

BIOGRAPHICAL SKETCH

NAME PERRON Hervé		POSITION TITLE Director, University of Lyon-Geneuro Associated Team Director, Geneuro-Innovation, Lyon-France. Chief Scientific Officer, Geneuro, Geneva-Switzerland.	
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EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	YEAR(S)	FIELD OF STUDY
Joseph Fourier University, Grenoble, France	PhD	1991	Virology / Neurovirology
Faculty of Medicine, Univ. Grenoble-Alpes, France	HDR	2000	Human Biology & Physiology

A. Personal Statement

I have been working in the field of multiple sclerosis (MS) for more than 25 years. During my PhD, I isolated and characterized a novel retroviral element from Multiple Sclerosis (MSRV), itself defining a novel family of human endogenous elements (HERV-W) that now appears to be implicated in other autoimmune diseases such as type 1 diabetes. As an expert at the interface with various scientific and medical disciplines, I reviewed over a hundred manuscripts for over 60 scientific and medical journals. I am author in 90 peer-reviewed publications already referenced in PubMed, 1720 nucleotide and 508 protein sequences deposited in databases (NCBI, May 2019 search). I am member of the Doctoral School of the Lyon University and director of the UCBL-Geneuro Innovation collaborative unit at the faculty of medicine Lyon-Laënnec. I am PI of a research program of the nPOD-JDRF network for type 1 Diabetes research, University of Florida. As Chief Scientific Officer of Geneuro SA, which I have co-founded, I am actively involved in the development of innovative therapeutics for diseases involving human endogenous retroviruses, such as Multiple Sclerosis and Type-1 diabetes (in Phase II clinical trials), but also in Amyotrophic lateral Sclerosis for preclinical and clinical development in collaboration with the NIH (NINDS) and in psychoses displaying systemic and brain inflammation with FondaMental Foundation.

B. Positions and Honors

Positions and Employment

Present positions:

2010- Director of Geneuro-UCBL Joint Unit, Faculty of medicine Laënnec, Lyon, France
 2009- Director of Geneuro-Innovation, Lyon, France
 2006- Chief Scientific Officer, Geneuro, Geneva, Switzerland

Past positions:

2001-2006 Head of Neurological Biomarker R&D unit, bioMérieux, France
 2001-2006 Associate Research Director-INSERM, France.
 1999-2001 Scientific Director, Stelhys, France.

- 1993-1998 Project Manager, CNRS-bioMérieux Unit, Ecole Normale Supérieure, Lyon, France.
- 1992-1993 Research Manager, CNRS-bioMérieux Unit, Ecole Normale Supérieure, Lyon, France
- 1988-1991 Research Scientist, Dept of Microbiology & Virology, University Hospital, Grenoble France.

Professional Memberships

- 1998- International Society of NeuroVirology
- 2015- American Diabetes Association

