Roberta De Vito, PhD

CONTACT INFORMATION	Department of Biostatistics Brown University 121 S. Main Street, Providence, RI	☎: +1-857-205-4343 ✉: roberta_devito@brown.edu 🌐: rdevito.github.io

EDUCATION & TRAINING	**Harvard T.H. Chan School of Public Health**, Boston, USA *Ph.D. Visiting Research Scholar* Advisor: Prof. Giovanni Parmigiani	2014 - 2016
	University of Padua, Padova, Italy *Ph.D. in Statistical Science* Co-Advisors: Prof. Giovanni Parmigiani and Prof. Ruggero Bellio	2013 - 2016
	University La Sapienza, Rome, Italy *M.S. in Statistical Science* 110/110 cum laude Advisors: Prof. Giovanni Parmigiani and Prof. Ludovico Piccinato	2009- 2012
	Dana-Farber Cancer Institute and Harvard T.H. Chan School of Public Health *Visiting Scholar* during MSc thesis Advisor: Prof. Giovanni Parmigiani	2011
	University La Sapienza, Rome, Italy *B.S. in Statistics* 110/110 Advisor: Prof. Marco Perone Pacifico	2005- 2008

ACADEMIC EXPERIENCE	**Brown University**, Providence, USA *Assistant Professor* Department of Biostatistics and Data Science Initiative	January 2020 - Present
	Princeton University, Princeton, USA *Postdoctoral Research Fellow* Department of Computer Science	July 2016 - August 2019
	Harvard T.H. Chan School of Public Health and Dana-Farber Cancer Institute February 2016 - June 2016 *Research Assistant* Department of Biostatistics and Computational Biology.	

HONORS & AWARDS	W. J. Youden Award in Interlaboratory Testing	**2022**
	IBS-IR Inter-Region and Network Funding Award	**2019**
	IBS-IR Inter-Region and Network Funding Award	**2019**
	ISBA World Meeting Travel Award	**2018**
	BNP-ISBA Travel Award	**2017**
	Women in Machine learning (WiML) Travel grant	**2016**
	Best Poster Award, Reproducibility in Personalized Medicine Research	**2016**
	ISBA Travel Award	**2016**
	Research Fellowship and Award for Study and Research Abroad	**2014-2015**
	MSc Thesis Award - research at Harvard T.H. Chan School of Public Health	**2011**
	Study Fellowship, Università di Roma - Sapienza	**2010-2011**
	Erasmus Fellowship, Southampton University, UK	**2008**

PUBLICATIONS   **Refereed Journals**

1. Cabral-Marquesa O., Marquesa A., Giil L., **De Vito R.**, Rademacherf J., Ganther J., Lange T., Humrich J. Y., Klapa S., Schinke S., Schimkea L.F., Marschner G., Pitann S., Mastroianni J., Adler S., Dechend R., Moller D., Braicu I., Sehouli J., Schulze-Forster K., Trippelm T., Scheibenbogen C., Staff A., Mertens P.R., Lobelr M., Dragun D., Engelhardt B. E., Fernandez-Cabezudo M.J., Ochs H.D., al-Ramadi B.K., Lamprecht P., Mueller A., Heidecke H., Riemekasten G. (2018) **Network-based analysis reveals signatures of IgG autoantibodies targeting G protein-coupled receptors in healthy and diseases,** *Nature Communications*, 9(1): 5224-5238.

2. **De Vito R.**, Bellio R., Trippa L., and Parmigiani G. (2019) **Multi-study Factor Analysis,** *Biometrics*, 75(1): 337-346 .

   arXiv reference: 1611.06350. With **R package**.

3. **De Vito R.**, Lee Y. C. A., Parpinel M., Serraino D., Olshan A. F., Zevallos J. P., Zhang Z. F., Morgenstern H., Levi F., Kelsey K., McClean M., Bosetti C., Schantz S., Yu G. P., Boffetta P., Chuang S. C., Hashibe M., La Vecchia C., Parmigiani G., and Edefonti V. (2019) **Shared and study-specific dietary patterns and head and neck cancer risk in an international consortium,** *Epidemiology*, 30(1): 93-102.

