1 Diabetes Mellitus: Young Adults to Adolescents" focused on cardiovascular and kidney complications in young adults with type 1 diabetes (T1D). I continued this work as part of the Coronary Artery Calcification in Type 1 Diabetes (CACTI) Study and as an investigator with the Search for Diabetes in Youth study. I am a past co-Chair for Protocols and Publications with the Type 1 Diabetes Exchange and continue as director of international collaborations, which complements my roles as Secretary-General and now President of ISPAD. While in Colorado I was local PI on two NIDDK funded UC4 studies: PERL, an RCT to prevent early kidney function decline and FLEX, an innovative behavioral intervention for adolescents with T1D. My research increasingly focused on diabetes technology to improve quality of life and time-in-range with an emphasis on translating diabetes technology from research to the clinic to reduce disparities in care. In Colorado I was the site PI on 3 UC4 funded automated insulin delivery studies and I continue this research at Stanford with Drs Buckingham and Hood. I have worked with clinical and engineering collaborators at multiple institutions on JDRF, NIDDK, and NSF funded studies. With the expansion of diabetes technology into clinical care, we have identified local, national, and international disparities and designed projects (4T Study, ECHO Diabetes) with a multi-disciplinary team of researchers to provide the best possible care to all people with diabetes. Mentorship and education of the next generation of physician-scientists has been an important part of my career. I was co-PI with Dr. Klingensmith on the Barbara Davis Center T32 and K12 training grants in Pediatric Endocrinology and co-author with Dr Chase on the 12<sup>th</sup> and 13<sup>th</sup> editions of *Understanding Diabetes*, or Pink Panther education books. I currently serve as the Associate Director for the NIDDK P30 funded Stanford Diabetes Research Center (SDRC), PI of the Stanford K12 "Training Research Leaders in Type 1 Diabetes," and corresponding PI for the National K12 DiabDocs Training program. The goal of the DiabDocs Training program is to develop the next generation of physician-scientists focused on research in T1D.

**Ongoing and recently-completed projects that I would like to highlight include:****Ongoing Research Support**

**MPI Maahs (contact) and DiMeglio, K12**

07/2022 - 06/2027

Diabetes-Docs: Physician-Scientist Career Development Program (DiabDocs)

Goals: The education and training of Pediatric and Adult endocrinologists for academic research careers with a focus on Type 1 Diabetes. Role: PI

**1R18DK122422 (PI D Maahs)**

02/2019 - 01/2025

Teamwork, Targets, Technology, and Tight Control in Newly Diagnosed Pediatric T1D: 4T Study

Goal: To implement proven methods and emerging diabetes technology into our clinical practice to sustain tight glucose control from the onset of Type 1 Diabetes and optimize patient reported and psychosocial outcomes. Role: PI

**PI Johari, co-I Maahs, Prahalad, Fox, Scheinker NSF, 2205084**

09/2022 - 08/2026

SCH: Improving patient health and equity through the digital transformation of diabetes care delivery

Goals: The focus of this proposal is the data-driven digital transformation of diabetes care, by combining novel sources of sensor data with dashboards and visualizations that improve patient health while more efficiently allocating scarce provider resources. Role: co-I

**PI Guestrin, co-I Maahs, Fox, Johari, Prahalad, Rose, Stanford HAI**

09/2022 - 08/2023

EAE Scores: A Framework for Explainable, Actionable and Equitable Risk Scores for Healthcare Decisions

Goals: Optimize care using advanced techniques in statistics, machine learning and operations research.

**PI Appel, co-I Maahs, JDRF**

Ultrafast Insulin-Pramlintide Co-formulations

01/2022 - 12/2023

Goals: In this project, we are developing insulin-pramlintide co-formulations and evaluating their efficacy at managing mealtime glucose in diabetic rates and pigs.

