

## Eric Vivier

06/04/1964

Married, 4 children

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### **Professional addresses:**

- Innate Pharma Research Laboratories, Innate Pharma, 117 Avenue de Luminy, 13276 Marseille cedex 09, France, [www.innate-pharma.com/en/profile/leadership-team/eric-vivier-dvm-phd](http://www.innate-pharma.com/en/profile/leadership-team/eric-vivier-dvm-phd)

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### **Education**

- Doctor in Veterinary Medicine (1987, Ecole Nationale Vétérinaire d'Alfort and Paris 12)

- Ph. D. (1991, Paris 11)

- HDR (1992, Paris 11)

### **Current position**

- Chief Scientific Officer, Head of Innate Pharma Research Laboratories
- Professor of Immunology, Marseille Medical School and Assistance-Publique des Hôpitaux de Marseille (PU-PH Classe Exceptionnelle)
- Head of the "Innate Lymphoid Cell" lab, CIML
- Head of the immunoprofiling lab, La Timone Hospital, Marseille
- Co-founder and coordinator of the Federation Hospitalo-Universitaire Marseille-Immunopole (<http://www.marseille-immunopole.org>)

### **Publications: total 360, h-Index: 101, > 38000 citations**

(see selected publications below)

<http://scholar.google.fr/citations?user=NlmFOgMAAAAJ&hl=fr&oi=ao>

### **Elected membership**

- 2011: European Academy of Tumor Immunology (associate director)
- 2013: French National Academy of Medicine
- 2016: Henry Kunkel Society
- 2018: American Association of Cancer Research
- 2019: EMBO

### **Scientific appointments**

1989-1993:	Postdoctoral fellow, Harvard Medical School, Boston, MA, USA
1995-present:	Head of the "Natural Killer Cells and Innate Immunity" Lab., CIML, France
1996-2001:	Member of the Institut Universitaire de France (Junior)
2002-2004:	Associate Director of the CIML
Summer 2006	Visiting Professor, Scripps Research Institute, La Jolla, CA, USA
2007-present:	Member of the Institut Universitaire de France (Senior)
2008-2017:	Director of the CIML
Summer 2013	Visiting Professor, The Rockefeller University, New York City, NY, USA
2015	Visiting Professor, The Walter and Elisa Hall Institute, Melbourne, VIC, Australia

### **Industry**

- Co-founder of Innate-Pharma ([www.innate-pharma.fr](http://www.innate-pharma.fr))
- 14 patents

### **Selected Funding**

- European Research Council Advanced grants (2011-2016 and 2017-2021)
- European Research Council Proof of Concept Grant 2019
- Investissements d'Avenir, (co-founder of MI-mAbs in 2012: <http://www.mimabs.org>, co-founder of RHU PIONEER in 2017)
- Ligue Nationale contre le Cancer (Equipe Labellisée)
- Agence Nationale de la Recherche

### **Awards**

1987:	Médaille d'Argent, Ecole Nationale Vétérinaire d'Alfort
1996:	National League against Cancer Award
1999:	National Award and Tremplins Rhône-Poulenc Award for Biotech start-ups
1999:	Lucien Tartois Award, Fondation pour la Recherche Médicale
2003:	Jacques Oudin Award, French Society for Immunology
2004:	Joseph Amalric Award, National League against Cancer
2004:	Deutsche Gesellschaft für Immunologie / EFIS Award
2008:	Fondation Del Duca Award– National Academy of Sciences
2009:	Nominee for the EFIS-Schering-Plough European Immunology Prize
2010:	Grand Prix Turpin in Oncology, French National Academy of Science Award
2010:	Grand Prix Charles Oberling in Oncology, Collège de France
2013:	Prix Duquesne, Comité de Paris, National League against Cancer with Sophie Ugolini
2014:	François Kourilsky Lecture at French Society of Immunology, Lille, France
2015:	Visiting Speaker Programme Award, Australasian Society for Immunology
2015-present:	Highly Cited Researcher ( <a href="http://hcr.clarivate.com">hcr.clarivate.com</a> )
2015:	Masters of Immunology, Cancer Immunology Essentials ( <a href="http://www.canimmessentials.aacrjournals.org/masterscrossroads_archive/#evivier">www.canimmessentials.aacrjournals.org/masterscrossroads_archive/#evivier</a> )

