

Biographical Sketch

Dr. Lori Morton is Senior Vice President, Research at Regeneron Pharmaceuticals. She leads Cardiovascular and Renal Research at Regeneron. In that role, Dr. Morton leads a team of scientists in the discovery and validation of new targets for the treatment of a wide variety of diseases affecting heart, kidney, lung and vascular function, as well as diseases characterized by fibrosis.

Dr. Morton has a Bachelor of Arts degree in Biological Sciences from Douglass College of Rutgers University and a Ph.D. in Genetics and Molecular Biology from the University of North Carolina at Chapel Hill. Dr. Morton's graduate research involved the use of genetic modification in mice to explore the biology of the breast cancer gene, BRCA1. Following her Ph.D., Dr. Morton was a post-doctoral fellow at Pfizer Pharmaceuticals, characterizing genetically modified mice deficient in the OF45 gene, a protein involved in determination of bone density. As a Pfizer fellow, Dr. Morton then transferred to Memorial Sloan Kettering Cancer Center, where she studied co-activators of nuclear receptor (Vitamin D, TSH, Estrogen, etc.) transcription. In 2002, Dr. Morton joined Regeneron Pharmaceuticals in the Neuroendocrinology and Obesity Research group, and initiated cardiovascular studies to better understand the function of a number of genes and proteins on blood pressure, cardiac and renal function. From this beginning, Dr. Morton built the present Cardiovascular and Renal Research group.

The team's work is largely inspired by human genetics and genetic influences on disease risk, human disease gene expression and biomarkers, and pharmacology in preclinical models of disease, as well as deep understanding of normal and disease physiology, cell biology and signaling. After identifying promising targets for disease treatment, Dr. Morton's group collaborates with several technology core groups at Regeneron to develop and test new drugs, establish preclinical proof of concept, select the best drug candidates for new clinical programs and providing scientific leadership throughout clinical development. Dr. Morton's team has been a robust contributor to Regeneron's portfolio of innovative new drugs currently in clinical development, including agonist and antagonist therapeutic antibodies, siRNA therapeutics and CrispR gene therapy. Recent successes include the approval of Veopoz™ for the treatment of CHAPEL disease, exciting Ph 3 results with Pozelimab/Cemdiseran in both Paroxysmal Nocturnal Hematuria and Myasthenia Gravis, exciting Ph 2 results using F11 inhibitors for prevention of venous thromboembolism following orthopedic surgery, and blood pressure lowering with NPR1 agonism in Ph 1 studies.

Dr. Morton is a key culture leader at Regeneron, a leading voice in reinforcing the "Regeneron Way" for the global Regeneron community, most especially recognizing the opportunity for "Doing Well by Doing Good" not only through the development of novel treatments for diseases, but through improving the lives of our colleagues by providing a fulfilling and supportive place to work. Dr. Morton has extended her reach through robust community engagement in Westchester County, NY and has been recognized for her volunteerism, commitment to STEM education and public service.

Research Interests

Currently leads a 40-member team of scientists engaged in target discovery, target validation and biologics drug development in the areas of acute and chronic kidney disease, cardiac injury and failure, complement dysregulation, systemic and pulmonary hypertension, coagulation, pulmonary, liver, renal, cardiac, and skin fibrosis.

Education

Ph.D., Genetics and Molecular Biology 1999

University of North Carolina at Chapel Hill, Chapel Hill, NC.

Dissertation title: The role of the tumor suppressor *Brca1* in murine development, cell growth and tumorigenesis. Thesis advisor: Beverly H. Koller, Ph.D.

