Harvard Medical School
Curriculum Vitae

Date Prepared: **7 Sept 2023**

Name: **Olga V. Demler**

Dual Appintment:

Assistant Professor, part-time
Brigham and Women's Hospital,
Harvard Medical School
Boston, USA
odemler@bwh.harvard.edu

Senior Scientist Research (permanent), part-time
Computer Science Department
ETH, Zurich, Switzerland
demlero@ethz.ch

Website: **https://olgadem.github.io/**

Education

1992	BS	Pure Mathematics	Novosibirsk State University, Novosibirsk, Russia
1998	MS	Engineering-Economic Systems and Operations Research	Stanford University Stanford, CA
1999	MA	Statistics and Applied Probability	University of California at Santa Barbara Santa Barbara, CA
2012	PhD	Biostatistics (Professor Ralph D'Agostino, Professor Michael Pencina)	Boston University (BU), Boston, MA

Postdoctoral Training

2/13-8/14	Research Fellow	Department of Medicine, (Professor Nancy Cook)	Brigham and Women's Hospital/Harvard Medical School (BWH/HMS), Boston, MA

Faculty Academic Appointments

9/14-7/18	Instructor	Medicine	Harvard Medical School, Boston, MA
7/18-12/21	Assistant Professor	Medicine	Harvard Medical School, Boston, MA
1/22-present	Assistant Professor, part time	Medicine	Harvard Medical School, Boston, MA

1/22-present	Tenured Senior Scientist Research, part time	Computer Science	Swiss Federal Institute of Technology (ETH), Zurich, Switzerland

Appointments at Hospitals/Affiliated Institutions

2014-2022	Associate Biostatistician	Division of Preventive Medicine (DPM)	Brigham and Women's Hospital, Boston, MA
2022-present	Associate Biostatistician, part time	Division of Preventive Medicine (DPM)	Brigham and Women's Hospital, Boston, MA

Honors and Prizes

1999	Graduate Student Scholarship Award for Academic Achievements	Department of Statistics and Applied Probability, the University of California at Santa Barbara, Santa Barbara, CA	Academic achievements
2008	Mu Sigma Rho, the National Statistics Honor Society	Boston Chapter of the American Statistical Association, Boston, MA	Academic achievements in graduate biostatistics program at Boston University
2017	Chair's Research Award	Department of Medicine Brigham and Women's Hospital	2017 Research Performance Incentive Program
2020	Alan M. Lerner young investigator research Award	Cardiovascular Division, Brigham and Women's Hospital	Won the award for our work on "Heterogeneous Effects of Omega-3 (n-3) Downstream Fatty Acids (FAs) and Oxylipins on Risk of Cardiovascular Disease: Results of Two Metabolomics Substudies of the Randomized Vitamin D and Omega-3 Trial (VITAL)."

Report of Funded and Unfunded Projects

Funding Information

Past

2013-2016	Novel applications of risk reclassification methods in cardiovascular disease risk prediction National Institutes of Health (NIH)/National Heart, Lung and Blood Institute (NHLBI) R01 HL113080

Statistician (PI: Cook)
The goal of this project is to develop new methods for comparing risk prediction models, particularly those that are related to reclassification calibration. It will extend these methods to other study designs and settings other than binary outcomes.

2013-2017 High density lipoprotein (HDL) heterogeneity and function, statin therapy, and cardiovascular disease (CVD) outcomes
NIH / NHLBI 1R01HL117861
Statistician (PI: Mora)
The major goal of this project is to evaluate HDL particle heterogeneity and function in relation to randomized statin treatment and prospectively ascertained CVD outcomes in the Justification for the Use of Statin in Prevention: An Intervention Trial Evaluating Rosuvastatin (JUPITER) and Treating to New Targets (TNT) clinical trials.

2014-2015 HDL heterogeneity and function, statin therapy, and CVD outcomes (supplement)
NIH / NHLBI 1R01HL117861 (supplement 1)
Statistician (PI: Mora)
The goal of this project is to use state-of-the-art lipidomics as a tool to more specifically and comprehensively identify lipid biomarkers of normal and dysfunctional HDL.

2016-2020 Inflammatory mediators, cardiovascular health, and longevity in women
NIH/NHLBI R01 AG051654
Statistician (PI: Cheng)
The major goal of this study is to advance our understanding of how upstream inflammatory pathways are related to healthy cardiovascular aging and longevity in women. To achieve this goal, metabolomic profiling will be performed on baseline blood samples of 5,000 participants from the Women's Health Study (WHS) to study associations between cardiovascular and general morbidity outcomes and eicosanoid mediators of systemic inflammation.

2020-2021 Predicting the Severity and Cardiovascular Complications of COVID-19 and the Risk of ACE Inhibitors/ARBs using Machine Learning
Co-PI – ($100,000)
The goal of this project is to identify phenotypes for the severity of COVID-19 clinical presentation, with a particular emphasis on cardiovascular manifestations, using electronic health data.