2016:	Chevalier de la Légion d'Honneur
2016:	Nominee for the UNSW Eureka Prize for Scientific Research
2016:	Michael Bennett Lecture at UT Southwestern Medical Center, Dallas, TX, USA
2017:	Trophée de l'Attractivité Marseille
2017:	Trophée de la Recherche et de l'Innovation Médicale de Marseille
2018:	Khwarizmi International Award
2018:	Docteur Honoris Causa, Université de Liège

## **Others**

2013 & 2017: Short-listed for the final round of selection for the position of General Director of the Institut Pasteur, Paris

### **National and international committees**

- Expert panel, European Research Council (ERC) Starting grants (until 2017)
- Scientific council, Institut thématique Immunology, Inflammation, Infectiology & Microbiology (I3M), AVIESAN (until 2017)
- Scientific Advisory Board, Ligue Nationale contre le Cancer (2008-2012)
- Scientific council, Institute of Hematology-Immunology-Pneumology – AVIESAN (2010-2015)
- Human Frontier Science Program (HFSP) CDA Review Committee (2012-2014)
- Scientific Advisory Board, Innate Immunity In Cancer, Italian Association for Cancer Research
- Quinquennial Review Committee, Cancer Research UK, Immunology groups
- Administrative board, Bouches-du-Rhône committee, Ligue Nationale contre le Cancer
- Scientific Expertise Committee, Ligue Nationale contre le Cancer IDF
- Parrain for Provence Alpes Côte d'Azur of the Science Tour  
[http://www.lespetitsdebrouillards.org/Media/prods/prod\\_6/](http://www.lespetitsdebrouillards.org/Media/prods/prod_6/)
- Committee of scientific activities, Mediterranean Institute for Advanced Research (until 2017) ([imer.univ-amu.fr](http://imer.univ-amu.fr))
- Strategic and Scientific Committee, Cryostem ([cryostem.org](http://cryostem.org)) (until 2017)
- Scientific Advisory Board, BIOASTER ([bioaster.org](http://bioaster.org)) (until 2017)
- Club M Ambassadeurs ([clubm.marseille.fr](http://clubm.marseille.fr))
- Scientific committee of the BMS foundation
- GIGA Board of Counselors ([giga.ulg.ac.be](http://giga.ulg.ac.be))
- Scientific Advisory Board of the Shanghai Institute of Immunology  
(<http://www3.shsmu.edu.cn/default.php?mod=article&do=detail&tid=329083&fid=10468>)
- Scientific Advisory Board of the Institute Pasteur of Shanghai  
(<http://english.shanghaipasteur.cas.cn>)
- Scientific committee, Biology and Health Dpt, National Research Agency  
(<http://www.agence-nationale-recherche.fr/en/>) (until 2017)
- Ambassadeur M (<http://clubm.marseille.fr/les-ambassadeurs/>)
- Research Advisory Board, Sanofi-Pasteur
- Conseil Scientifique de la Fondation Bettencourt Schueller
- Conseil Scientifique du RHU LUMIERE, Institut Gustave Roussy
- Advisory board member, Universal Scientific Education and Research Network (USERN, <http://usern.tums.ac.ir>)
- Future of Immunology @ Charité - Scientific Advisory Board, Berlin

- Institutional Humanitas Scientific Advisory Board, Milano
- European Science Foundation College of Expert Reviewers