**PI Maahs, co-PI Zaharieva, Helmsley Charitable Trust**

05/2020 - 04/2024

Exercise Education at New Onset of T1D

Goal: To assess the feasibility of integrating exercise education via telemedicine at new onset of type 1 diabetes (T1D) for pediatric people with T1D and their families. Ancillary study to R18 4T Study. Role: co-I

**1P30DK11607401 (PI- S. Kim, Co- PI D. Maahs)**

07/2017 - 06/2027

Stanford Diabetes Research Center

Goal: To foster discovery, application and translation of scientific knowledge about diabetes and it's complications to innovate advances in diabetes research and improved diabetes care. Role: Associate Director

**1K12DK122550-01 (PI D. Maahs)**

07/2019 - 06/2024

Training Research Leaders in Type 1 Diabetes Goal: The education and training of researchers for academic careers in Pediatric and Adult Endocrinology with a specific focus on T1D. Role: PI

**(PI D. Maahs, Co-PI Haller)**

07/2019 - 06/2023

Expansion & Evaluation of ECHO for People on Intensive Insulin Therapy, Helmsley Charitable Trust

Goal: Improve patient-level outcomes for underserved adults and children with T1D in California and Florida. Role: PI

**1R44DK121606-01 (PI Syage & D. Maahs site PI)**

09/2020 – 07/2023

A Clinical Study of Latiglutenase as a Treatment for Type 1 Diabetics with Celiac Disease

Goal: Develop Phase 1 Clinical Trial protocol for SBIR mechanism. Role: PI (site)

**1R01DK11925401 (PI- R. Appel, Co-PI D. Maahs)**

01/2019 - 12/2023

Co-Formulation of Amylin Analogues with Insulin Analogues for Treatment of Diabetes

Goals: To develop a novel co-formulation of insulin analogues with an amylin analogue to enable a transformational new treatment for diabetes constituting a true replacement therapy. Role: co-I

**Recent Citations to Highlight:**

- 1) LA DiMeglio, A Albanese-O'Neill, CE Muñoz, **DM Maahs**. COVID-19 and Children with Diabetes Updates, Unknowns, and Next Steps: First, Do No Extrapolation. *Diabetes Care*. 2020 Nov;43(11):2631-2634. PMID: 32887703.

- 2) A Addala and M Auzanneau, K Miller, W Maier, N Foster, T Kapellen, A Walker, J Rosenbauer, **DM Maahs** and RW Holl. A Decade of Disparities in Diabetes Technology Use and HbA1c in Pediatric Type 1 Diabetes: A Trans-Atlantic Comparison. *Diabetes Care*. 2021 Jan;44(1):133-140. PMID: 32938745.
- 3) MJ Redondo, I Libman, **DM Maahs**, SK Lyons, M Saraco, J Reusch, H Rodriguez, and LA DiMeglio. The Evolution of Hemoglobin A1C Targets for Youth with Type 1 diabetes: Rationale and Supporting Evidence. *Diabetes Care*. 2021 Feb;44(2):301-312. PMID: 33431422.
- 4) P Prahalad, VY Ding, DP Zaharieva, A Addala, R Johari, D Scheinker, M Desai, K Hood, **DM Maahs**. Teamwork, Targets, Technology, and Tight Control in Newly Diagnosed Type 1 Diabetes: Pilot 4T Study, *JCEM*, 2022 Mar 24;107(4):998-1008. PMID: 34850024.

## **B. Positions, Scientific Appointments, and Honors**

### **Positions and Scientific Appointments**

**2023-present Associate Dean for Research, School of Medicine, Stanford University**

**2021-present Associate Chair for Academic Affairs, Department of Pediatrics**

**2021-present Lucile Salter Packard Professor of Pediatrics (Endowed Chair)**

**2022-2024 President, ISPAD, Executive Board 2021-25**

2020-present Observational Study Monitoring Board for NIDDK funded "Glycemic Observation and Metabolic Outcomes in Mothers and Offspring" (GO MOMs) study, Chair.

2018-present Courtesy appointment, Health Research and Policy (Epidemiology), Stanford University

2017-2020 Editorial Board, Journal of Pediatrics

2017-2019 Professional Practice Committee, American Diabetes Association

2017-2019 Associate Editor, Diabetic Medicine

**2016-present Professor and Division Chief, Pediatric Endocrinology, Stanford University**

2016-present Associate Director, NIDDK P30 funded Stanford Diabetes Research Center

**2016-2020 Secretary-General, ISPAD**

2016-2018 Editor in Chief, ISPAD Clinical Practice Consensus Guidelines

2016 Professor, Pediatric Endocrinology, BDC, UCD

2015 Secretary-General elect, International Society of Pediatric and Adolescent Diabetes (ISPAD)

2014-2015 ADA Scientific Sessions Planning Committee, Clinical Diabetes/Therapeutics YOUTH

