Eric S. Lander

Data di nascita 3 febbraio 1957

Luogo New York, NY (USA)

Nomina 25 febbraio 2020

Disciplina Genetica e matematica

Titolo Presidente e Direttore fondatore, The Eli and Edythe L. Broad Institute of MIT and Harvard; Professore di biologia, MIT; Professore di biologia dei sistemi, Harvard Medical School

Principali premi, riconoscimenti e accademie

Elected Academies: Council on Foreign Relations, 2014; Royal Swedish Academy of Sciences, Class of Biosciences, 2013 European Molecular Biology Organization, 2012; Academy of Athens, 2009; U.S. Institute of Medicine, 1999; American Academy of Arts and Sciences, 1999; American Academy of Achievement, 1999; U.S. National Academy of Sciences, 1997. *Honorary Doctorates*: Ben-Gurion University of the Negev, Israel, Honorary Doctorate, 2017; Universite# catholique de Louvain, Belgium, Honorary Doctorate, 2017; Brandeis University, Honorary Doctorate, 2014; Worcester Polytechnic Institute, Honorary Doctorate and Commencement Speaker, 2013 Columbia University, Honorary Doctorate, 2008; Lund University, Sweden, Honorary Doctorate, 2007; Northeastern University, Honorary Doctorate and Commencement Speaker, 2005 University of Massachusetts at Lowell, Honorary Doctorate, 2005; Williams College, Honorary Doctorate and Commencement Speaker, 2003; Mount Sinai School of Medicine, Honorary Doctorate, 2001 Medical College of Wisconsin, Honorary Doctorate, 2001 Tel Aviv University, Honorary Doctorate, 2000. *Selected Awards and Prizes*: Association for Molecular Pathology (AMP) Award for Excellence in Molecular Diagnostics, 2016 Friends of Cancer Research Leadership Award, 2016 “for pioneering research unlocking the molecular origins of cancer, leadership guiding our nation’s scientific priorities, and dedication to empowering a new generation of researchers to accelerate biomedical advancements”; James R. Killian, Jr. Faculty Achievement Award, MIT, 2016 “for extraordinary professional achievements by an MIT faculty member” Fellow, American Association for Cancer Research Academy, 2016; AAAS Philip Hauge Abelson Prize, 2015 “for signal contributions to the advancement of science in the United States”; Han-Mo Koo Memorial Award, Van Andel Institute, 2015; Time Magazine’s 10 years of Influence, 2013; Block Memorial Award for Distinguished Achievement in Cancer Research, Ohio State University, 2013; Breakthrough Prize in Life Sciences, 2013 ”For the discovery of general principles for identifying human disease genes, and enabling their application to medicine through the creation and analysis of genetic, physical and sequence maps of the human genome”; Harvey Prize for Human Health, Technion University, Israel, 2012 ”In recognition of his significant contributions to the field of genomics, as the driving force behind most of the major advances in this field”; Dan David Prize, Genome Research, Tel Aviv University, Israel, 2012 “For the Future Dimension - Genome Research”; Dart/ NYU Biotechnology Achievement Award, 2012; Albany Prize in Medicine and Biomedical Research, Albany Medical College, 2010; New York Academy of Medicine Medal for Distinguished Contribution in Biomedical Sciences, 2009 A. Clifford Barger Excellence in Mentoring Award, Harvard Medical School, 2008-2009; US News & World Report “America’s Best Leaders,” 2006; Reenpaa Medal, Finnish Cultural Foundation, 2006; AAAS Award for Public Understanding of Science and Technology, 2004 “for his excellence in communicating complex scientific ideas, and their implications for society, to the general public and policy-makers, while actively engaged in a demanding and aggressive research program”; Research!America Award for Sustained Leadership at the National Level, 2004 Lila Gruber Cancer Award, American Academy of Dermatology, 2004; Time Magazine, List of “100 Most Influential People in the World Today,” 2004 Josiah Willard Gibbs Prize Lecturer, American Mathematical Society, 2004 American Scientist of the Year Award, R&D Magazine, 2003; Scientist of the Year Award, National Disease Research Interchange, 2003 Alfred Benzon Foundation Prize, Denmark, 2002; Gairdner Foundation International Award, Canada, 2002 “for his major seminal contribution to the sequencing of the human and other genomes” John von Neumann Award, Society for Industrial and