### **Editorial Boards**

- Science Signaling (Board of Reviewing Editors until 2017)
- Nature Reviews Immunology (Highlight advisory panel 2001-2011)
- Immunology & Cell Biology
- Scientific Reports
- Biology Direct
- J. Immunol. (Associate editor, 2001-2005)
- Frontiers in NK cell biology (Specialty chief editor 2010-2014)
- Cancer Immunology Research
- Int. Immunol. (until 2016)
- Oncoimmunology
- Faculty 1000 co-Head of the Leukocyte Activation Section
- F1000 Research
- PLOS ONE
- Current Research in Immunology

### **Referee for**

- Nature, Science, Cell, Immunity, Cell Host and Microbes, Science Signaling, Nature Immunol., J. Exp. Med., Immunity, Proc. Natl. Acad. Sci. USA, Eur. J. Immunol., J. Immunol., J. Clin. Invest., Blood and other journals,
- European Union, MRC (UK), Wellcome Trust (UK), Royal Society, Cancer Research UK, Irish National Research Funding Programme, Australian National Health and Medical Research Council, Italian Association for Cancer Research, BSF (Israel) as well as AFM, LNCC, ARC, INSERM, ANRS, ANR & INCa (France).

### **Invited speakers**

- More than 200 international meetings including Nobel Conferences, International Congresses of Immunology, Gordon conferences, Keystone meetings, EMBO Workshops, J. March conferences, Cell conferences, Nature conferences
- External lectures in more than 200 institutes.

### **Organization of 14 international meetings**

#### **Selected original publications**

1. Vivier E., Morin P., O'Brien C., Druker B., Schlossman S. F., Anderson P. Tyrosine phosphorylation of the FcγRIII(CD16):ζ complex in human natural killer cells. Induction by antibody dependent cytotoxicity but not by natural killing. **J. Immunol.** 1991; 146:206-10.
2. Vivier E., Sorrell J. M., Ackerly M., Robertson M. J., Rasmussen R. A., Levine H., Anderson P. Developmental regulation of a natural killer cell-specific mucin-like glycoprotein. **J. Exp. Med.** 1993; 178:2023-33.
3. Vignaux F., Vivier E., Malissen B., Depraetere V., Nagata S., Golstein P. TCR/CD3 coupling to Fas-based cytotoxicity. **J. Exp. Med.** 1995; 181:781-86.
4. Luesher I. F., Vivier E., Laver A., la Loue A., Godeau F., Malissen B., Romero P. CD8 modulation of T-cell antigen receptor-ligand interactions on living cytotoxic T lymphocytes. **Nature** 1995; 373:353-56.