4. Edefonti V., **De Vito R.**, Dalmartella M., Patel L., Salvatori A., and Ferraroni M. (2020) **Reproducibility and Validity of a Posteriori Dietary Patterns: a Systematic Review,** *Advances in Nutrition*, 11(2): 293-326.

5. Edefonti V., **De Vito R.**, Dalmartella M., and Ferraroni M. (2020) **Reproducibility of a posteriori dietary patterns across time and studies a systematic review,** *Advances in Nutrition*, 11(5), 1255-1281.

6. **De Vito R.**, Bellio R., Trippa L., and Parmigiani G. **Bayesian Multi-study Factor Analysis for High-throughput Biological Data,** *Annal of Applied Statistics*, 15 (4), 1723-1741.

   arXiv reference: 1806.09896. With **R package**.

7. Avalos-Pacheco A., **De Vito R.**, and Wade S. (2021) **Discussion of "Centered Partition Processes: Informative Priors for Clustering" by Paganin et al.,** *Bayesian Analysis*, 1(1), 1-32.

8. Salgado R.C., Fonseca D.L.M., Marques A.H.C., Napoleao S.M., Franca T.T., Akashi K.T., Prado C.A.S., Baiocchi G.C., Placa D.R., Jansen-Marques G., Filgueiras I.S., **De Vito R.**, et al. (2022) **The network interplay of interferon and toll-like receptor signaling pathways in the anti-Candida immune response,** *Scientific Reports*, 11 (1), 1-17.

9. Sotzny F., Filgueiras I.S., Kedor C., Freitag H., Kirsten W., Bauer S.M., Sepulveda N., da Fonseca D.L.M, Baiocchi G.C., Marques A.H.C., Kim M., Lange T., Placa D.R, Luebber F., Paulus F.M., **De Vito R.**, et al. (2022) Dysregulated autoantibodies targeting vaso- and immunoregulatory receptors in Post COVID Syndrome correlate with symptom severity, *Frontiers Immunology*, accepted.

10. Grabsky I. N., **De Vito R.**, Trippa L., and Parmigiani G. (2022) **Bayesian Combinatorial Multi-Study Factor Analysis,** *Annal of Applied Statistics*, accepted.

    arXiv reference: 2007.12616.

11. Shutta K.H., **Roberta De Vito**, Denise M. Scholtens D.M., Balasubramanian R. (2022) Gaussian Graphical Models with Applications to Omics Analyses, *Statistics in Medicine*.

12. Lewis N., Chambers L.C., Chu H.T., Fortnam, T., **De Vito R.**, Gargano L.M., Chan P.A., McDonald J., Hogan J.W. (2022) **Effectiveness Associated With Vaccination After COVID-19 Recovery in Preventing Reinfection,** *JAMA Network Open*, 5 (7), 1-11.

13. Vistica-Sampino E., Morgan J., Chorzalska A., Nguyen L., Rodriguez A., Bonal D., Kim M., **De Vito R.**, Lulla R., Dubielecka P. (2022) **Comparative flow cytometry-based immunophenotyping analysis of peripheral blood leukocytes before and after fixation with paraformaldehyde,** *Journal of Immunological Methods*, accepted

14. Chambers L.C., Chu H.T., Lewis N., Kamat G., Fortnam T., **De Vito R.**, Chan P.A., Lasher L., McDonald J., Alexander-Scott N., Hogan J.W. **Effectiveness of Monoclonal Antibody Therapy for Preventing COVID-19 Hospitalization and Mortality in a Statewide Population**. *Rhode Island Medical Journal*, accepted

Preprints in review

1. Grabsky I. N., **De Vito R.**, and Engelhardt B. E. **Bayesian Ordinal Quantile Regression with a Partially Collapsed Gibbs Sampler,** submitted.

   arXiv reference: 1911.07099. With **R package**.

