

# BONNIE THIEL

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## SUMMARY

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Data scientist with 15+ years of experience in statistical modeling of experimental and population data. Expert in building statistical models in R and SAS, hypothesis testing and power/sample size estimates. Managed projects and data collection processes for tuberculosis research projects including database design and construction for a large TB consortium. Interested in applying statistical and bioinformatics tools to answer questions in biology and medicine.

## EDUCATION

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Case Western Reserve University, Cleveland, OH  
Ph.D. Systems Biology and Bioinformatics, 2021

Case Western Reserve University, Cleveland, OH  
M.S. Epidemiology and Biostatistics, 1997

University of Colorado, Boulder, CO  
B.S. Molecular, Cellular and Developmental Biology and Biochemistry, 1988

## EXPERIENCE

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2003 – present

**Specialist III** Case Western Reserve University, Tuberculosis Research Unit, Department of Medicine

- Statistical analysis of epidemiologic and experimental data relating to tuberculosis infection and disease
- Bioinformatics analysis including proteomics, transcriptomics and genomics
- Project and data management for a large international research consortium
- Production of manuscripts, reports, protocols and procedures

PI: Dr. Henry W Boom. [whb@case.edu](mailto:whb@case.edu).

2001-2003

**Specialist II** Case Western Reserve University, Department of Epidemiology and Biostatistics

1996-2001

**Specialist I** Case Western Reserve University, Department of Epidemiology and Biostatistics

- Statistical analysis and modeling of data in molecular and genetic epidemiology.
- Synthesis and summary of analysis in the form of reports and publications.

*PI: Dr. Nicholas Schork, Professor*

1994-1996

**Research Assistant II** Case Western Reserve University, Department of Genetics

- Lab manager duties included maintaining equipment and ordering supplies.
- Performed molecular genetic experiments using human and animal DNA and RNA including genotyping and mutation analysis.
- Tissue culture experience included growing and transforming human lymphocytes and harvesting DNA.

*PI: Dr. Aravinda Chakravarti, Professor*

1993

**Student Assistant** Case Western Reserve University, Department of Epidemiology and Biostatistics

- Involved in primary data collection for a study on peripheral vascular disease
- Interviewed patients and tracked data collection.

1991-1994

**Technologist B** The Cleveland Clinic Foundation, Department of Immunology.

- Worked on projects involving the molecular biology and protein chemistry of nitric oxide synthase.
- Gained experience in techniques including expression vector systems, transient and stable transfection and RNA and DNA purification.

*PI: Dr. Dennis Stuehr, Staff*

1989-1990

**Technician II** Cornell University Medical College, Department of Cell Biology.

- Contributed to a study on the nerve growth factor receptor.

- Performed receptor-ligand binding assays, Scatchard analysis, crosslinking reactions, iodinations, transfection, nick translation and western and northern blotting.

*Supervisor: Dr. Barbara Hempstead, Professor*

## SKILLS

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Statistical: Expert level in modeling and prediction applied to data derived from experimental settings, clinical studies, large population studies and data repositories. Working knowledge of machine learning techniques.

Programming: High level SAS and R programming for statistical analysis and data management, experience with Unix/Linux computing systems and scripting

Software Tools: REDCap, OpenClinica, GraphPad, Powerpoint, Access, Word

Additional skills: Study design, power and sample size calculation, data management, database systems, data collection design and process, quality control/ assessment.

## PUBLICATIONS

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**Thiel BA**, Worodria W, Nalukwago S, Nsereko M, Sanyu I, Rejani L, Zawedde J, Canaday DH, Stein CM, Chervenak KA, Malone LL, Kiyemba R, Silver RF, Johnson JL, Mayanja-Kizza H, Boom WH. Immune cells in bronchoalveolar lavage fluid of Ugandan adults who resist versus those who develop latent Mycobacterium tuberculosis infection. *PLoS ONE*. 2021;16.