5. Malissen M., Gillet A., Ardouin L., Bouvier G., Trucy J., Ferrier P., Vivier E., Malissen B. Altered T cell development in mice with a targeted mutation of the CD3 $\epsilon$  gene. **EMBO. J.** 1995; 14:4641-4653.
6. Olcese L., Lang P., Vély F., Cambiaggi A., Marguet D., Bléry M., Hippen K. L., Biassoni R., Moretta A., Moretta L., Cambier J. C., Vivier E. Human and mouse natural killer cell inhibitory receptors recruit the PTP1C and PTP1D protein tyrosine phosphatases. **J. Immunol. Cutting Edge** 1996; 156:4531-4534.
7. Bléry M., Delon J., Trautmann A., Cambiaggi A., Olcese L., Biassoni R., Moretta L., Chavrier P., Moretta A., Daëron M., Vivier E. Reconstituted killer-cell inhibitory receptors for MHC class I molecules control mast cell activation induced via immunoreceptor tyrosine-based activation motifs. **J. Biol. Chem.** 1997; 272:8989-8996.
8. Olcese L., Cambiaggi A., Bottino C., Moretta A., Vivier E. Human killer-cell activatory receptors for MHC class I molecules are included in a multimeric complex expressed by natural killer cells. **J. Immunol. Cutting Edge** 1997; 158:5083-5086.
9. Cambiaggi A., Verthuy C., Naquet P., Romagné F., Ferrier P., Biassoni R., Moretta A., Moretta L. and Vivier E. NK-cell acceptance of H-2 mismatch bone-marrow grafts in transgenic mice expressing HLA-Cw3 specific killer-cell inhibitory receptor (CD158b). **Proc. Natl. Acad. Sci. USA.** 1997; 94:8088-8092.
10. Bléry M., Kubagawa H., Chen C-C., Vély F., Cooper M. D., Vivier E. The paired Ig-like receptor PIR-B is an inhibitory receptor that recruits the protein-tyrosine phosphatase SHP-1. **Proc. Natl. Acad. Sci. USA.** 1998; 95: 2446-2451.
11. Cambiaggi A., Darce S., Guia S., Kourilsky P., Abastado J-P., Vivier E. Modulation of T cell functions in KIR2DL3 (CD158b) transgenic mice. **Blood**, 1999, 94: 2396-2402.
12. André P., Spertini O., Guia S., Rihet P., Dignat-George F., Brailly H., Sampol J., Anderson P. J., Vivier E. Modification of PSGL-1 with an NK cell-restricted sulfated lactosamine creates an alternate ligand for L-selectin. **Proc. Natl. Acad. Sci. USA.** 2000, 97: 3400-3405.
13. Tomasello E., Desmoulins P. O., Chemin K., Guia S., Cremer H., Ortaldo J. R., Love P., Kaiserlian D., Vivier E. Combined Natural Killer Cell and Dendritic Cell Functional Deficiency in KARAP/DAP12 Loss-of-Function Mutant Mice. **Immunity** 2000, 13:345-353.
14. Ugolini S., Arpin C., Anfossi N., Walzer T., Cambiaggi A., Förster R., Lipp M., Toes R. E. M., Melief C. J., Marvel J., Vivier E. Involvement of inhibitory NKRs in the survival of a subset of memory-phenotype CD8<sup>+</sup> T cells. **Nature Immunology.** 2001, 2: 430-435.
15. Uehara T., Bléry M., Kang D-W., Chen C-C., Ho L. H., Gartland G. L., Liu F-T., Vivier E., Cooper M. D., Kubagawa H. Inhibition of IgE-mediated mast cell activation by the paired immunoglobulin-like receptor PIR-B. **J. Clin. Invest.**, 2001, 108: 1041-1050.
16. Sjölin H., Tomasello E., Mousavi-Jazi M., Bartolazzi A., Kärre K., Vivier E., Cerboni C. Pivotal role of KARAP/DAP12 adaptor molecule in the resistance to murine cytomegalovirus. **J. Exp. Med.** 2002, 195:825-834.
17. Colucci F., Schweighoffer E., Tomasello E., Turner M., Ortaldo J. R., Vivier E., Tybulewicz V., Di Santo J. Natural cytotoxicity uncoupled from the Syk and ZAP-70 intracellular kinases. **Nature Immunology** 2002, 3:288-294.
18. Diefenbach A., Tomasello E., Lucas M., Jamieson A. M., Hsia J., Vivier E.\*, Raulet DH\*. Selective associations with signaling proteins determine stimulatory versus costimulatory activity of NKG2D. **Nature Immunology** 2002, 3:1142-1149.
19. Saulquin X., Gastinel L., Vivier E. Crystal structure of the human natural killer cell activating receptor, KIR2DS2 (CD158j). **J. Exp. Med.** 2003, 197 :933-938.