C. Selected Peer-Reviewed Publications Since 2009 (last 10 years).

1. Kremer, D., J. Gruchot, V. Weyers, L. Oldemeier, P. Gottle, L. Healy, J. Ho Jang, T.X.Y. Kang, C. Volsko, R. Dutta, B.D. Trapp, H. Perron, H.P. Hartung, and P. Kury, *pHERV-W envelope protein fuels microglial cell-dependent damage of myelinated axons in multiple sclerosis*. **Proc Natl Acad Sci U S A**, 2019. 116(30): p. 15216-15225.
2. Gottle, P., M. Forster, J. Gruchot, D. Kremer, H.P. Hartung, H. Perron, and P. Kury, *Rescuing the negative impact of human endogenous retrovirus envelope protein on oligodendroglial differentiation and myelination*. **Glia**, 2019. 67(1): p. 160-170.
3. Thomas, J., H. Perron, and C. Feschotte, *Variation in proviral content among human genomes mediated by LTR recombination*. **Mob DNA**, 2018. 9: p. 36.
4. Kury, P., A. Nath, A. Creange, A. Dolei, P. Marche, J. Gold, G. Giovannoni, H.P. Hartung, and H. Perron, *Human Endogenous Retroviruses in Neurological Diseases*. **Trends Mol Med**, 2018. 24(4): p. 379-394.
5. Curtin, F., C. Bernard, S. Levet, H. Perron, H. Porchet, J. Medina, S. Malpass, D. Lloyd, R. Simpson, and R.-T.D. investigators, *A new therapeutic approach for type 1 diabetes: Rationale for GNBAC1, an anti-HERV-W-Env monoclonal antibody*. **Diabetes Obes Metab**, 2018. 20(9): p. 2075-2084.
6. Charvet, B., J.M. Reynaud, G. Gourru-Lesimple, H. Perron, P.N. Marche, and B. Horvat, *Induction of Proinflammatory Multiple Sclerosis-Associated Retrovirus Envelope Protein by Human Herpesvirus-6A and CD46 Receptor Engagement*. **Front Immunol**, 2018. 9: p. 2803.
7. Medina, J. and H. Perron, *[DNA sequences from mobile genetic elements, a hidden half of the human genome]*. **Med Sci (Paris)**, 2017. 33(2): p. 151-158.
8. Medina, J., B. Charvet, P. Leblanc, R. Germi, B. Horvat, P.N. Marche, and H. Perron, *[Endogenous retroviral sequences in the human genome can play a physiological or pathological role]*. **Med Sci (Paris)**, 2017. 33(4): p. 397-403.
9. Levet, S., J. Medina, J. Joanou, A. Demolder, N. Queruel, K. Reant, M. Normand, M. Seffals, J. Dimier, R. Germi, T. Piofczyk, J. Portoukalian, J.L. Touraine, and H. Perron, *An ancestral retroviral protein identified as a therapeutic target in type-1 diabetes*. **JCI Insight**, 2017. 2(17).
10. Kremer, D., R. Glanzman, A. Trabousee, A. Nath, L. Groc, M. Horwitz, P. Gottle, H. Perron, J. Gold, H.P. Hartung, and P. Kury, *Prehistoric enemies within: The contribution of human endogenous retroviruses to neurological diseases. Meeting report: "Second International Workshop on Human Endogenous Retroviruses and Disease", Washington DC, March 13th and 14th 2017*. **Mult Scler Relat Disord**, 2017. 15: p. 18-23.
11. van Horssen, J., S. van der Pol, P. Nijland, S. Amor, and H. Perron, *Human endogenous retrovirus W in brain lesions: Rationale for targeted therapy in multiple sclerosis*. **Mult Scler Relat Disord**, 2016. 8: p. 11-8.
12. Madeira, A., I. Burgelin, H. Perron, F. Curtin, A.B. Lang, and R. Faucard, *MSRV envelope protein is a potent, endogenous and pathogenic agonist of human toll-like receptor 4: Relevance of GNBAC1 in multiple sclerosis treatment*. **J Neuroimmunol**, 2016. 291: p. 29-38.
13. Faucard, R., A. Madeira, N. Gehin, F.J. Authier, P.A. Panaite, C. Lesage, I. Burgelin, M. Bertel, C. Bernard, F. Curtin, A.B. Lang, A.J. Steck, H. Perron, T. Kuntzer, and A. Creange, *Human Endogenous Retrovirus and Neuroinflammation in Chronic Inflammatory Demyelinating Polyradiculoneuropathy*. **EBioMedicine**, 2016. 6: p. 190-8.
14. Nath, A., P. Kury, G. Sciascia do Olival, A. Dolei, H. Karlsson, L. Groc, M. Schneider, J. Kriesel, J.L. Touraine, F. Mallet, P.N. Marche, F. Arnaud, C. Feschotte, and H. Perron, *First international workshop on human endogenous retroviruses and diseases, HERVs & disease 2015*. **Mob DNA**, 2015. 6: p. 20.
15. Kremer, D., M. Forster, T. Schichel, P. Gottle, H.P. Hartung, H. Perron, and P. Kury, *The neutralizing antibody GNBAC1 abrogates HERV-W envelope protein-mediated oligodendroglial maturation blockade*. **Mult Scler**, 2015. 21(9): p. 1200-3.