Applied Mathematics, Philadelphia, 2002 Special Achievement Award, Miami Nature Biotechnology Winter Symposium, 2002; City of Medicine Award, 2001, with John Sulston and Robert Waterston; Max Delbruck Medal, Berlin, 2001; J. Allyn Taylor Prize, Canada, 2001; Novartis Drew Award in Biomedical Research, 2001; Distinguished Service Award, American College of Neuropsychopharmacology, 2001; Allen Award, American Society of Human Genetics, 2000 “to the community of scientists that carried out the Human Genome Project”, accepted on behalf of community, together with Francis Collins and Craig Venter; Beckman Prize, American Association for Lab Automation, 2000; Millennium Lecturer, The White House, October 1999; Pasarow Prize in Cancer, Robert J. and Claire Pasarow Foundation 1998; Chiron Prize for Biotechnology, American Society for Microbiology 1998; Phi Beta Kappa Associates Award, 1998 “for outstanding work as a scientist”; Woodrow Wilson Award for Public Service, Princeton University, 1998 “the university's highest award to an alumnus of the undergraduate college"; American Academy of Microbiology, elected 1997; Dickson Prize in Medicine, University of Pittsburgh, 1997; Class of 1960 Fellows Award, Massachusetts Institute of Technology, 1996 “for outstanding teaching”; Kroc Distinguished Lecturer, University of Washington, Seattle, 1996 Rhoads Memorial Award, American Association for Cancer Research, 1995 “for excellence in cancer research”; Herman Beerman Lecturer, Society for Investigative Dermatology, 1995; Herbert Boyer Lecturer in Genetics, University of California at San Francisco, 1995; Gladstone Distinguished Lecturer, Gladstone Institute, 1994; Ralph R. Braund Distinguished Visiting Professor, University of Tennessee, 1994 Herbert W. Dickerman Award, New York Department of Health, 1993; Christian A. Herter Distinguished Lecturer, New York University, 1993; Baker Memorial Prize for Excellence in Undergraduate Teaching, MIT, 1992 Fellow, American Association for the Advancement of Science, 1990 “for research on the application of mathematical and statistical approaches to molecular genetics”; MacArthur Prize Fellow, for research in human genetics and mathematics, 1987–1992 Rhodes Scholar, 1978-1981; Johnson Memorial Bequest, Oxford University, for best thesis in mathematics, June 1981 Senior Prize, Oxford University, June 1981; Valedictorian, Princeton University, June 1978 Pyne Prize, Princeton University, February 1978 “the highest award the university confers upon an undergraduate”; Phi Beta Kappa Award, Princeton University, June 1978 “for highest academic achievement”; Class of 1863 Prize and Andrew Brown Prize in Mathematics, Princeton University, 1976, 1977; U.S. Mathematical Olympiad Team, Silver Medal, 16th International Mathematical Olympiad, Erfurt, East Germany, 1974; First Place, Westinghouse Science Talent Search, 1974. *Government Service*: Defense Innovation Board, Office of the Secretary of Defense: Member, 2016-present; President’s Council on Jobs and Competitiveness (President’s Jobs Council), Executive Office of the President: Member, 2011-2012; President’s Council of Advisors on Science and Technology (PCAST), Executive Office of the President: Co-Chair, 2009-2017; Presidential Commission on the National Medal of Science: Member, 1995-2000; National Institutes of Health: Member, Advisory Committee to the Director, 1995-2000; National Cancer Advisory Board: Member, 2003-2006; National Institute of Mental Health: Member, Genetics Working Group, 1997-1998; National Center for Human Genome Research (NIH): Chair, Genome Research Review Committee, 1990-1994; National Science Foundation: Member, Advisory Committee, Biological and Behavioral Sciences, 1989-1994; National Center for Human Genome Research (NIH): Chair, Ad Hoc Study Section on New Technologies for Genome Analysis, 1989; National Library of Medicine (NIH): Chair, Ad Hoc Study Section on Analysis of Molecular Biology Data, 1988; National Institutes of Health: Chair, Subcommittee on Genetic Information, Advisory Committee on Human Genome Project, 1988; National Heart Lung and Blood Institute (NIH): Member, Special Panel on Applications of Molecular Genetics to Hypertension and Atherosclerosis, 1988; Congressional Office of Technology Assessment: Member, Panel on DNA Forensics, 1989.