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Weiner J, 3rd, Maertzdorf J, Sutherland JS, Duffy FJ, Thompson E, Suliman S, McEwen G, **Thiel B**, Parida SK, Zyla J, Hanekom WA, Mohny RP, Boom WH, Mayanja-Kizza H, et al. Metabolite changes in blood predict the onset of tuberculosis. *Nature Communications*. 2018;9. <https://doi.org/10.1038/s41467-018-07635-7>

Ronacher K, Chegou NN, Kleynhans L, Djoba Siawaya JF, du Pleiss N, Loxton AG, Maasdorp E, Tromp G, Kidd M, Stanley K, Kriel M, Menezes A, Gutschmidt A, van der Spuy GD, Warren RM, Dietze R, Okwera A, **Thiel B**, Belisle JT, Cliff JM, Boom WH, Johnson JL, van Helden PD, Dockrell HM, Walzl G. Distinct serum biosignatures are associated with different tuberculosis treatment outcomes. *Tuberculosis*. 2019;118.

<https://doi.org/10.1016/j.tube.2019.101859>

Duffy FJ, Weiner J, Hansen S, Tabb DL, Suliman S, Thompson E, Maertzdorf J, Shankar S, Tromp G, Parida S, Dover D, Axthelm MK, Sutherland JS, Dockrell HM, Ottenhoff THM, Scriba TJ, Picker LJ, Walzl G, Kaufmann SHE, Zak DE. **The GC6-74 Consortium**. Immunometabolic Signatures Predict Risk of Progression to Active Tuberculosis and Disease Outcome. *Frontiers In Immunology*. 2019;10:527.

<https://doi.org/10.3389/fimmu.2019.00527>

Dousa KM, Hamad A, Albirair M, Al Soub H, Elzouki AN, Alwakeel M, **Thiel BA**, Johnson JL. Impact of diabetes mellitus on the presentation and response to treatment of adults with pulmonary tuberculosis in Qatar. *Open Forum Infectious Disease*. 2019;6. <https://doi.org/10.1093/ofid/ofy335>

Stein CM, Zalwango S, Malone LL, **Thiel B**, Mupere E, Nsereko M, Okware B, Kisingo H, Lancioni CL, Bark CM, Whalen CC, Joloba ML, Boom WH, Mayanja-Kizza H. Resistance and Susceptibility to Mycobacterium Tuberculosis Infection and Disease in Tuberculosis Households in Kampala, Uganda. *Am J Epidemiol*. 2018;187:1477. <https://doi.org/10.1093/aje/kwx380>

Suliman S, Thompson E, Sutherland J, Weiner Rd J, Ota MOC, Shankar S, Penn-Nicholson A, **Thiel B**, Erasmus M, Maertzdorf J, Duffy FJ, Hill PC, Hughes EJ, Stanley K, Downing K, Fisher ML, Valvo J, Parida SK, van der Spuy G, Tromp G, Adetifa IMO, Donkor S, Howe R, Mayanja-Kizza H, Boom WH, Dockrell H, Ottenhoff THM, Hatherill M, Aderem A, Hanekom WA, Scriba TJ, Kaufmann SH, Zak DE, Walzl G Four-gene Pan-African Blood Signature Predicts Progression to Tuberculosis. *Am J Respir Crit Care Med*. 2018;197:1198. <https://doi.org/10.1164/rccm.201711-2340OC>

Duffy FJ, Thompson E, Downing K, Suliman S, Mayanja-Kizza H, Boom WH, **Thiel B**, Weiner Iii J, Kaufmann SHE, Dover D, Tabb DL, Dockrell HM, Ottenhoff THM, Tromp G, Scriba TJ, Zak DE, Walzl G, et al. A Serum Circulating miRNA Signature for Short-Term Risk of Progression to Active Tuberculosis Among Household Contacts. *Frontiers In Immunology*. 2018;9:661. <https://doi.org/10.3389/fimmu.2018.00661>