2014-2015 Scientific Advisory Board, International Society for Pediatric and Adolescent Diabetes

2013-2020 Editorial Board, Diabetes Technology and Therapeutics

2013-2018 Type 1 Diabetes Exchange, Steering Committee

2013-2016 Type 1 Diabetes Exchange, Co-Chair for Publications and Protocol Development

2012-2014 Committee Member/Editorial team member, ISPAD Guidelines

2011-2016 Associate Professor, Pediatric Endocrinology, BDC, UCD

2011-2016 Secondary Appointment in Division of Renal Diseases and Hypertension, UCD

2011-2016 Secondary Appointment in Dept of Epidemiology, Colorado School of Public Health, UCD

2011-2013 Associate Editor, Diabetes Technology and Therapeutics

2006-2011 Assistant Professor, Pediatric Endocrinology, Barbara Davis Center (BDC) for Childhood Diabetes, University of Colorado Denver (UCD)

2003-2006 Fellow, Pediatric Endocrinology, U of Colorado Health Sciences Center, Denver, CO

2001-2003 Medical Director, Pediatric Sub-Acute Unit, UNM Hospital, Albuquerque, NM

2000-2003 Clinical Assistant Professor of Pediatrics, UNM Hospital, Albuquerque, NM

1997-2000 Pediatric Resident, University of New Mexico (UNM) Hospital, Albuquerque, NM

1991-1992 Instructor in English, U.S. Peace Corps, Ecole Normale Supérieure, Bangui, Central African Republic

1990-1991 Instructor in English, U.S. Peace Corps, Ecole Normale Supérieure, Sousse, Tunisia

### **Awards and Honors**

1999-2000 Chief Resident for Education, University of New Mexico Department of Pediatrics

2000 Outstanding Teacher Award, Pediatric Residency Program, Albuquerque, NM

1994 Summer Research Grant, Department of History and Philosophy of Medicine, University of Kansas School of Medicine, Kansas City, KS