B.A., Biology 1993

Douglass College of Rutgers University, New Brunswick, NJ

Experience

- Senior Vice President, Research, **Regeneron Pharmaceuticals** 2023-present
- Vice President, Research, **Regeneron Pharmaceuticals** 2019-2022
- Senior Director, Cardiovascular & Renal Research, Fibrosis Research, **Regeneron Pharmaceuticals** 2018-2019
- Director, Cardiovascular and Renal Research, Fibrosis Research, **Regeneron Pharmaceuticals** 2015-2017
- Associate Director, Cardiovascular & Renal Research, Fibrosis Research, **Regeneron Pharmaceuticals** 2012-2015
- Sr. Staff Scientist, Cardiovascular & Renal Research, **Regeneron Pharmaceuticals** 2008-2011
- Staff Scientist, Cardiovascular & Renal Research, **Regeneron Pharmaceuticals** 2006-2008
- Staff Scientist, Neuroendocrinology & Obesity, **Regeneron Pharmaceuticals** 2005-2006
- Scientist, Neuroendocrinology and Obesity, **Regeneron Pharmaceuticals** 2002-2005
- Research Fellow, Department of Cell Biology, Sloan-Kettering Institute, **Memorial Sloan Kettering Cancer Center**, New York, NY. *Laboratory of Leonard P. Freedman, Ph.D.* 2000-2002
- Research Fellow, Department of Cardiovascular and Metabolic Diseases, **Pfizer, Inc.** Groton, CT. *Laboratory of Thomas A. Brown, Ph.D.* 1999-2000

Publications

Thomas M, Frleta D, Lai K, O'Brien J, Patel A, Zhao Y, Koblyarz K, Tu N, Halasz G, Guo C, Macdonald L, **Morton L**, Chalothorn D, Devalaraja-Narashimha K. *Interplay of Pro-Coagulatory and Neutrophil-derived Anti-coagulatory proteins in C1q-NET driven Blood Coagulation* **Blood**. 2025 *In press*.

Albert Henry, Xiaodong Mo, Chris Finan, Mark D. Chaffin, Doug Speed, Hanane Issa, Spiros Denaxas, James S. Ware, Sean L. Zheng, Anders Malarstig, Jasmine Gratton, Isabelle Bond, Carolina Roselli, David Miller, Sandesh Chopade, A. Floriaan Schmidt, Erik Abner, Lance Adams, Charlotte Andersson, Krishna G. Aragam, Johan Ärnlöv, Geraldine Asselin, Anna Axelsson Raja, Joshua D. Backman, Genes & Health Research Team, Estonian Biobank Research Team, DBDS Genomic Consortium, HERMES Consortium. Genome-wide association study meta-analysis provides insights into the etiology of heart failure and its subtypes. **Nat Genet**. 2025 Apr;57(4):815-828. doi: 10.1038/s41588-024-02064-3.

Sean L. Zheng, Albert Henry, Douglas Cannie, Michael Lee, David Miller, Kathryn A. McGurk, Isabelle Bond, Xiao Xu, Hanane Issa, Catherine Francis, Antonio De Marvao, Pantazis I. Theotokis, Rachel J. Buchan, Doug Speed, Erik Abner, Lance Adams, Krishna G. Aragam, Johan Ärnlöv, Anna Axelsson Raja, Joshua D. Backman, John Baksi, Paul J. R. Barton, Kiran J. Biddinger, Eric Boersma, COVIDsortium, DBDS Genomic Consortium, Estonian Biobank Research Team, HERMES Consortium, ...R. Thomas Lumbers. Genome-wide association analysis provides insights into the molecular etiology of dilated cardiomyopathy. **Nat Genet**. 2024 Dec;56(12):2646-2658. doi: 10.1038/s41588-024-01952-y.

Dunn ME, Kithcart A, Kim JH, Ho AJ, Franklin MC, Romero Hernandez A, de Hoon J, Botermans W, Meyer J, Jin X, Zhang D, Torello J, Jasewicz D, Kamat V, Garnova E, Liu N, Rosconi M, Pan H, Karnik S, Burczynski ME, Zheng W, Rafique A, Nielsen JB, De T, Verweij N, Pandit A, Locke A, Chalasani N, Melander O, Schwantes-An TH; Penn Medicine Biobank; Baras A, Lotta LA, Musser BJ, Mastaitis J, Devalaraja-Narashimha KB, Rankin AJ, Huang T, Herman G, Olson W, Murphy AJ, Yancopoulos GD, Olenchock BA, **Morton L**. Agonist antibody to guanylate cyclase receptor NPR1 regulates vascular tone. **Nature**. 2024 Sep;633(8030):654-661. doi: 10.1038/s41586-024-07903-1.