2018-2022 PROMINENT (The Pemafibrate to Reduce cardiovascular OutcoMes by reducing triglycerides IN diabetic patiENTs)
Associate Statistician at Data Coordinating Center (PI: Ridker)
The Triglyceride Reduction and Acute Cardiovascular Events (TRACE) trial is a randomized, double blind, placebo-controlled, international trial evaluating the ability of the potent PPAR-alpha agonist, K-877, to reduce rates of myocardial infarction, stroke, unstable angina requiring unplanned revascularization, and cardiovascular death in among 10,000 men and women with type 2 diabetes (T2D).

2017-2022 Coronary Heart Disease (CHD) Risk and Metabolomic Profiles of Discordant Lipids

PI – ($809,386 - total direct costs for entire project period beginning in 2017)
This project is designed to combine statistical learning/data mining methods with results of my prior methodological research on impact of correlation on risk prediction models in order to find the most informative combinations of an extended panel of lipid parameters that best predict CHD events and determine metabolomic profiles of individuals with various lipid combinations.

2019-2022 Flexible Framework for Cardiovascular Risk Prediction in a Clinical Setting
American Heart Association Methods Validation Grant 17IGMV33860009
PI – ($184,868 – direct costs)
This project is designed to create a Flexible Framework of cardiovascular risk prediction models by combining existing validated risk prediction models such as Pooled Cohort equations, QRISK3 and MESA with rich longitudinal person-level data available in Partners EHR system.

Current

2021-2023 *Machine learning risk stratification in patients with ASCVD: A personalized approach*
NIH/NHLBI R21 HL156174
Co-I (PI: Mora) – ($268,514)
The goal of this study is to apply new artificial intelligence methods to develop a free and publicly available computer program that will calculate each patient's long-term chance of having or dying from a repeat heart attack or stroke based on his or her individual risk profile.

2019-2023 *Total Plasma and IgG Glycomes, Statin Therapy and ASCVD events*
NIH/NHLBI R01 HL117861
Co-I (PI:Mora)-($3,404,424)
The goal of this study is to advance our understanding of the human glycome by identifying glycosylation patterns related positively or inversely to incident ASCVD
and risk factors, in particular inflammatory and vascular risk factors.

2021-2024 *Plasma Metabolite and Proteome Signatures for Migraine Classification*
NIH R61 NS122074
Co-I (PIs: Chasman, Rist) ($2,065,041)
This proposal seeks to identify and validate plasma-based metabolite and protein signatures for migraine with the goal of improving current approaches to migraine treatment and identifying new therapeutic targets.

2022-2026 *Targeting the Active Resolution of Inflammation for Cardiovascular Disease Prevention*
1 R01 HL160799
Co-I (PI: Mora, S) ($3,404,424)
The aim of this proposal is to comprehensively examine determinants of circulating levels of specialized pro-resolving mediators (SPMs) and their relationships to the resolution or promotion of inflammation and with future CVD risk.

2022-2026 *Rheumatoid Arthritis and the Risk of Cardiovascular Disease: Biomarkers, Risk Prediction, and Underlying Mechanisms*
R01 HL163580
Co-I (PI: Solomon, D).($3,138,853)
The overarching goal of this proposal is to identify protein biomarkers for cardiovascular disease (CVD) in patients with rheumatoid arthritis (RA), leveraging the structure of a randomized controlled trial and rigorous methods for deriving and validating a risk score.

2022-2027 *Decoding mechanisms underlying metabolic dysregulation in obesity and digestive cancer risk*
U01 CA272452
Co-I (PI: Tobias D. / Giovannuci, E. / Zhang, X) ($7,287,767)
The project aims to identify new protein biomarkers and protein signatures for type 2 diabetes, using modern proteomics techniques to comprehensively assess a large set of the

proteins circulating in the bloodstream in order to better understand the complex relationships between proteins, metabolites, diet, lifestyle, and type 2 diabetes.

2023-2024 *Consensus Framework for Cardiovascular Risk Prediction in a Clinical Setting*
R21HL167173
PI: Demler ($268,500)
The goal of this project is to evaluate ways to combine published risk prediction models in real-life clinical setting using Machine Learning models such as Super Learner and eXtreme Gradient Boosting in clinical settings and develop a novel method called the Consensus Framework. This novel method has the consensus property because it combines multiple published and validated risk models to ensure not only good overall performance but also good performance in important subgroups of patients. The Consensus Framework is adapted to clinical practice because it can handle limited information or additional risk factors. We will also assess specific properties of prognostic risk prediction and how they inform the selection of the most appropriate class of models.

2023-2025 *Integrating medical image data and assessments for personalized cardiovascular risk estimation (Dataspectrum4CVD)*
Swiss Data Science Center/PHRT
PI: Demler (CHF286,000)
This project involves integration of full spectrum of data modalities (genetic, raw image data and biomarkers) with novel Machine Learning and Deep Learning approaches in order to improve performance of prognostic models for ASCVD and diagnostic models for coronary artery calcification (CAC) score.