## C. Contributions to Science

1. **Cardiovascular (CVD) and Renal Complications of T1D:** CVD is the leading cause of death for people with T1D and renal disease continues to cause early morbidity and mortality and increase health costs for people with T1D. I have worked with national groups (SEARCH, PERL) to investigate early CVD/renal disease and their risk factors in people with T1D, including being 1<sup>st</sup> author on an AHA Scientific Statement on CVD risk factors in youth with diabetes.
  - a. **DM Maahs**, L Ogden, G L. Kinney, P Wadwa, J Snell-Bergeon, J Hokanson, D Dabelea, J Ehrlich, RH Eckel, M Rewers. Low Plasma Adiponectin Levels Predict Progression of Coronary Artery Calcification, *Circulation*. 2005;111:747-753. PMID: 15699257.
  - b. **DM Maahs**, BM Snively, G Imperatore, R Bell, EJ Mayer-Davis, L Dolan, DJ Pettitt, I Hirsch, B Rodriguez, B Linder, S Marcovina, D Dabelea. Prevalence and Determinants of Elevated Albumin to Creatinine Ratio in Youth with Diabetes: The SEARCH for Diabetes in Youth Study, *Diabetes Care*. 2007;30:2593-8. PMID: 17630264.
  - c. **DM Maahs**, Chair; S Daniels, SD deFerranti, HL Dichek, J Flynn, BI Goldstein, AS Kelly, KJ Nadeau, P Martyn-Nemeth, S Osganian, L Quinn, AS Shah, E Urbina, Co-Chair, on behalf of the Atherosclerosis, Hypertension & Obesity in Youth Committee of the Cardiovascular Disease in the Young Council of the American Heart Association. AHA Scientific Statement. Cardiovascular Disease Risk Factors in Youth with Diabetes: A Scientific Statement From the American Heart Association. *Circulation*. 2014 Oct 21;130:1532-58. PMID: 25170098.
  - d. A Doria, A. Galecki, C Spino, R Pop-Busui, DZ Cherney, I Lingvay, A Parsa, P Rossing, R Sigal, M Afkarian, R Aronson, ML Caramori, J Crandall, I de Boer, T Elliott, A Goldfine, JS Haw, I Hirsch, A Karger, **DM Maahs**, J McGill, M Molitch, B Perkins, S Polsky, M Pragnell, W Robiner, S Rosas, P Senior, K Tuttle, G Umpierrez, A Wallia, R Weinstock, C Wu, M Mauer, on behalf of the PERL Study Group. Serum Urate Lowering with Allopurinol and Renal Function in Type 1 Diabetes. *New England Journal of Medicine*, 2020 Jun 25;382(26):2493-2503. PMID: 32579810.
2. **Epidemiologic/Registry of T1D:** National and international studies (including in a leadership role with the T1D Exchange) have *identified shortcomings in current T1D care* and contributed to changes in guidelines and development of clinical trials to test interventions to improve care for people with T1D.
  - a. JR Wood, KM Miller, **DM Maahs**, RW Beck, LA DiMeglio, IM Libman, M Quinn, WV Tamborlane, and SE Woerner, for the T1D Exchange Clinic Network. Most Youth with Type 1 Diabetes in the T1D Exchange Clinic Registry do not Meet ADA or ISPAD Clinical Guidelines. *Diabetes Care*. 2013;36:2035-7. PMID: 23340893.
  - b. **DM Maahs**, JM Hermann, SN DuBose, KM Miller, B Heidtmann, LA DiMeglio, B Rami-Merhar, RW Beck, E Schober, WV Tamborlane, TM Kapellen, and RW Holl for the DPV Initiative and the T1D Exchange Clinic Network. Contrasting the Clinical Care and Outcomes of 2,622 Children with Type 1 Diabetes less than 6 Years of Age in the United States T1D Exchange and German/Austrian DPV Registries. *Diabetologia*. 2014;57:1578-85. PMID: 24893863.
  - c. KM Miller, NC Foster, RW Beck, RM Bergenstal, SN DuBose, LA DiMeglio, **DM Maahs**, and WV Tamborlane for the T1D Exchange Clinic Network. Current state of type 1 diabetes treatment in the US: Updated data from the T1D Exchange Clinic Registry. *Diabetes Care*. 2015;38:971–978.
  - d. Foster NC, Miller KM, DiMeglio LA, **Maahs DM**, Tamborlane WV, Bergenstal RM, Clements MA, Rickels MR, Smith E, Olson BA, Beck RW. State of type 1 diabetes management and outcomes from the T1D Exchange in 2016-2018. *Diabetes Technol Thera*. 2019 Feb;21(2):66-72. PMID: 30657336.
3. **Behavioral & Nutritional Challenges of T1D:** The day-to-day management of T1D imposes tremendous burden on people with T1D and their families. These psychosocial challenges require advances in clinical care to reduce the burden of care and improve patient outcomes. Therefore, work in this area has spanned from epidemiologic investigations (CACTI, T1D Exchange) to being a PI of the FL3X study.
  - a. N Gendelman, JK Snell-Bergeon, K McFann, G Kinney, RP Wadwa, F Bishop, M Rewers, **DM Maahs**. Prevalence and Correlates of Depression in Persons with and without Type 1 Diabetes. *Diabetes Care* 2009;32:575-579. PMC2660458.
  - b. PM Trief, D Xing, N Foster, **DM Maahs**, JM Kittelsrud, BA Olson, LA Young, AL Peters, RM Bergenstal, KM Miller, RW Beck, RS Weinstock, for the T1D Exchange Clinic Network. Depression in Adults in the T1D Exchange Clinic Registry. *Diabetes Care*. 2014;37:1563-72. PMID: 24855157.