Abedini A, Levinsohn J, Klötzer KA, Dumoulin B, Ma Z, Frederick J, Dhillon P, Balzer MS, Shrestha R, Liu H, Vitale S, Bergeson AM, Devalaraja-Narashimha K, Grandi P, Bhattacharyya T, Hu E, Pullen SS, Boustany-Kari CM, Guarnieri P, Karihaloo A, Traum D, Yan H, Coleman K, Palmer M, Sarov-Blat L, **Morton L**, Hunter CA, Kaestner KH, Li M, Susztak K. Single-cell multi-omic and spatial profiling of human kidneys implicates the fibrotic microenvironment in kidney disease progression. **Nat Genet**. 2024 Aug;56(8):1712-1724. doi: 10.1038/s41588-024-01802-x.

Patel SM, Lopes MS, Morrow DA, Bellavia A, Bhatt AS, Butler KK, D'Antonio J, Dunn M, Fagundes AA Jr, Jarolim P, Marin EP, **Morton L**, Olenchock BO, Senman B, da Silva DS, Varshney AS, Bohula EA, Berg DD. Targeted proteomic profiling of cardiogenic shock in the cardiac intensive care unit. **Eur Heart J Acute Cardiovasc Care**. 2024 Aug 28;13(8):624-628. doi: 10.1093/ehjacc/zuae068.

Zhu YO, MacDonnell S, Kaplan T, Liu C, Ali Y, Rangel SM, Wipperman MF, Belback M, Sun DS, Ren Z, Zhou XA, Halasz G, **Morton L**, Kundu RV. Defining a Unique Gene Expression Profile in Mature and Developing Keloids. **JID Innov**. 2023 May 19;3(5):100211. doi: 10.1016/j.xjidi.2023.100211.

Devalaraja-Narashimha K, Ehmann PJ, Huang C, Ruan Q, Wipperman MF, Kaplan T, Liu C, Afolayan S, Glass DJ, Mellis S, Yancopoulos GD, Hamilton JD, MacDonnell S, Hamon SC, Boyapati A, **Morton L**. Association of complement pathways with COVID-19 severity and outcomes. **Microbes Infect**. 2023 May;25(4):105081. doi: 10.1016/j.micinf.2022.105081.

MacDonnell S, Megna J, Ruan Q, Zhu O, Halasz G, Jasewicz D, Powers K, E H, Del Pilar Molina-Portela M, Jin X, Zhang D, Torello J, Feric NT, Graziano MP, Shekhar A, Dunn ME, Glass D, **Morton L**. Activin A directly impairs human cardiomyocyte contractile function indicating a potential role in heart failure development. **Front Cardiovasc Med**. 2022 Nov 10;9:1038114. doi: 10.3389/fcvm.2022.1038114.

Devalaraja-Narashimha K, Huang C, Cao M, Chen YP, Borodovsky A, Olson WC, **Morton LG**, Retter MW. Pharmacokinetics and pharmacodynamics of pozelimab alone or in combination with cemdisiran in non-human primates. **PLoS One**. 2022 Jun 16;17(6):e0269749. doi: 10.1371/journal.pone.0269749.

McAlevy M, Zhang Q, Ehmann PJ, Xu J, Wipperman MF, Ajithdoss D, Pan L, Wakai M, Simonson R, Gadi A, Oyejide A, Hamon SC, Boyapati A, **Morton LG**, Shavlakadze T, Kyratsous CA, Glass DJ. The Activin/FLRG Pathway Associates with Poor COVID-19 Outcomes in Hospitalized Patients. **Mol Cell Biol**. 2022 Jan 20;42(1):e0046721. doi: 10.1128/MCB.00467-21.

Sharman Moser S, Chodick G, Ni YG, Chalothorn D, Wang MD, Shuldiner AR, **Morton L**, Salomon O, Jalbert JJ. The Association between Factor XI Deficiency and the Risk of Bleeding, Cardiovascular, and Venous Thromboembolic Events. **Thromb Haemost**. 2022 May;122(5):808-817. doi: 10.1055/s-0041-1735971.