2. **De Vito R.**, Dumitrascu B., Grabsky I. N.(* co-first authors), and Engelhardt B. E. **A statistical framework for the joint identification of common and specific patterns of genetic regulation in multi-tissue studies,** submitted.

3. **De Vito R.**, Grabsky I. N. (* co-first authors), et al. **Differentially methylated regions and methylation QTLs for teen depression and early puberty in the Fragile Families Child Wellbeing Study,** submitted.

   bioRxiv: 2021.05.20.444959

4. **De Vito R.** et al., **Shared and ethnic background site-specific dietary patterns in Hispanics/Latinos: the Hispanic Community Health Study/Study of Latinos (HCHS/SOL),** submitted

   medRxiv: 2022.06.30.22277013

5. **De Vito R.**, Menzio M., Lacqua P., Castellari S., Colognese A., Collatuzzo G., Russignaga D., Boffetta P., **Determinants of COVID-19 Infection among Employees of an Italian Financial Institution,** submitted

6. Shutta K. H., Gill N., Scholtens D.M., , Balasubramanian R. **De Vito R.***, (* corresponding author) **Estimating Gaussian graphical models of multi-study data with Multi-study Factor Analysis**

   arXiv: 2210.12837

Conference proceedings

1. Ingegnoli F., De Vito R., Caporali R., Parpinel M., Grosso G., Ferraroni M., Edefonti V.(2022) **AB0286 Beneficial effect of olives and olive oil consumption on rheumatoid arthritis disease activity,** *Annals of the Rheumatic Diseases*, 81: 1269-1270.

2. Chan K.H. K., Liu Q., Reiner A.P., Roberta De Vito R., et al. (2022) **Identification Of Genetic Signals For" Diabesity"-Type 2 Diabetes And Obesity-Among African American And European American Participants In Four Cohorts Of The TOPMed Consortium,** *Circulation*, 145: 1218.

3. Cabral-Marques O., Marques A., **De Vito R.**, Gill L.M., J Rademacher J., Gunther J., Marschner G., Pitann S., Adler S., Dragun D., Lamprecht P., Muller A., Yu X., Petersen , Heidecke H., Engelhardt B.E., Riemekasten G. (2018) **A physiological network of igg autoantibodies targeting g protein coupled receptors,** *Annals of the Rheumatic Diseases*, 77(2): 1218.

4. **De Vito R.**, La Vecchia C., Parmigiani G., and Edefonti V. (2018) **Shared and Study-Specific Dietary Patterns: a Novel Approach to Replicability and Validity,** *JSM Proceedings: American Statistical Association.*

5. Cabral-Marques O., Marques A., Gill L.M., **De Vito R.**, Engelhadrd B.E., Sehouli J., Heidecke H., Riemekasten G. (2018) **Network-based analysis reveals signatures of IgG autoantibodies targeting G protein-coupled receptors in health and disease,** *Advances in RAB Research 1(1).*

6. **De Vito R.**, Engelhardt B. E (2019) A meta-tissue non-parametric factor analysis model for gene co-expression, *Book of Short Papers SIS2019.*

7. Cabral-Marques O., Marques A., Gill L.M., **De Vito R.**, Engelhadrd B.E., Sehouli J., Heidecke. H., Riemekasten G. (2019) Network-based analysis reveals signatures of IgG autoantibodies targeting G protein-coupled receptors in healthy and diseases, *European Journal of Immunology*, 49(1): 214-215.

Papers in progress

1. **De Vito R.**, Grabsky I. N., and Engelhardt B. E. Paired probit copula regression.

2. **De Vito R.**, Dumitrascu B.(* co-first authors), and Engelhardt B. E. Multi-study nonparametric factor analysis.

3. **De Vito R.**, Stephenson B.(* co-first authors), Edefonti V., and Sotres-Alavarez D. Dietary patterns derived using Bayesian Multi-Study Factor Analysis: results from HCHS/SOL.