20. Coudert J., Zimmer J., Tomasello E., Cebecauer M., Colonna M., Vivier E., Held W. Altered NKG2D function in NK cells induced by chronic exposure to NKG2D-ligand expressing tumor cells. **Blood**. 2005. 106: 1711-1717.
21. Stewart C. A., Laugier-Anfossi F., Vély F., Saulquin X., Tisserant A., Gauthier L., Romagné F., Ferracci G., Moretta A., Sun P., Ugolini S., Vivier E. Recognition of peptide-MHC class I complexes by activating Killer Ig-like Receptors. **Proc. Natl. Acad. Sci. USA**. 2005. 102: 13224-13229.
22. Baratin M., Roetyncq S., Lépolard C., Falk C., Sawadogo S., Uematsu S., Akira S., Ryffel B., Tiraby J-G., Alexopoulou L., Kirschning C. J., Gysin J., Vivier E.\*, Ugolini S\*. Natural Killer cell and Macrophage cooperation in MyD88-dependent innate responses to *Plasmodium falciparum*. **Proc. Natl. Acad. Sci. USA**. 2005, 102: 14747–14752
23. Chiesa S., Mingueneau M., Fuseri N., Malissen B., Raulet D. H., Malissen M., Vivier E.\*, Tomasello E\*. Multiplicity and plasticity of Natural Killer cell signaling pathways. **Blood**, 2006. 107: 2364-237.
24. Anfossi N., André P., Guia S., Falk C., Stewart C. A., Bresó V., Roetyncq S., Frassati C., Reviron D., Middleton D., Romagné F., Ugolini S., Vivier E. Human NK cell education by inhibitory receptors for MHC class I. **Immunity**, 2006, 25: 331-42.
25. Walzer T, Bléry M., Chaix J., Fuseri N., Chasson C., Robbins S. H., Jaeger S., André P., Gauthier L., Daniel L., Chemin K., Morel Y., Dalod M., Imbert J., Pierres M., Moretta A., Romagné F., Vivier E. Identification, activation and selective *in vivo* ablation of mouse NK cells via NKp46. **Proc. Natl. Acad. Sci. USA**. 2007, 104: 3384-3389.
26. Crozat K., Hoebe K., Ugolini S., Hong N., Janssen E., Rutschmann S., Mudd S., Sovath S., Vivier E., Beutler B. *Jinx*, an MCMV susceptibility phenotype caused by disruption of *Unc13d*: a mouse model of type 3 familial hemophagocytic lymphohistiocytosis. **J. Exp. Med.** 2007. 204 853-863.
27. Zhang S-Y., Jouanguy E., Ugolini S., Smahi A., Elain G., Romero P., Segal D., Sancho-Shimizu V., Lorenzo L., Puel A., Picard C., Chappier A., Plancoulaine S., Titeux M., Cognet C., von Bernuth H, Ku CL, Casrouge A, Zhang XX, Barreiro L, Leonard J, Hamilton C, Lebon P, Héron B, Vallée L, Quintana-Murci L, Hovnanian A, Rozenberg F, Vivier E., Geissmann F, Tardieu M, Abel L, Casanova JL. **Science**. 2007. 317: 1522-1527.
28. Walzer T., Chiossone L., Chaix L., Calver A., Carozzo C., Garrigue-Antar L., Jacques Y., Baratin M., Tomasello E., Vivier E. Natural killer cell trafficking *in vivo* requires a dedicated sphingosine 1-phosphate receptor. **Nature Immunology**. 2007. 8: 1337-1344.
29. Guia S., Cognet C., de Beaucoudrey L., Tessmer M.S., Jouanguy E., Berger C., Filipe-Santos O., Feinberg J., Camcioglu Y., Levy J., Al Jumaah S., Stephan JL., Fieschi C., Abel L., Brossay L., Casanova JL., Vivier E. A role for interleukin-12/-23 in the maturation of human Natural Killer and CD56<sup>+</sup> T cells *in vivo* **Blood** 2008. 111:5008-16.
30. Helming L., Tomasello E., Kyriakides T. R., Martinez F.O., Takai T., Gordon S. and Vivier E. Essential Role of DAP12 Signaling in Macrophage Programming into a Fusion-Competent State. **Science Signaling** 2008 1, ra11
31. Luci C., Reynders A., Ivanov I.I., Cognet C., Chiche L., Chasson L., Hardwigsen J., Anguiano E., Banchereau J., Chaussabel D., Dalod M., Littman D.R., Vivier E.\*, Tomasello E\*. Influence of the transcription factor ROR $\gamma$ t on the development of NKp46<sup>+</sup> cell populations in gut and skin. **Nature Immunology** 2009 10:75-82.
32. Brandt CS., Baratin M., Yi EC., Kennedy J., Gao Z., Fox B., Haldeman B., Ostrander CD., Kaifu T., Chabannon C., Moretta A., West R., Xu WF., Vivier E.\*, Levin SD\*. The