Powers K, Chang R, Torello J, Silva R, Cadoret Y, Cupelo W, **Morton L**, Dunn M. Development of a semi-automated segmentation tool for high frequency ultrasound image analysis of mouse echocardiograms. **Sci Rep**. 2021 Mar 22;11(1):6559. doi: 10.1038/s41598-021-85971-3.

Abedini A, Zhu YO, Chatterjee S, Halasz G, Devalaraja-Narashimha K, Shrestha R, S Balzer M, Park J, Zhou T, Ma Z, Sullivan KM, Hu H, Sheng X, Liu H, Wei Y, Boustany-Kari CM, Patel U, Almaani S, Palmer M, Townsend R, Blady S, Hogan J, **Morton L**, Susztak K; TRIDENT Study Investigators. Urinary Single-Cell Profiling Captures the Cellular Diversity of the Kidney. **J Am Soc Nephrol**. 2021 Mar;32(3):614-627. doi: 10.1681/ASN.2020050757

Abedini A, Zhu YO, Chatterjee S, Halasz G, Devalaraja-Narashimha K, Shrestha R, S Balzer M, Park J, Zhou T, Ma Z, Sullivan KM, Hu H, Sheng X, Liu H, Wei Y, Boustany-Kari CM, Patel U, Almaani S, Palmer M, Townsend R, Blady S, Hogan J, **Morton L**, Susztak K; TRIDENT Study Investigators. Urinary Single-Cell Profiling Captures the Cellular Diversity of the Kidney. **J Am Soc Nephrol**. 2021 Mar;32(3):614-627. doi: 10.1681/ASN.2020050757.

Devalaraja-Narashimha K, Meagher K, Luo Y, Huang C, Kaplan T, Muthuswamy A, Halasz G, Casanova S, O'Brien J, Peyser Boiarsky R, McWhirter J, Gartner H, Bai Y, MacDonnell S, Liu C, Hu Y, Latuszek A, Wei Y, Prasad S, Huang T, Yancopoulos G, Murphy A, Olson W, Zambrowicz B, Macdonald L, **Morton LG**. Humanized C3 Mouse: A Novel Accelerated Model of C3 Glomerulopathy. **J Am Soc Nephrol**. 2021 Jan;32(1):99-114. doi: 10.1681/ASN.2020050698. Epub 2020 Dec 7. PMID: 33288630; PMCID: PMC7894673.

Latuszek A, Liu Y, Olsen O, Foster R, Cao M, Lovric I, Yuan M, Liu N, Chen H, Zhang Q, Xiao H, Springer C, Ehrlich G, Kamat V, Rafique A, Hu Y, Krueger P, Huang T, Poueymirou W, Babb R, Rosconi MP, Retter MW, Chen G, **Morton L**, Zambrowicz B, Cao J, Romano C, Olson WC. "Inhibition of complement pathway activation with Pozelimab, a fully human antibody to complement component C5." **PLoS One**. 2020 May 8;15(5):e0231892.

Rationale and design of the Transformative Research in Diabetic Nephropathy (TRIDENT) Study. Townsend RR, Guarnieri P, Argyropoulos C, Blady S, Boustany-Kari CM, Devalaraja-Narashimha

K, **Morton L**, Mottl AK, Patel U, Palmer M, Ross MJ, Sarov-Blat L, Steinbugler K, Susztak K; TRIDENT Study Investigators. **Kidney Int.** 2020 Jan;97(1):10-13. doi: 10.1016/j.kint.2019.09.020.

Macdonald LE, Meagher KA, Franklin MC, Levenkova N, Hansen J, Badithe AT, Zhong M, Krueger P, Rafique A, Tu N, Shevchuk J, Wadhwa S, Ehrlich G, Bautista J, Grant C, Esau L, Poueymirou WT, Auerbach W, **Morton L**, Babb R, Chen G, Huang T, MacDonald D, Graham K, Gurer C, Voronina VA, McWhirter JR, Guo C, Yancopoulos GD, Murphy AJ. Kappa-on-Heavy (KoH) bodies are a distinct class of fully-human antibody-like therapeutic agents with antigen-binding properties. **Proc Natl Acad Sci U S A.** 2020 Jan 7;117(1):292-299.