Riassunto dell’attività scientifica

Dr. Lander was one of the principal leaders of the Human Genome Project. A geneticist, molecular biologist, and mathematician, he has played a pioneering role in the reading, understanding, and biomedical application of the human genome — including developing powerful methods for discovering the molecular basis of human diseases that are used around the world. He has received numerous national and international honors for his work.

Dr. Lander has served as a scientific advisor to the United States government across multiple administrations, including to the White House, the Department of Health and Human Services, and the Department of Defense.

Dr. Lander is the president and founding director of the Broad Institute, a research institute focused on genomic medicine that is closely affiliated with MIT, Harvard and five of Boston’s major hospitals. He is also a professor at MIT and the Harvard Medical School.

Pubblicazioni principali

Books: Lander, E.S. (1983). *Symmetric designs: an algebraic approach* (Vol. 74). New York, NY: Cambridge University Press; Lander, E.S., & Waterman, M.S. (Eds.). (1995). *Calculating the secrets of life: Contributions of the mathematical sciences to molecular biology*. Washington DC: National Academy Press. *Articles*: Vallabh, S.M., Minikel, E.V., Schreiber, S.L. & Lander, E.S. (2020). Towards a treatment for genetic prion disease:

trials and biomarkers. *The Lancet*. *Neurology*. 19(4): 361-368; Ray, J.P., de Boer, C.G., Fulco, C.P., Lareau, C.A., Kanai, M., Ulirsch, J.C., Tewhey, R., Ludwig, L.S., Reilly, S.K., Bergman, D.T., Engreitz, J.M., Issner, R., Finucane, H.K., Lander, E.S., Regev, A. & Hacohen, N. (2020). Prioritizing disease and trait causal variants at the TNFAIP3 locus using functional and genomic features. *Nature communications.* 11(1): 1237; Painter, C.A., Jain, E., Tomson, B.N., Dunphy, M., Stoddard, R.E., Thomas, B.S., Damon, A.L., Shah, S., Kim, D., Gomez Tejeda Zanudo, J., Hornick, J.L., Chen, Y.L., Merriam, P., Raut, C.P., Demetri, G.D., Van Tine, B.A., Lander, E.S., Golub, T.R. & Wagle, N. (2020). The Angiosarcoma Project: enabling genomic and clinical discoveries in a rare cancer through patient-partnered research. *Nature medicine*. 26(2): 181-187; Dietlein, F., Weghorn, D., Taylor-Weiner, A., Richters, A., Reardon, B., Liu, D., Lander, E.S., Van Allen, E.M. & Sunyaev, S.R. (2020). Identification of cancer driver genes based on nucleotide context. *Nature genetics*. 52(2): 208-218; Basak, A., Munschauer, M., Lareau, C.A., Montbleau, K.E., Ulirsch, J.C., Hartigan, C.R., Schenone, M., Lian, J., Wang, Y., Huang, Y., Wu, X., Gehrke, L., Rice, C.M., An, X., Christou, H.A., Mohandas, N., Carr, S.A., Chen, J.J., Orkin, S.H., Lander, E.S. & Sankaran, V.G. (2020). Control of human hemoglobin switching by LIN28B-mediated regulation of BCL11A translation. *Nature genetics.