- B7 Family Member B7-H6 is a tumor cell ligand for the activating Natural Killer cell receptor NKp30 in humans. **J. Exp. Med.** 2009. 206:1495-503
33. Sola C., André P., Lemmers C., Fuseri N., Bonnafous C., Bléry M., Wagtmann N.R., Romagné F., Vivier E.\*, Ugolini S\*. Genetic and antibody-mediated reprogramming of natural killer cell missing-self recognition *in vivo*. **Proc. Natl. Acad. Sci. USA.** 2009. 106: 12879-12884.
  34. Chauveau A., Aucher A., Eissmann P., Vivier E., Davis D.M. Membrane nanotubes facilitate long distance interactions between Natural Killer cells and target cells. **Proc. Natl. Acad. Sci. USA.** 2010. 107: 5545-5550
  35. Guia S., Jaeger B.N., Piatek S., Mailfert S., Trombik T., Fenis A., Chevrier N., Walzer T., Kerdiles Y.M., Marguet D., Vivier E.\*, Ugolini S\*. Activating receptor confinement at the plasma membrane controls Natural Killer cell tolerance. **Science Signaling**, 2011, 4:ra21.
  36. Reynders A., Yessaad N., Vu Manh T.P., Dalod M., Fenis A., Aubry C., Nikitas G., Escalière B., Renauld J.C., Dussurget O., Cossart P., Lecuit M., Vivier E.\*, Tomasello E\*. Differential function of NKp46<sup>+</sup>ROR $\gamma$ t<sup>+</sup> and NKp46<sup>+</sup>ROR $\gamma$ t<sup>-</sup> gut lymphoid cells. **EMBO J.** 2011, 30:2934-47.
  37. Narni-Mancinelli E., Chaix J., Fenis A., Yessad N., Reynders A., Grégoire C., Ugolini S., Tomasello E., Walzer T., Vivier E. Fate mapping analysis of lymphoid cells expressing the NKp46 cell surface receptor. **Proc. Natl. Acad. Sci. USA.** 2011, 108: 18324–18329.
  38. Narni-Mancinelli E., Jaeger B.N., Bernat C., Fenis A., Kung S., De Gassart A., Mahmood S., Gut M., Heath S., Estellé J., Bertosio E., Vély F., Gastinel L.N., Beutler B., Malissen B., Malissen M., Gut I.G., Vivier E.\*, Ugolini S\*. Tuning of Natural Killer Cell Reactivity by NKp46 and Helios Calibrates T Cell Responses. **Science**, 2012, 335: 344-348.
  39. Jaeger B.N., Donadieu J., Cognet C., Ordoñez-Rueda D., Bernat C., Barlogis V., Malhaoui N., Fenis A., Beaupain B., Bellanné-Chantelot C., Bajénoff M., Malissen B., Malissen M., Vivier E.\*, Ugolini S\*. Neutrophil depletion impairs natural killer cell maturation, function, and homeostasis. **J. Exp. Med.** 2012, 209: 565-580.
  40. Gineau L., Cognet C., Kara N., Lack F., Dunne J., Veturi U., Picard C., Trouillet C., Eidenschenck C., Aoufouchi S., Alcais A., Smith O., Geissmann F., Feighery C., Abel L., Smogorzewska A., Stillman B., Vivier E., Casanova J.L., Jouanguy E. Partial MCM4 deficiency in patients with growth retardation, adrenal insufficiency and natural killer cell deficiency. **J. Clin. Invest.** 2012, 122: 821-32.
  41. Matta J., Baratin M., Chiche L., Forel J-M., Cognet C., Thomas G., Farnarier C., Papazian L., Chaussabel D., Ugolini S., Vély F., Vivier E. Involvement of B7-H6, a ligand for the Natural Killer cell activating receptor NKp30, in inflammatory conditions. **Blood.** 2013, 122: 394-404.
  42. Biroccio A., Cherfils-Vicini J., Augereau A., Pinte S., Bauwens S., Ye J., Simonet T., Horard B., Jamet K., Cervera L., Mendez-Bermudez A., Poncet D., Grataroli R., T'kint de Rodenbeeke C., Salvati E., Rizzo A., Zizza P., Ricoul M., Cognet C., Kulman T., Duret H., Lépinasse F., Marvel J., Verhoeyen E., Cosset F-L., Peeper D., Smyth M.J., Londoño-Vallejo A., Sabatier L., Picco V., Pages G., Scoazec J-Y., Stoppacciaro A., Leonetti C., Vivier E., and Gilson E.. TRF2 inhibits a cell-extrinsic pathway through which Natural Killer cells eliminate cancer cells. **Nature Cell. Biol.** 2013, 15: 818–828.
  43. Viaud S, Saccheri F, Mignot G, Yamazaki T, Daillère R, Hannani D, Enot DP, Pfirschke C, Engblom C, Pittet MJ, Schlitzer A, Ginhoux F, Apetoh L, Chachaty E, Woerther PL, Eberl G, Bérard M, Ecobichon C, Clermont D, Bizet C, Gaboriau-Routhiau V, Cerf-Bensussan N, Opolon P, Yessaad N, Vivier E., Ryffel B, Elson CO,