Peyser R, MacDonnell S, Gao Y, Cheng L, Kim Y, Kaplan T, Ruan Q, Wei Y, Ni M, Adler C, Zhang W, Devalaraja-Narashimha K, Grindley J, Halasz G, **Morton L**. Defining the Activated Fibroblast Population in Lung Fibrosis Using Single-Cell Sequencing. **Am J Respir Cell Mol Biol.** 2019 Jul;61(1):74-85.

Gross O, Kashtan CE, Rheault MN, Flinter F, Savige J, Miner JH, Torra R, Ars E, Deltas C, Savva I, Perin L, Renieri A, Ariani F, Mari F, Baigent C, Judge P, Knebelman B, Heidet L, Lagas S, Blatt D, Ding J, Zhang Y, Gale DP, Prunotto M, Xue Y, Schachter AD, **Morton LCG**, Blem J, Huang M, Liu S, Vallee S, Renault D, Schifter J, Skelding J, Gear S, Friede T, Turner AN, Lennon R. Advances and unmet needs in genetic, basic and clinical science in Alport syndrome: report from the 2015 International Workshop on Alport Syndrome. **Nephrol Dial Transplant.** 2017 Jun 1;32(6):916-924.

Wei K, Pieciewicz SM, McGinnis LM, Taniguchi CM, Wiegand SJ, Anderson K, Chan CW, Mulligan KX, Kuo D, Yuan J, Vallon M, **Morton LC**, Lefai E, Simon MC, Maher JJ, Mithieux G, Rajas F, Annes JP, McGuinness OP, Thurston G, Giaccia AJ, Kuo CJ. A liver Hif-2 α -Irs2 pathway sensitizes hepatic insulin signaling and is modulated by Vegf inhibition. **Nat Med.** 2013 Oct;19(10):1331-7.

Raz R, Stricker S, Gazzero E, Clor JL, Witte F, Nistala H, Zabski S, Pereira RC, Stadmeier L, Wang X, **Gowen L**, Sleeman MW, Yancopoulos GD, Canalis E, Mundlos S, Valenzuela DM, Economides AN. The mutation ROR2W749X, linked to human BDB, is a recessive mutation in the mouse, causing brachydactyly, mediating patterning of joints and modeling recessive Robinow syndrome. **Development.** 2008 May;135(9):1713-23.

Torres R, Croll SD, Vercollone J, Reinhardt J, Griffiths J, Zabski S, Anderson KD, Adams NC, **Gowen L**, Sleeman MW, Valenzuela DM, Wiegand SJ, Yancopoulos GD, Murphy AJ. Mice genetically deficient in neuromedin U receptor 2, but not neuromedin U receptor 1, have impaired nociceptive responses. **Pain.** 2007 Aug;130(3):267-78.

Xu J, **Gowen L**, Raphaelides C, Hoyer KK, Weinger JG, Renard M, Troke JJ, Vaitheeswaran B, Lee WN, Saad MF, Sleeman MW, Teitell MA, Kurland IJ. Decreased hepatic futile cycling compensates for increased glucose disposal in the Pten heterodeficient mouse. **Diabetes.** 2006 Dec;55(12):3372-80.

Kamba T, Tam BY, Hashizume H, Haskell A, Sennino B, Mancuso MR, Norberg SM, O'Brien SM, Davis RB, **Gowen LC**, Anderson KD, Thurston G, Joho S, Springer ML, Kuo CJ, McDonald DM. VEGF-dependent plasticity of fenestrated capillaries in the normal adult microvasculature. **Am J Physiol Heart Circ Physiol.** 2006 Feb;290(2):H560-76

Macdonald LE, Wortley KE, **Gowen LC**, Anderson KD, Murray JD, Poueymirou WT, Simmons MV, Barber D, Valenzuela DM, Economides AN, Wiegand SJ, Yancopoulos GD, Sleeman MW, Murphy AJ. Resistance to diet-induced obesity in mice globally overexpressing OGH/GPB5. **Proc Natl Acad Sci U**

S A. 2005 Feb 15;102(7):2496-501.