Pending

2024-2025 *Using machine learning/artificial intelligence methods to improve ASCVD risk estimates for misclassified low-risk patients using image, genetic and -omics data*
R21 NIH NHLBI
PI: Demler ($492,250)
The goal of this project is to improve the risk classification of low-risk individuals who constitute up to 30% of those who later develop CVD by integrating the full spectrum of data in UKBiobank and MGB EHR data: we will integrate genetic, image and biomarker data. To achieve this we will develop a diagnostic deep learning model of the CAC score from chest X-rays and other images and additionally, we will to replicate existing published highly accurate machine learning models that use ECG images to extract rich phenotypic data that is not available from traditional human reads.

Report of Local Teaching and Training

Teaching of Students in Courses

Harvard University Courses

2016	Advanced Statistical Learning/Data Mining Methods Dr. Donna Spiegelman's research group: Graduate Students, Postdocs, Research Associates	Harvard T.H. Chan School of Public Health 4-hour course
2018	Metabolomic Studies: from Design Stage to the Validation Stage Graduate Students enrolled in HDSC 325 course	Harvard T.H. Chan School of Public Health. Guest Lecturer Health Data Science Capstone Course HDSC 325

2022	A Crash Course on Convolutional Neural Networks	Harvard T.H. Chan School of Public Health graduate course. Guest Lecturer Introduction to Machine Learning and Risk Prediction EPI288

Other Teaching

2010	Introduction to Statistical Programming Using SAS, lecturer	Boston University, School of Public Health, Boston, MA
	Graduate students	4-hr lectures and 1-hr practice sessions per wk for 12 wks
2012	Introduction to Biostatistics I	Clinical and Translational Science graduate program, Tufts University, Boston, MA
	Masters and PhD students (most with MD degree)	5-hr lectures and office hours per wk for 20 wks

Formal Teaching of Peers (e.g., CME and other continuing education courses)

No presentations below were sponsored by outside entities.

2014-2017	Introduction to Predictive Modeling Center for Clinical Investigation (CCI), Brigham and Women's Hospital	One 4-hour lecture yearly Boston, MA
2018	A Crash Course in Statistical Learning Methods Center for Clinical Investigation (CCI), Brigham and Women's Hospital	One 4-hour lecture Boston, MA
2022	A Three-Day Crash Course in Machine Learning Methods, Center for Clinical Investigation, Brigham and Women's Hospital	Three 3-hour lectures Boston, MA

Local Invited Presentations

No presentations below were sponsored by outside entities.

2012	Improvement of Area Under the Receiver Operating Characteristics Curve (AUC), Significance of New Predictors and Limits of Validity of Some Common AUC Tests Used in Risk Prediction Modeling/ Research Design Center/Biostatistics Research Center Seminar Tufts University Medical School
2012	Impact of New Variables on Discrimination in Risk Prediction Models/invited seminar series lecture Division of Preventive Medicine, BWH
2013	Impact of Correlation on Predictive Ability of a Biomarker/Division Seminar Division of Preventive Medicine, BWH

2014 Improvement of AUC for Risk Prediction Models/colloquium Statistical Methods in Epidemiology Working Group
Harvard TH Chan School of Public Health

2015 Tests of Calibration and Goodness-of-Fit in the Survival Setting/colloquium at Statistical Methods in Epidemiology Working Group
Harvard TH Chan School of Public Health

2018 Asymptotic distribution of ΔAUC, NRIs, and IDI based on theory of U-statistics /colloquium at Statistical Methods in Epidemiology Working Group
Harvard TH Chan School of Public Health

2020 Heterogeneous Effects of Omega-3 Downstream Fatty Acids and Oxylipins on Risk of Cardiovascular Disease: Results of Two Metabolomics Substudies of the Randomized Vitamin D and Omega-3 Trial (VITAL) /Alan M. Lerner Research Symposium, Division of Cardiovascular Medicine, Brigham and Women's Hospital

2020 Building Research Cohort from Partner's Electronic Health Records data /Division of Preventive Medicine Work-in-Progress Seminar

2022 Focus on Disease Mechanisms: Biostatistical Perspective / Division of Preventive Medicine Work-in-Progress Seminar

Report of Regional, National and International Invited Teaching and Presentations

No presentations below were sponsored by outside entities.

National

2011 Misuse of DeLong Test to Compare AUCs of Nested Models/ Oral Presentation
Miami Beach, Florida (Joint Statistical Meetings 2011)

2011 Comparing AUCs of Nested Models/ Oral Presentation
World cardiovascular, diabetes, and obesity online conference (Target Meeting 1st World Cardiovascular, Diabetes, and Obesity Online Conference 2011)

2012 Equivalence of Improvement in Area Under ROC Curve and Linear Discriminant Analysis Coefficient Under Assumption of Normality/ Oral Presentation
San Diego, California (Joint Statistical Meetings 2012)

2013 Impact of Correlation on Predictive Ability of a Biomarker/ Oral Presentation
Montreal, Canada (Joint Statistical Meetings 2013)

2015 Methods for reclassification calibration in the survival setting/ Oral Presentation
Seattle, Washington (Joint Statistical Meetings 2015)