4. Grabsky I. N., **De Vito R.**, Trippa L., and Parmigiani G. Non-Negative Matrix Factorization in Multi-Study Factor Analysis.

5. **De Vito R.**, and Edefonti V. Multi study analysis to derive shared and study-specific dietary patterns in the United States.

6. Siff E., Ghazal A., Michelow I., **De Vito R.** COVID-19 Survival: What are the Driving Forces? An Unsupervised Machine Learning Approach

SOFTWARE   **MSFA** R package to fit the multi-study factor model and the Bayesian multi-study factor model (author, maintaner)

ACTIVE &
PENDING GRANTS

NIGMS/NIH COBRE CBHD P20GM109035 (PI: Roberta De Vito) NIGMS Title: Recovering reproducible and local signal in genomic data Role: Project Principal Investigator	12/2022 – 12/2024
R25 AI140490 (Multiple PI) NIH/NIAID Title: Emerging Infectious Disease Scholars at Brown University Role: Co-Investigator	08/2020 – 07/2023
CARES ACT (PI Joseph Hogan) Rhode Island Department of Health Title: Assistantship and Faculty Service- CARES ACT Role: Co-Investigator	07/2021- 06/2022
R01 CA262710-01 (PI Giovanni Parmigiani) NIH Title: Statistical Methods for Cancer Mutational Signatures Role: Co-Investigator	07/2021– 06/2026
R01 00031746 (PI: Raji Balasubramanian) NIH Title: Integrative Models for Molecular Epidemiology Role: Co-Investigator	Pending
RFA-CA-20-049 (PI: Paolo Boffetta)	Pending

NIH
Title: Environmental Cancer Epidemiology in Long Island (ECELI) Cohort
Role: Co-Investigator

R01 (PI: Simin Liu)   Pending
NIH
Title: The Role of Sex Hormones in Stroke Risk: A Sex-Specific Integrative Omics Analysis in the
NHLBI Trans-Omics for Precision Medicine Cohorts
Role: Co-Investigator

R01 (PI: Simin Liu)   Pending
NIH
Title: The Role of Sex Hormones in Stroke Risk: A Sex-Specific Integrative Omics Analysis in the
NHLBI Trans-Omics for Precision Medicine Cohorts
Role: Co-Investigator

SERVICE TO
PROFESSION

Positions in Scientific Societies

Chair-Elect of the J-ISBA Section. International Society for Bayesian Analysis   **2020-2022**

Referee Service

Annals of Applied Statistics; Biometrics; Computational Statistics & Data Analysis; IEEE BIBM19;
Journal of the American Statistical Association; Journal of Machine Learning Research; Statistics
in Medicine; JRSS series C

Organization of Scientific Events

- Member of the scientific committee and primary organizer, BAYSM 2022, **BAYSM 2022**, 2022
- Member of the scientific committee, BAYSM 2021, **BAYSM 2021**, 2021
- Member of the organizing committee, 2021 ISBA World meeting, **2021 Isba world meeting**, 2021
- Member of the scientific and organizing committee, O-BAYSM Conference, **Bayesian Young Statisticians Meeting: Online**, 2020
- Member of the scientific and organizing committee for **Virtual Student Research Symposium on Statistics and Data Science**
- Member of the scientific and organizing committee for **Webinar series, Junior Bayes Beyond the Borders (JB^3)**
- Organizer, J-ISBA Section on **Junior Research in Methods for Integrating Heterogeneous Data: From Clustering to Factor Analysis**, JSM 2020
- Member of the program committee for **2019 IEEE International Conference on Bioinformatics and Biomedicine (BIBM 2019)**
- Member of the program committee for the **BNP@NeurIPS 2018**
- Organizer, J-ISBA Section on **Junior Research in Bayesian nonparametric modeling of complex or unknown populations**, JSM 2018
- Chair, J-ISBA Section on **Junior Research in Bayesian nonparametric modeling of complex or unknown populations**, JSM 2018
- Chair, Biometrics Section on **Statistics in Genomics and Genetics**, JSM 2017
- Joint organizer, **Princeton Bayesian Nonparametric Workshop**, Princeton University, 30 May - 1 June, 2017