- Doré J, Kroemer G, Lepage P, Boneca IG, Ghiringhelli F, Zitvogel L. The intestinal microbiota modulates the anticancer immune effects of cyclophosphamide. **Science**. 2013, 342:971-6.
44. Speak A.O., Taylor te Vruchte D., Davis L.C., Morgan A. J., Smith D.A., Yanjanin N.M., Simmons L., Hartung R., Runz H., Mengel E., Beck M., Imrie J., Jacklin E., Wraith J.E., Hendriksz C., Lachman R., Cagnet C., Sidhu R., Fujiwara H., Ory D.S., Galione A., Porter F.D., Vivier E., Platt F.M. Altered distribution and function of Natural Killer cells in murine and human Niemann-Pick disease type C1. **Blood**, 2013 123: 51-60.
  45. Firth M.A., Madera S., Beaulieu A.M., Gasteiger G., Castillo E.F., Schluns K.S., Kubo M., Rothman P.B., Vivier E., Sun J.C. Nfil3-independent lineage maintenance of natural killer cells. **J. Exp. Med.** 2013, 210: 2981-2990.
  46. Crouse J., Bedenikovic G., Wiesel M., Ibberson M., Xenarios I., Von Laer D., Kalinke U., Vivier E., Jonjic S., Oxenius A. Type I Interferons Protect T Cells against NK Cell Attack Mediated by the Activating Receptor NCR1. **Immunity**, 2014, 40: 961-973.
  47. Marçais A., Cherfils-Vicini J.<sup>+</sup>, Viant C<sup>+</sup>, Degouve S., Viel S., Fenis A., Rabilloud J., Mayol K., Tavares A., Bienvenu J., Gangloff Y-G., Gilson E., Vivier E., Walzer T. The metabolic checkpoint kinase mTOR is essential for IL-15 signaling during development and activation of NK cells. **Nature Immunology**, 2014, 15:749-57.
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Eric Vivier et Marc Daëron  
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- NK cell subsets in health and disease: new developments  
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**Summary of the main scientific achievements**

- (1) Characterization of the family of ITIM-bearing receptors; mode of action of activating and inhibitory receptors expressed on NK cells,
- (2) Generation of original animal models to analyze NK cell fate and functions in vivo,
- (3) Analysis of NK cell development and dissection of the process of NK cell “education”,
- (4) Participation to the identification of Innate Lymphoid Cells,
- (5) Co-development of therapeutic antibodies with Innate-Pharma, presently in trials in various cancers
- (6) Co-generation of the Discontinuity Theory of Immunity