2016 Asymptotic Distribution of ΔAUC, NRI, and IDI Based on U-Statistics Theory/ Oral Presentation
Chicago, Illinois (Joint Statistical Meetings 2016)

2017 Asymptotic Distribution of ΔAUC, NRI, and IDI Based on U-Statistics Theory/ Oral Presentation
Washington, DC (Eastern North American Regional (ENAR) Meeting of International Biometrics Society 2017)

2017 Measures of Predictive Model Performance and Event Rate: How Much They Vary and How to Make Them Comparable across Studies / Oral Presentation
Baltimore, MD (Joint Statistical Meetings 2017)

2018 Powering Biomarker Discovery Studies for Training and Validation / Oral Presentation
Vancouver, Canada (Joint Statistical Meetings 2018)

2019 AUC as a Measure of the Probability of Benefit in the Context of Randomized Controlled Trials / Oral Presentation
Denver, Colorado (Joint Statistical Meetings 2019)

2019 Effects of Marine Omega-3 Supplementation on Fatty Acids and Bioactive Lipids and Associations with Risk of Cardiovascular Disease: Secondary Analysis of the Vital Trial
Philadelphia, Pennsylvania (AHA Scientific Sessions 2019)

2019 Anti-inflammatory HDL Function and Incident Cardiovascular/Death Events: A Secondary Analysis of the JUPITER Trial Boston, Massachusetts (BWH Women in Science Symposium)

2020 WiNN: Drift Correction by White Noise Guided Normalization for Metabolomic Studies that does not Rely on Quality Control Samples
Online (16th International Conference of the Metabolomics Society)

2020 Effects of Omega-3 (n-3) Supplementation on Downstream Fatty Acids (FAs) and Oxylipins and Risk of Cardiovascular Disease: Results of Two Metabolomics Substudies of the Randomized VITamin D and OmegA-3 TriaL
Online (American Heart Association Scientific Meetings)

2020 WiNN: Drift Correction by White Noise Normalization for Metabolomic Studies
Online (Joint Statistical Meetings)

2021 Using Stochastic Orders to Evaluate Performance of Predictive Models: Intransitivity, Area under the ROC and Strength of Stochastic Order Relationships
Online Topic-Contributed Invited Presentation (Joint Statistical Meetings)

2022 Asymptotic properties of AUC under the null in the training-test setting: assessing AUC change for polygenic risk scores and machine learning risk prediction models. (Joint Statistical Meetings)

2022 Glycan biomarkers for cardiovascular events (3rd Meeting of the Human Glycome Project, An International Conference of Glycomics Society. Split, Croatia)

2023 Non-transitivity of Area Under the Receiver Operating Characteristics Curve (Conference of Health Inference and Learning, Boston MA)

2023 AUC estimator for nested matched case-control studies (Joint Statistical Meetings, Toronto Canada)

Report of Technological and Other Scientific Innovations

Implemented novel goodness-of-fit test in survival setting in SAS and R (2015)	SAS and R code are available online at http://ncook.bwh.harvard.edu/r-code.html and in the Appendix of the manuscript which has been published in *Statistics in Medicine* journal (Research Investigation #19)
SARS2: COVID risk score of hospitalization and death	SARS2 model is provided as a web interface for seamless calculation of the risk scores and risk categories. https://dashti.bwh.harvard.edu/sars2/

Report of Scholarship

Peer-reviewed publications in print or other media

Research investigations

1. Wang PS, **Demler OV**, Kessler RC. The adequacy of treatment for serious mental illness in the United States. American Journal of Public Health. Am J Public Health. 2002;92(1):92-98. PMID: 11772769. Cited by 435.

2. Kessler RC, Andrade LH, Bijl RV, Offord DR, **Demler OV**, Stein DJ. The effects of co-morbidity on the onset and persistence of generalized anxiety disorder in the ICPE surveys. International Consortium in Psychiatric Epidemiology. *Psychol Med*. 2002;32(7):1213-1225. PubMed PMID: 12420891. Cited by 79.

3. Kessler RC, Ormel J, **Demler OV**, Stang PE. Comorbid mental disorders account for the role impairment of commonly occurring chronic physical disorders: results from the National Comorbidity Survey. *J Occup Environ Med*. 2003;45(12):1257-1266. PubMed PMID: 14665811. Cited by 291.

4. Kessler RC, Berglund P, **Demler OV**, Jin R, Koretz D, Merikangas KR, Rush AJ, Walters EE, Wang PS. National Comorbidity Survey Replication. The epidemiology of major depressive disorder: results from the National Comorbidity Survey Replication (NCS-R). *JAMA*. 2003 18;289(23):3095-30105. PubMed PMID: 12813115. Cited by 6780.

5. Kessler RC, Berglund P, Chiu WT, **Demler OV**, Heeringa S, Hiripi E, Jin R, Pennell BE, Walters EE, Zaslavsky A, Zheng H. The US National Comorbidity Survey Replication (NCS-R): design and field procedures. *Int J Methods Psychiatr Res*. 2004;13(2):69-92. PubMed PMID: 15297905. Cited by 643.