Sleeman MW, Wortley KE, Lai KM, **Gowen LC**, Kintner J, Kline WO, Garcia K, Stitt TN, Yancopoulos GD, Wiegand SJ, Glass DJ. Absence of the lipid phosphatase SHIP2 confers resistance to dietary obesity. **Nat Med.** 2005 Feb;11(2):199-205.

Gowen LC, Petersen DN, Mansolf AL, Qi H, Stock JL, Tkalcovic GT, Simmons HA, Crawford DT, Chidsey-Frink KL, Ke HZ, McNeish JD, Brown TA. Targeted disruption of the osteoblast/osteocyte factor 45 gene (OF45) results in increased bone formation and bone mass. **J Biol Chem.** 2003 Jan 17;278(3):1998-2007.

Bennett LM, McAllister KA, Malphurs J, Ward T, Collins NK, Seely JC, **Gowen LC**, Koller BH, Davis BJ, Wiseman RW. Mice heterozygous for a Brca1 or Brca2 mutation display distinct mammary gland and ovarian phenotypes in response to diethylstilbestrol. **Cancer Res.** 2000 Jul 1;60(13):3461-9.

Snouwaert JN, **Gowen LC**, Latour AM, Mohn AR, Xiao A, DiBiase L, Koller BH. BRCA1 deficient embryonic stem cells display a decreased homologous recombination frequency and an increased frequency of non-homologous recombination that is corrected by expression of a brca1 transgene. **Oncogene.** 1999 Dec 20;18(55):7900-7.

Cressman VL, Backlund DC, Hicks EM, **Gowen LC**, Godfrey V, Koller BH. Mammary tumor formation in p53- and BRCA1-deficient mice. **Cell Growth Differ.** 1999 Jan;10(1):1-10.

Hanford MG, Rushton BC, **Gowen LC**, Farber RA. Microsatellite mutation rates in cancer cell lines deficient or proficient in mismatch repair. **Oncogene.** 1998 May 7;16(18):2389-93.

Snouwaert JN, **Gowen LC**, Lee V, Koller BH. Characterization of Brca1 deficient mice. **Breast Dis.** 1998 Apr;10(1-2):33-44.

Gowen LC, Johnson BL, Latour AM, Sulik KK, Koller BH. Brca1 deficiency results in early embryonic lethality characterized by neuroepithelial abnormalities. **Nat Genet.** 1996 Feb;12(2):191-4.

Krishnamoorthy A, **Gowen LC**, Boll KE, Knuppel RA, Sciorra LJ. Chromosome and interphase analysis of placental mosaicism in intrauterine growth retardation. **J Perinatol.** 1995 Jan-Feb;15(1):47-50.

Patents

Available upon request

Corporate Service

- | | |
|---|--------------|
| • Executive Sponsor, Regeneron R&PD Communications | 2024-present |
| • Executive Sponsor, Regeneron R&PD Manager Development | 2022-present |
| • Executive Sponsor, Women In Industry, Science, and Engineering at Regeneron | 2018-present |
| • Regeneron Post-Doctoral Steering Committee | 2016-present |
| • Regeneron STEM Education Committee | 2012-present |
| • Regeneron Institutional Animal Care and Use Committee | 2003-2013 |

Public Service

- Westchester County Board of Laboratory Managers 2021-present
- Town of New Castle, NY Beautification Advisory Board Member & Chair 2020-present
- Town of New Castle, NY Town Board Member 2021-2022
- Chappaqua Children's Book Festival Board Member 2012-2023
- Chappaqua PTA STEM Committee, Founding Member & Chair 2013-2019

Awards

- **Fiercest Women in Life Sciences** 2022
- **New York Assembly District 93 Women of Distinction Award** 2022
- **Point of Light foundation**, Daily Point of Light # 6446 2019
<https://www.pointsoflight.org/awards/scientist-sparks-discovery-and-spreads-awareness-of-stem-through-volunteerism/>
- **914 Inc. Women in Business Award** 2019
<http://www.westchestermagazine.com/914-INC/Q4-2019/Women-in-Business-2019/Lori-Morton-PhD/>
- **Regeneron Volunteer of the Year** 2018
- **Regeneron Volunteer of the Year**, honorable mention 2017