* 52(2): 138-145; Fulco, C.P., Nasser, J., Jones, T.R., Munson, G., Bergman, D.T., Subramanian, V., Grossman, S.R., Anyoha, R., Doughty, B.R., Patwardhan, T.A., Nguyen, T.H., Kane, M., Perez, E.M., Durand, N.C., Lareau, C.A., Stamenova, E.K., Aiden, E.L., Lander, E.S., & Engreitz, J.M. (2019). Activity-by-contact model of enhancer-promoter regulation from thousands of CRISPR perturbations. *Nat Genet.* 51(12): 1664-1669; Khera, A.V., Mason-Suares, H., Brockman, D., Wang, M., VanDenburgh, M.J., Senol-Cosar, O., Patterson, C., Newton-Cheh, C., Zekavat, S.M., Pester, J., Chasman, D.I., Kabrhel, C., Jensen, M.K., Manson, J.E., Gaziano, J.M., Taylor, K.D., Sotoodehnia, N., Post, W.S., Rich, S.S., Rotter, J.I., Lander, E.S., Rehm, H.L., Ng K., Philippakis, A., Lebo, M., Albert, C.M., & Kathiresan, S. (2019). Rare Genetic Variants Associated With Sudden Cardiac Death in Adults. *J Am Coll Cardiol.* 74(21): 2623-2634; Hoch, E., Florez, J.C., Lander, E.S., & Jacobs, S.B.R. (2019). Gain-of-Function Claims for Type-2-Diabetes-Associated Coding Variants in SLC16A11 Are Not Supported by the Experimental Data. *Cell Rep.* 29(3): 778-780; Lander, E.S. et al. (2019). Chinese scientists and US leadership in the life sciences. *Nat Biotechnol.* 37(11): 1261-1263; Lander, E.S. et al. (2019). Small Molecule Targets TMED9 and Promotes Lysosomal Degradation to Reverse Proteinopathy. *Cell*. 178(3): 521-535 e23; Lander, E.S. et al. (2019) Ultra-Rare Genetic Variation in the Epilepsies: A Whole-Exome Sequencing Study of 17,606 Individuals. *Am J Hum Genet.* 105(2): 267-282; Johnson, E.O., LaVerriere, E., Office, E., Stanley, M., Meyer, E., Kawate, T., Gomez, J.E., Audette, R.E., Bandyopadhyay, N., Betancourt, N., Delano, K., Da Silva, I., Davis, J., Gallo, C., Gardner, M., Golas, A.J., Guinn, K.M., Kennedy, S., Korn, R., McConnell, J.A., Moss, C.E., Murphy, K.C., Nietupski, R.M., Papavinasasundaram, K.G., Pinkham, J.T., Pino, P.A., Proulx, M.K., Ruecker, N., Song, N., Thompson, M., Trujillo, C., Wakabayashi, S., Wallach, J.B., Watson, C., Ioerger, T.R., Lander, E.S., Hubbard, B.K., Serrano-Wu, M.H., Ehrt, S., Fitzgerald, M., Rubin, E.J., Sassetti C. M., Schnappinger, D., Hung, D.T. & (2019). Large-scale chemical-genetics yields new M. tuberculosis inhibitor classes. *Nature*. 571(7763): 72-78; Ulirsch, J.C., Verboon, J.M., Kazerounian, S., Guo, M.H., Yuan, D., Ludwig, L.S., Handsaker, R.E., Abdulhay, N.J., Fiorini, C., Genovese, G., Lim, E.T., Cheng, A., Cummings, B.B., Chao, K.R., Beggs, A.H., Genetti, C.A., Sieff, C.A., Newburger, P.E., Niewiadomska, E., Matysiak, M., Vlachos, A., Lipton, J.M., Atsidaftos, E., Glader, B., Narla, A., Gleizes, P.E., O'Donohue, M.F., Montel-Lehry, N., Amor, D.J., McCarroll, S.A., O'Donnell-Luria, A.H., Gupta, N., Gabriel, S.B., MacArthur, D.G., Lander, E.S., Lek, M., Da Costa, L., Nathan, D.G., Korostelev, A.A., Do, R., Sankaran, V.G. & Gazda, H.T. (2019). The Genetic Landscape of Diamond-Blackfan Anemia. *Am J Hum Genet*. 