Scientific Review Groups, Expert Panels, and Consensus Committees
- Panel reviewer, NSF, Neuro-like Systems Panel, 2021

MENTORSHIP
ACTIVITIES

Post-doctoral fellows
- Myungjin Kim, Professor, Department of Statistics, Kyungpook National University   2020-2021

Doctoral Students

- Blake Hansen (Department of Biostatistics, Brown University)   2019-Present
- Taylor Fortnam (Department of Biostatistics, Brown University)   2019-Present
  co-supervised with Joseph W Hogan
- Katherine Shutta (Postdoc, Department of Biostatistics, Harvard University)   2019-2021

Doctoral Dissertation Committees

- Dana Udwin (Department of Biostatistics, Brown University)   Present
  Advisor: Lorin Crawford
- Kexin Qu (Department of Biostatistics, Brown University)   Present
  Advisor: Christopher H. Schmid
- Xiaoyu Wei (Department of Biostatistics, Brown University)   Present
  Advisor: Zhijin J Wu

Masters Students

Youn Kyeong Chang (Data Science Initiative, Brown University), 2022; Yutong Li (Department of Biostatistics, Brown University), 2022; Xiao Liu (Department of Biostatistics, Brown University), 2021-2022; Lee Hyunjoon (Data Science Initiative, Brown University), 2021;

Master's Committee

Chang Yu (Department of Biostatistics, Brown University), 2021

Undergraduate Thesis Advising

Isabel Grabsky (Computer Science, Princeton University), 2019; Alexandra Burgess (School of Public Health, Brown University), 2021-2022

K99 Advisees

Brie M Reid, Brown University   2022-2027
NICHD/NIH
Title: Machine learning methods to assess risk for prenatal and neonatal iron deficiency anemia from maternal stress exposure

TEACHING
EXPERIENCE

Teaching

- Foundations of Probabilistic Modeling, Factor analysis, Princeton University, [COS 513] (Fall 2017)
- Statistical Learning, Brown University [DATA2020] (Spring 2020, 2021, 2023)
- Fundamentals of Probability and Statistical Inference, Brown University [PHP2515] (Fall 2020)
- Introduction to Statistical Analysis of Data, IMSD Program, Brown University (Fall 2020)
- Linear Models, Brown University [PHP2601] (Fall 2021, 2022)

ORAL
PRESENTATIONS

- Bayesian cross-study models: from epidemiological to to genomics applications, CM-Statistics 2022 (invited talk)
- Bayesian multi-study model: adventures from epidemiology to genomics, International Conference on Statistics and Data Science (ICSD) 2022 (invited talk)
- Multi-study approaches: adventures from nutrition to genomics, Seminar at University of Rhode Island 2022 (invited talk)
- Bayesian cross-study factor regression approach, JSM 2022 (invited talk)
- Bayesian Multi-study Factor Analysis for nutritional data, New England Statistics Symposium (NESS) 2022 (invited talk)
- Reproducibility for high-dimensional genomic data , NE-Tripods Event 2022 (invited talk)
- Bayesian Multi-Study Factor Analysis for High-Dimensional Epidemiological Data, ICSDS22 2022 (invited talk)
- Multi-Study Approaches for Assessing Reproducibility, McGill Biostatistics Seminar, 2022 (invited talk)
- Assessing biological and epidemiological Cross-Study Reproducibility via machine learning techniques, 34th New England Statistics Symposium, 2021 (invited talk)