6. Kessler RC, Abelson J, **Demler OV**, Escobar JI, Gibbon M, Guyer ME, Howes MJ, Jin R, Vega WA, Walters EE, Wang P, Zaslavsky A, Zheng H. Clinical calibration of DSM-IV diagnoses in the World Mental Health (WMH) version of the World Health Organization (WHO) Composite International Diagnostic Interview (WMHCIDI). *Int J Methods Psychiatr Res*. 2004;13(2):122-39. PubMed PMID: 15297907. Cited by 380.

7. Kessler RC, **Demler OV**, Frank RG, Olfson M, Pincus HA, Walters EE, Wang P, Wells KB, Zaslavsky AM. Prevalence and treatment of mental disorders, 1990 to 2003. *N Engl J Med*. 2005

Jun 16;352(24):2515-23. PubMed PMID: 15958807; PubMed Central PMCID: PMC2847367. Cited by 1497.

8. Kessler RC, Chiu WT, **Demler OV**, Merikangas KR, Walters EE. Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the National Comorbidity Survey Replication. *Arch Gen Psychiatry*. 2005;62(6):617-627. PubMed PMID: 15939839; PubMed Central PMCID: PMC2847357. Cited by 9228.

9. Kessler RC, Berglund P, **Demler OV**, Jin R, Merikangas KR, Walters EE. Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. *Arch Gen Psychiatry*. 2005;62(6):593-602. PubMed PMID: 15939837. Cited by 11988

10. Kessler RC, Birnbaum H, **Demler OV**, Falloon IR, Gagnon E, Guyer M, Howes MJ, Kendler KS, Shi L, Walters E, Wu EQ. The prevalence and correlates of nonaffective psychosis in the National Comorbidity Survey Replication (NCS-R). *Biol Psychiatry*. 2005;58(8):668-676. Epub 2005 Jul 14. PubMed PMID: 16023620; PubMed Central PMCID: PMC2847859. Cited by 233.

11. Kessler RC, Adler L, Ames M, **Demler OV**, Faraone S, Hiripi E, Howes MJ, Jin R, Secnik K, Spencer T, Ustun TB, Walters EE. The World Health Organization Adult ADHD Self-Report Scale (ASRS): a short screening scale for use in the general population. *Psychol Med*. 2005;35(2):245-56. PubMed PMID: 15841682. Cited by 1178.

12. Wang PS, **Demler OV**, Olfson M, Pincus HA, Wells KB, Kessler RC. Changing profiles of service sectors used for mental health care in the United States. *Am J Psychiatry*. 2006;163(7):1187-98. PubMed PMID: 16816223; PubMed Central PMCID: PMC1941780. Cited by 280.

13. Kessler RC, Adler L, Barkley R, Biederman J, Conners CK, **Demler OV**, Faraone SV,Greenhill LL, Howes MJ, Secnik K, Spencer T, Ustun TB, Walters EE, Zaslavsky AM. The prevalence and correlates of adult ADHD in the United States: results from the National Comorbidity Survey Replication. *Am J Psychiatry*. 2006;163(4):716-23. PubMed PMID: 16585449; PubMed Central PMCID: PMC2859678. Cited by 2765.

14. **Demler OV**, Pencina MJ, D'Agostino RB Sr. Equivalence of improvement in area under ROC curve and linear discriminant analysis coefficient under assumption of normality. *Stat Med*. 2011;30(12):1410-8. doi: 10.1002/sim.4196. Epub 2011 Feb 21. PubMed PMID: 21337594. Cited by 28.

15. **Demler OV**, Pencina MJ, D'Agostino RB Sr. Misuse of DeLong test to compare AUCs for nested models. *Stat Med*. 2012;31(23):2577-87. doi: 10.1002/sim.5328. Epub 2012 Mar 13. PubMed PMID: 22415937; PubMed Central PMCID: PMC3684152. Cited by 81.

16. Pencina MJ, D'Agostino RB Sr, **Demler OV**. Novel metrics for evaluating improvement in discrimination: net reclassification and integrated discrimination improvement for normal variables and nested models. *Stat Med*. 2012;31(2):101-13. doi: 10.1002/sim.4348. Epub 2011 Dec 7. PubMed PMID: 22147389; PubMed Central PMCID: PMC3341978. Cited by 121.

17. **Demler OV**, Pencina MJ, D'Agostino RB Sr. Impact of correlation on predictive ability of biomarkers. *Stat Med*. 2013;32(24):4196-4210. doi: 10.1002/sim.5824. PubMed PMID: 23640729. Cited by 6.

18. White KT, Moorthy MV, Akinkuolie AO, **Demler OV**, Ridker PM, Cook NR, and Mora S. Identifying an optimal cutpoint for the diagnosis of hypertriglyceridemia in the nonfasting state. *Clinical chemistry* 2015;61(9):1156-63. doi: 10.1373/clinchem.2015.241752. Cited by 11.

19. **Demler OV**, Paynter NP, Cook NR Tests of Calibration and Goodness-of-Fit in the Survival Setting. *Stat Med* 2015 34(10), 1659-1680. doi: 10.1002/sim.6428. Cited by 22.