104: 356; Poulsen, B.E., Yang, R., Clatworthy, A.E., White, T., Osmulski, S.J., Li, L., Penaranda, C., Lander, E.S., Shoresh, N. & Hung, D.T. (2019). Defining the core essential genome of Pseudomonas aeruginosa. *Proc Natl Acad Sci U S A*.; Lander, E.S., Baylis, F., Zhang, F., Charpentier, E., Berg, P., Bourgain, C., Friedrich, B., Joung, J.K., Li, J., Liu, D., Naldini, L., Nie, J.B., Qiu, R., Schoene-Seifert, B., Shao, F., Terry, S., Wei, W. & Winnacker, E.L. (2019). Adopt a moratorium on heritable genome editing. *Nature*. 567: 165-168; Khera, A.V., Chaffin, M., Wade, K.H., Zahid, S., Brancale, J., Xia, R., Distefano, M., Senol-Cosar, O., Haas, M.E., Bick, A., Aragam, K.G., Lander, E.S., Smith, G.D., Mason-Suares, H., Fornage, M., Lebo, M., Timpson, N.J., Kaplan, L.M. & Kathiresan, S. (2019). Polygenic Prediction of Weight and Obesity Trajectories from Birth to Adulthood. *Cell*. 177: 587-596 e589; Lander, E.S. (2019). 2018 William Allan Award: Discovering the Genes for Common Disease: From Families to Populations. *Am J Hum Genet*, 104(3): 375-383; Schiebinger, G., Shu, J., Tabaka, M., Cleary, B., Subramanian, V., Solomon. A., Gould, J., Liu, S., Lin, S., Berube, P., Lee, L., Chen, J., Brumbaugh, J., Rigollet, P., Hochedlinger, K., Jaenisch, R., Regev, A., & Lander, E.S. (2019). Optimal-Transport Analysis of Single-Cell Gene Expression Identifies Developmental Trajectories in Reprogramming. *Cell*, 176(4): 928-943.e22; Keskin, D.B., Anandappa, A.J., Sun, J., Tirosh, I., Mathewson, N.D., Li, S., Oliveira, G., Giobbie-Hurder, A., Felt, K., Gjini, E., Shukla, S.A., Hu, Z., Li, L., Le, P.M., Allesoe, R.L., Richman, A.R., Kowalczyk, M.S., Abdelrahman, S., Geduldig, J.E., Charbonneau, S., Pelton, K., Iorgulescu, J.B., Elagina, L., Zhang, W., Olive, O., McCluskey, C., Olsen, L.R., Stevens, J., Lane, W.J., Salazar, A.M., Daley, H., Wen, P.Y., Chiocca, E.A., Harden, M., Lennon, N.J., Gabriel, S., Getz, G., Lander, E.S., Regev, A., Ritz, J., Neuberg, D., Rodig, S.J., Ligon, K.L., Suva, M.L., Wucherpfennig, K.W., Hacohen, N., Fritsch, E.F., Livak, K.J., Ott,

P.A., Wu, C.J. & Reardon, D.A. (2019). Neoantigen vaccine generates intratumoral T cell responses in phase Ib glioblastoma trial. *Nature*, 565(7738): 234-239; Adelmann, C.H., Wang, T., Sabatini, D.M. & Lander, E.S. (2019). Genome-Wide CRISPR/Cas9 Screening for Identification of Cancer Genes in Cell Lines. *Methods in Molecular Biology*, 1907: 125-136.