- **Multi-study machine learning approaches for assessing reproducibility**, MATH UH DES, 2021, (invited talk)
- **Cross-Study machine learning techniques: Reproducibility and differences across studies**, Machine Learning Series, Advance-CTR Bioinformatics, 2021, (invited talk)
- **Quantile Probit Copula Model for association in paired study data**, JSM, 2021, (invited talk)
- **Approaches to Assessing Intake of Food and Dietary Supplements in Pregnant Women and Children 2 to 11 Years of Age: Webinar Series**, The National Academies of Science Engineering Medicine (invited speaker in a panelist session)
- **Bayesian Multi-study Factor Analysis**, ENAR, 2021, (invited talk)
- **Bayesian Multi-study in the HCHS/SOL project**, HCHS/SOL Stats, 2020, (invited talk)
- **Multy-study Factor Analysis in the US diet INHANCE Consortium**, 17th INHANCE meeting, 2020, (invited talk)
- **Quantile Probit Copula Model for the Joint Modeling of Correlated Binary Outcomes**, JSM 2020, 2020, (contributed talk)
- **Reproducibility in the Big-Data Era**, Inaugural DSI Faculty for Faculty Research Talk, 2020, (invited talk)
- **Multi-study factor analysis for biological data**, Università di Roma - Sapienza, 2019, (invited talk)
- **A meta-tissue non-parametric factor analysis model for gene co-expression**, SIS 2019 - Smart Statistics for Smart Applications, (invited talk)
- **Multi-study Factor Analysis, Bayesian and Likelihood-based Approaches**, 12th IBS-Italian Region conference XII conferenza della Societa Italiana di Biometria (SIB), (invited talk)
- **Shared and Study-Specific Dietary Patterns**, JSM 2018 (contributed talk)
- **Bayesian Multi-Study Factor Analysis**, 2018 ISBA World Meeting (invited talk)
- **Bayesian Multi-Study Factor Analysis in High-Dimensional Biological Data**, JSM 2017 (invited talk)
- **Bayesian nonparametric multi-study factor analysis**, BNP 11 Paris 2017 (contributed talk)
- Shared and Study-Specific Dietary Patterns and their association with head and neck cancer risk in an international consortium, Mount Sinai, 2017 (seminar)
- A novel approach to external reproducibility and validity of dietary patterns, 14th INHANCE Annual Meeting, 2017 (invited talk)
- **Multi-study factor analysis model, with applications in genomics and epidemiology**, Università degli studi di Milano, 2016 (invited talk)
- **Multi-study factor model in dietary pattern analysis**, NIPS, 2016 (poster)
- Indian Buffet process in factor analysis, WiML2016 (poster)
- Bayesian Multi-study Factor Analysis with genomic application, 2016 ISBA World Meeting (poster)
- Latent variables models for big data analysis, Princeton Neuroscience Institute Meeting, Princeton University, 2016 (invited talk)
- Joint Factor Analysis in High Dimensional Biological Data, Computer Science, Princeton University, 2015 (invited talk)
- Cross-study analysis for Biological Data, Genomic Meeting, Department of Biostatistic and Computational Biology Department, Dana Farber Cancer Institute, 2015 (contributed talk)
- Joint analysis in High Dimensional Data, University of Padua, 2015 (seminar)

Service to Brown University Department of Biostatistics	• Meiklejohns advisors to the incoming Class of 2026 • Member of the Intro Course Committee, 2022-present • Member of the Faculty Admissions Committee for the new Online MPH Program, 2022-present • Member of the Biostats Academic Program Committee, 2021-2022 • Member of the PhD Admissions Committee, 2021-2022 • Organizer of Biostatistics Seminar, 2021-present • Abstract Reviewers for the Public Health Research Day, 2021
Service to Brown University Data Science Initiative	• Member of the DSI Postdoctoral fellow search committee, 2022-present • Member of the DSI Executive Committee, 2021-present • Member, Tenure-track faculty search committee, 2021, 2023 • Member of the DSI Master Admissions Committee, 2023
Extra-Academic Experience	• On-Call Statistician, Engineers Without Borders, USA • Press Assistant at the Swatch FIVB Word Tour Open 2010, Italy • Active member of Legambiente, Italy

Boston, MA, January 18, 2023