- c. G Spiegel, A Bortsov, FK Bishop, D Owen, GJ Klingensmith, EJ Mayer-Davis, **DM Maahs**. Randomized Nutrition Education Intervention to Improve Carbohydrate Counting in Adolescents with Type 1 Diabetes Study: Is More Intensive Education Needed? *J Acad Nutr Diet*. 2012; 112:1736-46. PMC3487717.
  - d. Mayer-Davis EJ, **Maahs DM**, Seid M, Crandell J, Bishop FK, Driscoll KA, Hunter CM, Kichler JC, Standiford D, Thomas JM; FLEX Study Group. Efficacy of the Flexible Lifestyles Empowering Change intervention on metabolic and psychosocial outcomes in adolescents with type 1 diabetes (FLEX): a randomised controlled trial. *Lancet Child Adolesc Health*. 2018 Sep;2(9):635-646. PMID: 30119757.
4. **Diabetes Technology and Glucose Control:** My research has focused on the development of diabetes technology and increasingly on its translation to clinical use. Improved glucose control is the best proven method to prevent the complications of T1D and to reduce the burden of care of diabetes. I collaborate with clinical, engineering, and psychosocial collaborators on JDRF, NIDDK, and NSF funded studies.
- a. **DM Maahs**, P Calhoun, BA Buckingham, P Chase, I Hramiak, J Lum, F Cameron, BW Bequette, T Aye, HT Paul, R Slover, P Wadwa, DM Wilson, C Kollman, and RW Beck, for the In Home Closed Loop Study Group. A randomized trial of a home system to reduce nocturnal hypoglycemia in type 1 diabetes. *Diabetes Care*. 2014;37:1885-91. PMID: 24804697.
  - b. M Breton, D Cherňavsky, G Forlenza, M DeBoer, J Robic, RP Wadwa, L Messer, B Kovatchev, **DM Maahs**. Closed Loop Control During Intense Prolonged Outdoor Exercise in Adolescents with Type 1 Diabetes: The Artificial Pancreas Ski Study. *Diabetes Care*. 2017 Dec;40(12):1644-1650. PMID: 28855239.
  - c. DiMeglio LA, Acerini CL, Codner E, Craig ME, Hofer SE, Pillay K, **Maahs DM**. ISPAD Clinical Practice Consensus Guidelines 2018: Glycemic control targets and glucose monitoring for children, adolescents, and young adults with diabetes. *Pediatr Diabetes*. 2018 Oct;19 Suppl 27:105-114. PMID: 30058221
  - d. P Prahalad, A Addala, D Scheinker, KK Hood, **DM Maahs**. CGM Initiation Soon After Type 1 Diabetes Diagnosis Results in Sustained CGM Use and Wear Time. *Diabetes Care*, 2020 Jan;43(1):e3-e4. PMID: 31558548.
5. **Disparities in Diabetes Care:** My experience with patient care and national/international research groups has made obvious the gross disparities in diabetes care in the US exacerbated by barriers to diabetes technology. Our work aims to identify and then address these disparities.
- a. Miller KM, Beck RW, Foster NC, **Maahs DM**. HbA1c Levels in Type 1 Diabetes from Early Childhood to Older Adults: A Deeper Dive into the influence of technology and socio-economic status on HbA1c in the T1D Exchange Clinic Registry Findings. *Diabetes Technol Ther*. 2020 Sep;22(9):645-650. PMID: 31905008.
  - b. A Addala, **DM Maahs**, D Scheinker, S Chertow, B Leverenz and P Prahalad. Uninterrupted Continuous Glucose Monitoring Access is Associated with a Decrease in HbA1c in Youth with Type 1 Diabetes and Public Insurance. *Pediatric Diabetes*, 2020 Nov;21(7):1301-1309. PMID: 32681582.
  - c. AF Walker, KK Hood, MJ Gurka, SL Filipp, C Anez-Zabala, N Cuttriss, MJ Haller, X Roque, D Naranjo, G Aulisio, A Addala, J Konopack, S Westen, K Yabut, E Mercado, S Look, B Fitzgerald, J Maizel, **DM Maahs**. Barriers to Technology Use and Endocrinology Care for Underserved Communities with Type 1 Diabetes. *Diabetes Care*. 2021 Jul;44(7):1480-1490. PMID: 34001535.
  - d. A Addala, S Hanes, D Naranjo, **DM Maahs**, KK Hood. Provider Implicit Bias Impacts Pediatric Type 1 Diabetes Technology Recommendations: Findings from The Gatekeeper Study. *J Diabetes Sci Technol* 2021 Sep;15(5):1027-1033. PMID: 33858206.

#### Complete List of Published Work in MyBibliography:

<http://www.ncbi.nlm.nih.gov/pubmed?otool=uchscilib&term=maahs%20d&cmd=search>