16. Duperray, A., D. Barbe, G. Raguenez, B.B. Weksler, I.A. Romero, P.O. Couraud, H. Perron, and P.N. Marche, *Inflammatory response of endothelial cells to a human endogenous retrovirus associated with multiple sclerosis is mediated by TLR4*. **Int Immunol**, 2015. 27(11): p. 545-53.
17. Derfuss, T., F. Curtin, C. Guebelin, C. Bridel, M. Rasenack, A. Matthey, R. Du Pasquier, M. Schluep, J. Desmeules, A.B. Lang, H. Perron, R. Faucard, H. Porchet, H.P. Hartung, L. Kappos, and P.H. Lalive, *A phase IIa randomised clinical study of GNBAC1, a humanised monoclonal antibody against the envelope protein of multiple sclerosis-associated endogenous retrovirus in multiple sclerosis patients*. **Mult Scler**, 2015. 21(7): p. 885-93.
18. Curtin, F., H. Perron, A. Kromminga, H. Porchet, and A.B. Lang, *Preclinical and early clinical development of GNBAC1, a humanized IgG4 monoclonal antibody targeting endogenous retroviral MSRV-Env protein*. **MAbs**, 2015. 7(1): p. 265-75.
19. Curtin, F., H. Perron, R. Faucard, H. Porchet, and A.B. Lang, *Treatment against human endogenous retrovirus: a possible personalized medicine approach for multiple sclerosis*. **Mol Diagn Ther**, 2015. 19(5): p. 255-65.
20. Dolei, A., J.A. Garson, G. Arru, M. Clerici, R. Germi, P.N. Marche, and H. Perron, *Multiple sclerosis-associated retrovirus and related human endogenous retrovirus-W in patients with multiple sclerosis*. **J Neuroimmunol**, 2014. 266(1-2): p. 87-8.
21. Perron, H., H.L. Dougier-Reynaud, C. Lomparski, I. Popa, R. Firouzi, J.B. Bertrand, S. Marusic, J. Portoukalian, E. Jouvin-Marche, C.L. Villiers, J.L. Touraine, and P.N. Marche, *Human endogenous retrovirus protein activates innate immunity and promotes experimental allergic encephalomyelitis in mice*. **PLoS One**, 2013. 8(12): p. e80128.
22. Leboyer, M., R. Tamouza, D. Charron, R. Faucard, and H. Perron, *Human endogenous retrovirus type W (HERV-W) in schizophrenia: a new avenue of research at the gene-environment interface*. **World J Biol Psychiatry**, 2013. 14(2): p. 80-90.
23. Kremer, D., T. Schichel, M. Forster, N. Tzekova, C. Bernard, P. van der Valk, J. van Horssen, H.P. Hartung, H. Perron, and P. Kury, *Human endogenous retrovirus type W envelope protein inhibits oligodendroglial precursor cell differentiation*. **Ann Neurol**, 2013. 74(5): p. 721-32.
24. Garcia-Montojo, M., M. Dominguez-Mozo, A. Arias-Leal, A. Garcia-Martinez, V. De las Heras, I. Casanova, R. Faucard, N. Gehin, A. Madeira, R. Arroyo, F. Curtin, R. Alvarez-Lafuente, and H. Perron, *The DNA copy number of human endogenous retrovirus-W (MSRV-type) is increased in multiple sclerosis patients and is influenced by gender and disease severity*. **PLoS One**, 2013. 8(1): p. e53623.
25. do Olival, G.S., T.S. Faria, L.H. Nali, A.C. de Oliveira, J. Casseb, J.E. Vidal, V.B. Cavenaghi, C.P. Tilbery, L. Moraes, M.C. Fink, L.M. Sumita, H. Perron, and C.M. Romano, *Genomic analysis of ERVWE2 locus in patients with multiple sclerosis: absence of genetic association but potential role of human endogenous retrovirus type W elements in molecular mimicry with myelin antigen*. **Front Microbiol**, 2013. 4: p. 172.
26. Perron, H., N. Hamdani, R. Faucard, M. Lajnef, S. Jamain, C. Daban-Huard, S. Sarrazin, E. LeGuen, J. Houenou, M. Delavest, H. Moins-Teisserenc, D. Bengoufa, R. Yolken, A. Madeira, M. Garcia-Montojo, N. Gehin, I. Burgelin, G. Ollagnier, C. Bernard, A. Dumaine, A. Henrion, A. Gombert, K. Le Dudal, D. Charron, R. Krishnamoorthy, R. Tamouza, and M. Leboyer, *Molecular characteristics of Human Endogenous Retrovirus type-W in schizophrenia and bipolar disorder*. **Transl Psychiatry**, 2012. 2: p. e201.
27. Perron, H., R. Germi, C. Bernard, M. Garcia-Montojo, C. Deluen, and L. Farinelli, *Human Endogenous Retrovirus type W Envelope expression in blood and brain cells provides new insights into Multiple Sclerosis disease*. **Multiple Sclerosis journal**, 2012. DOI: 10.1177/1352458512441381.
28. Curtin, F., A.B. Lang, H. Perron, M. Laumonier, V. Vidal, H.C. Porchet, and H.P. Hartung, *GNBAC1, a humanized monoclonal antibody against the envelope protein of multiple sclerosis-associated endogenous retrovirus: a first-in-humans randomized clinical study*. **Clin Ther**, 2012. 34(12): p. 2268-78.
29. Perron, H. and A. Lang, *The human endogenous retrovirus link between genes and environment in multiple sclerosis and in multifactorial diseases associating neuroinflammation*. **Clin Rev Allergy Immunol**, 2010. 39(1): p. 51-61.
30. Saresella, M., A. Rolland, I. Marventano, R. Cavarretta, D. Caputo, P. Marche, H. Perron, and M. Clerici, *Multiple sclerosis-associated retroviral agent (MSRV)-stimulated cytokine production in patients with relapsing-remitting multiple sclerosis*. **Mult Scler**, 2009. 15(4): p. 443-7.
31. Quadrio, I., S. Ugnon-Cafe, M. Dupin, G. Esposito, N. Streichenberger, P. Krolak-Salmon, A. Vital, J.F. Pellissier, A. Perret-Liaudet, and H. Perron, *Rapid diagnosis of human prion disease using streptomycin with tonsil and brain tissues*. **Lab Invest**, 2009. 89(4): p. 406-13.
32. Perron, H., C. Bernard, J.B. Bertrand, A.B. Lang, I. Popa, K. Sanhadji, and J. Portoukalian, *Endogenous retroviral genes, Herpesviruses and gender in Multiple Sclerosis*. **J Neurol Sci**, 2009. 286(1-2): p. 65-72.
33. Dolei, A. and H. Perron, *The multiple sclerosis-associated retrovirus and its HERV-W endogenous family: a biological interface between virology, genetics, and immunology in human physiology and disease*. **J Neurovirol**, 2009. 15(1): p. 4-13.