Bark CM, **Thiel BA**, Ogwang S, Sekitoleko G, Muzanyi G, Joloba ML, Johnson JL. Sputum smear-positive, culture-negative state during anti-tuberculosis treatment in the MGIT liquid culture era. *The International Journal of Tuberculosis and Lung Disease*. 2018;33:306. <https://doi.org/10.5588/ijtld.17.0655>

Alsultan A, Furin JJ, Du Bois J, van Brakel E, Chheng P, Venter A, **Thiel B**, Debanne SA, Boom WH, Diacon AH, Johnson JL, Peloquin CA. Population Pharmacokinetics of AZD-5847 in Adults with Pulmonary Tuberculosis. *Antimicrob Agents Chemother*. 2016;60:6591. <https://doi.org/10.1128/AAC.01163-16>

Zak DE, Penn-Nicholson A, Scriba TJ, Thompson E, Suliman S, Amon LM, Mahomed H, Erasmus M, Whatney W, Hussey GD, Abrahams D, Kafaar F, Hawkrigde T, Verver S, Hughes EJ, Ota M, Sutherland J, Howe R, Dockrell HM, Boom WH, **Thiel B**, Ottenhoff THM, Mayanja-Kizza H, Crampin AC, Downing K, Hatherill M, Valvo J, Shankar S, Parida SK, Kaufmann SHE, Walzl G, Aderem A, Hanekom WA. A blood RNA signature for tuberculosis disease risk: a prospective cohort study. *Lancet*. 2016;387:2312. [https://doi.org/10.1016/S0140-6736\(15\)01316-1](https://doi.org/10.1016/S0140-6736(15)01316-1)

Furin JJ, Du Bois J, van Brakel E, Chheng P, Venter A, Peloquin CA, Alsultan A, **Thiel BA**, Debanne SM, Boom WH, Diacon AH, Johnson JL. Early bactericidal activity of AZD5847 in patients with pulmonary tuberculosis. *Antimicrobial Agents and Chemotherapy*. 2016;60:6591. <https://doi.org/10.1128/AAC.01163-16>

**Thiel BA**, Bark CM, Nakibali JG, van der Kuyp F, Johnson JL. Reader variability and validation of the Timika X-ray score during treatment of pulmonary tuberculosis. *IJTLD* 2016; 20:1358. <https://doi.org/10.5588/ijtld.16.0186>

Benghiac AG, **Thiel BA**, Haba D. Reliability of the frontal sinus index for sex determination using CBCT. *Romanian Journal of Legal Medicine*. 2015;23:275. <https://doi.org/10.4323/rjlm.2015.275>

Chen J, Leskov IL, Jr AY, **Thiel B**, Kevil CG, Stokes KY, Orr AW. Recruitment of the adaptor protein Nck to PECAM-1 couples oxidative stress to canonical NF- $\kappa$ B signaling and inflammation. *Sci Signal*. 2015;8:ra20. <https://doi.org/10.1126/scisignal.2005648>

Revsbech IG, Shen X, Chakravarti R, Jensen FB, **Thiel B**, Evans AL, Kindberg J, Frobert, O, Stuehr DJ, Kevil, CG, Fago A. Hydrogen sulfide and nitric oxide metabolites in the blood of free-ranging brown bears and their potential roles in hibernation. *Free Radic Biol Med*. 2014;73:349. <https://doi.org/10.1016/j.freeradbiomed.2014.05.025>

Ma N, Zalwango S, Malone LL, Nsereko M, Wampande EM, **Thiel BA**, Okware B, Igo RP Jr, Joloba ML, Mupere E, Mayanja-Kizza H, Boom WH, Stein CM. Clinical and epidemiological characteristics of individuals resistant to M tuberculosis infection in a longitudinal TB household contact study in Kampala, Uganda. *BMC Infect Dis*. 2014;14:352. <https://doi.org/10.1186/1471-2334-14-352>

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Johnson JL, Geldenhuys H, **Thiel BA**, Toefy A, Suliman S, Pienaar B, Chheng P, Scriba T, Boom WH, Hanekom W, Hatherill M. Effect of isoniazid therapy for latent TB infection on QuantiFERON-TB Gold In-tube responses in tuberculin skin test positive adults in a high TB incidence area: A controlled study. *Chest* 2014;145:612. <https://doi.org/10.1378/chest.13-1232>