20. **Demler OV**, Pencina MP, Cook NR, D'Agostino RB Sr. Asymptotic Distribution of ΔAUC, NRIs, and IDI based on Theory of U-statistics. *Stat Med*. 2017 36(21);334-60.

21. Khera AV*, **Demler OV***, Adelman SJ, Collins HL, Glynn RJ, Ridker PM, Rader DJ, Mora S Cholesterol Efflux Capacity, HDL Particle Number, and Incident Cardiovascular Events. *Circulation* 2017;135(25):2494-2504. doi: 10.1161/CIRCULATIONAHA.116.025678. PubMed PMID: 28450350; PubMed Central PMCID: PMC5490983. (*Drs. Khera and Demler contributed equally to this work). Cited by 3.

22. Harada PHN, **Demler OV**, Dugani SB, Akinkuolie AO, Moorthy MV, Ridker PM, Cook NR, Pradhan AD, Mora S. Lipoprotein insulin resistance score and risk of incident diabetes during extended follow-up of 20 years: The Women's Health Study. *J Clin Lipidol*. 2017;11(5), 1257-1267.e2. doi: 10.1016/j.jacl.2017.06.008. PubMed PMID: 28733174; PubMed Central PMCID: PMC5644504.

23. **Demler OV**, Paynter NP, Cook NR. Reclassification calibration test for censored survival data: performance and comparison to goodness-of-fit criteria. Diagnostic and prognostic research. 2018 Dec;2(1):16. doi: 10.1186/s41512-018-0034-5.

24. Tobias DK, Lawler PR, Harada PH, **Demler OV**, Ridker PM, Manson JE, Cheng S, Mora S. Circulating Branched-Chain Amino Acids and Incident Cardiovascular Disease in a Prospective Cohort of US Women. Circulation. Genomic and precision medicine. 2018 April;11(4):e002157. PubMed PMID: 29572205; PubMed Central PMCID: PMC5880282.

25. Farukhi ZM, **Demler OV**, Caulfield MP, Kulkarni K, Wohlgemuth J, Cobble M, Luttmann-Gibson H, Li C, Nelson JR, Cook NR, Buring JE. Comparison of Nonfasting and Fasting Lipoprotein Subfractions and Size in 15,397 Apparently Healthy Individuals: An Analysis from the VITamin D and OmegA-3 TriaL (VITAL). Journal of Clinical Lipidology. 2020 Feb 21.

26. Luttmann-Gibson H, Mora S, Camargo CA, Cook NR, **Demler OV**, Ghoshal A, Wohlgemuth J, Kulkarni K, Larsen J, Prentice J, Cobble M, Bubes V, Li C, Friedenberg G, Lee IM, Buring JE, Manson JE. Serum 25-hydroxyvitamin D in the VITamin D and OmegA-3 TriaL (VITAL): Clinical and demographic characteristics associated with baseline and change with randomized vitamin D treatment. Contemp Clin Trials. 2019 Dec;87:105854. doi: 10.1016/j.cct.2019.105854. Epub 2019 Oct 24. PubMed PMID: 31669447; PubMed Central PMCID: PMC6875603.

27. Enserro DM, **Demler OV**, Pencina MJ, D'Agostino RB Sr. Measures for evaluation of prognostic improvement under multivariate normality for nested and nonnested models. Stat Med. 2019 Sep 10;38(20):3817-3831. doi: 10.1002/sim.8204. Epub 2019 Jun 18. PubMed PMID: 31211443; PubMed Central PMCID: PMC6827341.

28. Antonelli J, Claggett BL, Henglin M, Kim A, Ovsak G, Kim N, Deng K, Rao K, Tyagi O, Watrous JD, Lagerborg KA, Hushcha PV, **Demler OV**, Mora S, Niiranen TJ, Pereira AC, Jain M, Cheng S. Statistical Workflow for Feature Selection in Human Metabolomics Data. Metabolites. 2019 Jul 12;9(7). doi: 10.3390/metabo9070143. Review. PubMed PMID: 31336989; PubMed Central PMCID: PMC6680705.

29. Henglin M, Niiranen T, Watrous JD, Lagerborg KA, Antonelli J, Claggett BL, Demosthenes EJ, von Jeinsen B, **Demler O**, Vasan RS, Larson MG, Jain M, Cheng S. A Single Visualization Technique for Displaying Multiple Metabolite-Phenotype Associations. Metabolites. 2019 Jul

2;9(7). doi: 10.3390/metabo9070128. PubMed PMID: 31269707; PubMed Central PMCID: PMC6680673.

30. Ahmad S, Moorthy MV, **Demler OV**, Hu FB, Ridker PM, Chasman DI, Mora S. Assessment of Risk Factors and Biomarkers Associated With Risk of Cardiovascular Disease Among Women Consuming a Mediterranean Diet. JAMA Netw Open. 2018 Dec 7;1(8):e185708. doi: 10.1001/jamanetworkopen.2018.5708. PubMed PMID: 30646282; PubMed Central PMCID: PMC632432.