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Sutherland JS, Lalor MK, Black GF, Ambrose LR, Loxton AG, Chegou NN, Kassa D, Mihret A, Howe R, Mayanja-Kizza H, Gomez MP, Donkor S, Franken K, Hanekom W, Klein MR, Parida SK, Boom WH, **Thiel BA**, Crampin AC, Ota M, Walzl G, Ottenhoff

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Bark CM, Gitta P, Ogwang S, Nsereko M, **Thiel BA**, Eisenach KD, Boom WH, Joloba ML, Johnson JL. Comparison of time to positive and colony counting in an early bactericidal activity study of anti-tuberculosis treatment *Int J Tuberc Lung Dis* 2013;11:1448. <https://doi.org/10.5588/ijtld.13.0063>

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Bark CM Okwera A, Joloba ML, **Thiel BA**, Nakibali JG, Debanne SM, Boom WH, Eisenach KD and Johnson JL. Time to detection of *Mycobacterium tuberculosis* as an alternative to quantitative cultures. *Tuberculosis*. 2011;91:257. <https://doi.org/10.1016/j.tube.2011.01.004>

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receptors 1 and 2 *Infection and immunity* 2011;79:663.  
<https://doi.org/10.1128/IAI.00806-10>

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Rojas RE, Chervenak KA, Thomas J, Morrow J, Nshuti L, Zalwango S, Mugerwa RD, **Thiel BA**, Whalen CC, Boom WH. Vδ2<sup>+</sup> γδ T Cell Function in *Mycobacterium tuberculosis*- and HIV-1-Positive Patients in the United States and Uganda: Application of a Whole-Blood Assay. *Journal of Infectious Disease* 2005;192:1806.  
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Witte JS, Suarez BK, **Thiel B**, Lin J, Yu A, Banerjee TK, Burmester JK, Casey G, Catelona WJ. Genome-wide scan of brothers: replication and fine mapping of prostate cancer susceptibility and aggressiveness loci *Prostate.* 2003;1:298.  
<https://doi.org/10.1002/pros.10304>

**Thiel B**, Chakravarti A, Cooper R, Lewis S, Lynn A, Tiwari H, Schork NJ and Weder AB. A genome wide linkage analysis investigating the determinants of blood pressure in Caucasians and African Americans. *Amer J Hypertens* 2003;16:151.  
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Province MA, Kardina SLR, Ranade K, Rao DC, **Thiel BA**, Cooper RS, Risch N, Turner ST, Cox DR, Hunt SC, Weder AB, Boerwinkle E. A meta-analysis of genome-wide linkage scans for hypertension: The National Heart Lung and Blood Institute Family Blood Pressure Program *Amer J Hypertens.* 2003;16:144-147.  
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Schork NJ, Gardner JP, Zhang L, Fallin D, **Thiel B**, Jakubowski H, Aviv A. Genomic association/linkage of sodium lithium countertransport in CEPH pedigrees *Hypertension.* 2002;40:619. <https://doi.org/10.1161/01.HYP.0000037131.41957.A8>



Hall MA, Norman P, **Thiel B**, Tiwari H, Peiffer A, Vaughan RW, Prescott S, Leppert M, Schork NJ, Lanchbury JS. Quantitative trait loci on chromosomes 1, 2, 3, 4, 8, 9, 11, 12 and 18 control variation in levels of T and B lymphocyte sub-populations *Am J Hum Genet.* 2002;70:1172. <https://doi.org/10.1086/340090>

Morrison SJ, Qian D, Jerabek L, **Thiel BA**, Park IK, Ford PS, Kiel JM, Schork NJ, Weissman IL, Clark MF. A genetic determinant that specifically regulates the frequency of hematopoietic stem cells *J Immunol.* 2002;168:635. <https://doi.org/10.4049/jimmunol.168.2.635>

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