31. Kessler RC, Bauer MS, Bishop TM, **Demler OV**, Dobscha SK, Gildea SM, Goulet JL, Karras E, Kreyenbuhl J, Landes SJ, Liu H. Using Administrative Data to Predict Suicide After Psychiatric Hospitalization in the Veterans Health Administration System. Frontiers in Psychiatry. 2020 May 6;11:390.

32. Chasman DI, Giulianini F, **Demler OV**, Udler MS. Pleiotropy-Based Decomposition of Genetic Risk Scores: Association and Interaction Analysis for Type 2 Diabetes and CAD. The American Journal of Human Genetics. 2020 Apr 16.

33. Dashti H, Westler WM, Wedell JR, **Demler OV**, Eghbalnia HR, Markley JL, Mora S. Probabilistic identification of saccharide moieties in biomolecules and their protein complexes. Sci Data. 2020 Jul 3;7(1):210. doi: 10.1038/s41597-020-0547-y. PubMed PMID: 32620933; PubMed Central PMCID: PMC7335193.

34. Sels D, Dashti H, Mora S, **Demler OV**, Demler E. Quantum approximate Bayesian computation for NMR model inference. Nat Mach Intell. 2020 Jul;2(7):396-402. doi: 10.1038/s42256-020-0198-x. Epub 2020 Jul 6. PubMed PMID: 33163858; PubMed Central PMCID: PMC7643990.

35. Ajala ON*, **Demler OV***, Liu Y, Farukhi Z, Adelman SJ, Collins HL, Ridker PM, Rader DJ, Glynn RJ, Mora S. Anti-Inflammatory HDL Function, Incident Cardiovascular Events, and Mortality: A Secondary Analysis of the JUPITER Randomized Clinical Trial. J Am Heart Assoc. 2020 Sep;9(17):e016507. doi: 10.1161/JAHA.119.016507. Epub 2020 Aug 15. PubMed PMID: 32799709; PubMed Central PMCID: PMC7660788.

36. **Demler OV**, Liu, Y, Luttmann-Gibson, H, Watrous, JD, Lagerborg, KA, Dashti, H, ... & Buring, JE., Manson, JE, Cheng, S, Jain M, Mora, S. (2020). One-Year Effects of Omega-3 Treatment on Fatty Acids, Oxylipins, and Related Bioactive Lipids and Their Associations with Clinical Lipid and Inflammatory Biomarkers: Findings from a Substudy of the Vitamin D and Omega-3 Trial (VITAL). Metabolites, 10(11), 431. PMID: 33120862

37. Dashti H, Roche EC, Bates DW, Mora S, **Demler OV**. SARS2 simplified scores to estimate risk of hospitalization and death among patients with COVID-19. Sci Rep. 2021 Mar 2;11(1):4945. doi: 10.1038/s41598-021-84603-0. PMID: 33654180.

38. Dugani SB, Moorthy MV, Li C, **Demler OV**, Alsheikh-Ali AA, Ridker PM, Glynn RJ, Mora S. Association of Lipid, Inflammatory, and Metabolic Biomarkers With Age at Onset for Incident Coronary Heart Disease in Women. JAMA Cardiol. 2021 Apr 1;6(4):437-447. doi: 10.1001/jamacardio.2020.7073. PubMed PMID: 33471027; PubMed Central PMCID: PMC7818181.
39. Kessler RC, Bauer MS, Bishop TM, Bossarte RM, Castro VM, **Demler OV**, Gildea SM, Goulet JL, King AJ, Kennedy CJ, Landes SJ, Liu H, Luedtke A, Mair P, Marx BP, Nock MK, Petukhova MV, Pigeon WR, Sampson NA, Smoller JW, Miller A, Haas G, Benware J, Bradley J, Owen RR, House S, Urosevic S, Weinstock LM. Evaluation of a Model to Target High-risk Psychiatric Inpatients for an Intensive Postdischarge Suicide Prevention Intervention. JAMA Psychiatry. 2023 Mar 1;80(3):230-240. doi: 10.1001/jamapsychiatry.2022.4634. PMID: 36652267

40. Birukov A, Plavša B, Eichelmann F, Kuxhaus O, Hoshi RA, Rudman N, Štambuk T, Trbojević-Akmačić I, Schiborn C, Morze J, Mihelčić M, Cindrić A, Liu Y, **Demler OV**, Perola M, Mora S, Schulze MB, Lauc G, Wittenbecher C. Immunoglobulin G N-Glycosylation Signatures in Incident Type 2 Diabetes and Cardiovascular Disease. Diabetes Care. 2022 Nov 1;45(11):2729-2736. doi: 10.2337/dc22-0833. PMID: 36174116
41. Hoshi RA, Liu Y, Luttmann-Gibson H, Tiwari S, Giulianini F, Andres AM, Watrous JD, Cook NR, Costenbader KH, Okereke OI, Ridker PM, Manson JE, Lee IM, Vinayagamoorthy M, Cheng S, Copeland T, Jain M, Chasman* DI, **Demler* OV**, Mora* S. Association of Physical Activity With Bioactive Lipids and Cardiovascular Events. Circ Res. 2022 Aug 5;131(4):e84-e99. doi: 10.1161/CIRCRESAHA.122.320952. Epub 2022 Jul 19. PMID: 35862024
42. Henglin M, Claggett BL, Antonelli J, Alotaibi M, Magalang GA, Watrous JD, Lagerborg KA, Ovsak G, Musso G, **Demler OV**, Vasan RS, Larson MG, Jain M, Cheng S. Quantitative Comparison of Statistical Methods for Analyzing Human Metabolomics Data. Metabolites. 2022 Jun 4;12(6):519. doi: 10.3390/metabo12060519. PMID: 35736452

Non-peer reviewed scientific or medical publications/materials in print or other media

Reviews, chapters, monographs and editorials

1. Kessler RC, Chiu WT, Colpe L, **Demler OV**, Merikangas KR, Walters EE, Wang PS. The prevalence and correlates of serious mental illness (SMI) in the National Comorbidity Survey Replication (NCS-R). In Manderscheid RW, JT Berry JT (Eds.). Mental Health, United States, 2004. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2006. pp. 134-148.

2. Kessler RC, Berglund PA, Chiu W-T, **Demler OV**, Glantz M, Lane MC, Jin R, Merikangas KR, Nock M, Olfson M, Pincus,HA, Walters EE, Wang PS, Wells KB. The National Comorbidity Survey Replication (NCS-R): Cornerstone in improving mental health and mental health care in the United States. In Kessler RC, Üstün TB (Eds.). The WHO World Mental Health Surveys: Global Perspectives on the Epidemiology of Mental Disorders. New York: Cambridge University Press; 2008. pp. 165-209.

3. Dashti HT, Bates D, Fiskio JM, Roche EC, Mora S, **Demler OV**. Clinical Characteristics and Severity of COVID-19 Disease in Patients from Boston Area Hospitals. medRxiv. 2020 Aug 4;. doi: 10.1101/2020.07.27.20163071. PubMed PMID: 32793930; PubMed Central PMCID: PMC7418757.

Letters to the Editor

1. Cook NR, **Demler OV**, Paynter NP. Clinical Risk Reclassification at 10 Years. *Stat Med*. 2017; Dec 10;36(28):4498-502.
   .

Thesis

Demler OV. Impact of New Variables on Discrimination of Risk Prediction Models [dissertation]. Boston (MA): Boston University; 2012.

Narrative Report

I serve as a biostatistician with dual affiliations. I have a permanent position as a Senior Scientist at the Swiss Federal Institute of Technology (ETH Zurich) and a tenure-track appointment as an Assistant Professor at the Division of Preventive Medicine at Brigham and Women's Hospital/Harvard Medical School in Boston, USA. This combination allows me to foster collaborations between my Boston-based

colleagues who are renown experts in clinical cardiovascular research with my collaborators from Zurich who are part of one of the world's top-ten computer science department. My academic pursuits center around several key areas: advancing statistical methodologies for risk prediction, tackling statistical complexities in biomarker discovery studies encompassing metabolomics and other large omics datasets, and training diagnostic models using medical imaging and Electronic Health Records data. Clinical focus of my research centers on understanding the mechanisms underlying the onset and progression of cardiovascular diseases.

In risk prediction, my focus centers on studying the properties of the widely used measure of discrimination known as Area Under Receiver Operating Characteristics Curve (AUC or c-statistic) and the development of novel goodness-of-fit and calibration tests tailored for survival settings. Recently my research has delved into the investigation of non-transitive properties of AUC and win ratio, both of which are fundamental statistics extensively employed in clinical research and machine learning applications. I lead projects on training in large electronic health records data and UK Biobank fully interpretable machine learning models that retain causal disease mechanisms. My research in biomarker discovery is centered on all phases of conventional, NMR, LCMS, and LCMS2 metabolomic studies. The overarching objective is to facilitate the discovery of novel disease mechanisms, potential drug targets and intervention strategies. My work includes the development of rigorous analytical pipelines for the analysis for metabolomics data analysis, including robust quality control procedures, signal correction, and subsequent statistical analysis of metabolomic datasets.

I have served as a Principal Investigator for several grants funded by the National Institutes of Health, the American Heart Association and the Swiss Data Science Center. Additionally, I provide statistical leadership in the analysis of randomized clinical trials and observational studies, including the Framingham Heart Study, Women’s Health Study, JUPITER trial, and the VITAminD and OmegA-3 Trial (VITAL). I was providing statistical expertise for Data Safety Monitoring Board (DSMB) for PROMINENT trial a large multi-center clinical trial.

I have had the privilege of teaching several introductory and advanced courses on Machine Learning in Medical Research for medical professionals at Tufts University and Brigham and Women’s Hospital, Boston, USA. In the Fall of 2023, I will be teaching a graduate seminar course at the computer science department at ETH. In the spring of 2024, I am scheduled to teach “Introduction to Machine Learning and Risk Prediction”, a graduate course at Harvard TH Chan School of Public Health.