**I) Main University degrees**

**Bruno CANQUE – Curriculum Vitae – January 2023**

- Diplôme de Médecine Tropicale : Université René Descartes, Paris V, Faculté de Médecine Cochin (1988).

- Doctorat en Médecine. thesis : (1992)

- Doctorat en Sciences. Thesis : (1996).

- Habilitation à Diriger les Recherches. thesis (2005)

**II) Research position**

- Professor (1st class) École Pratique des Hautes Études, Paris

- Director of the “Lymphoid Development team“ (UMR 976, IRSL, Paris, France).

**III) Thesis supervision**

- Direction of nine PhD theses (one in progress)

**IV) Recently founded projects**

- Leader of the ANR project EpiDev (2019).

- Partner of the INCA project B-REC (2019)

**V) Research topics**

The Lymphoid Development team headed by Bruno CANQUE at the IUH is working on the early stages of human lymphopoiesis. They have identified the long sought fetal thymus-colonizing cells, the so-called prothymocytes, and shown that this population is subjected to developmental regulation since it is detected during the second trimester of development and persists at only trace levels after birth. Over the last years, using an original modeling approach in humanized mice, CANQUE’s team has focused on the architecture of human hematopoiesis which led to establishment of an integrated developmental roadmap of hematopoiesis and to propose a revised two-family model of lymphoid development. The research axes currently developed by the CANQUE’s team move in 2 directions: (i) analyzing the regulatory networks governing hematopoietic diversification; (ii) developing humanized models of leukemogenic transformation for basic and preclinical studies.

**VI) Main scientific contributions:**

- Haddad, R., Guimiot, F., (….) and Canque, B. (2006). Dynamics of thymus-colonizing cells during human development. Immunity 24, 217-230.

- Alhaj Hussen, K., Vu Manh,T., (…) and Canque, B. (2017) Molecular and Functional Characterization of Lymphoid Progenitor Subsets Reveals a Bipartite Architecture of Human Lymphopoiesis. Immunity 47, 680-696

**I) Articles**

**Bruno CANQUE – Publications**

1. Sabolovic, D., Berbiguier, N., **Canque, B.**, and Galey, L. (1991). Stage-dependent alteration of negative charges of uninfected erythrocytes in Plasmodium falciparum culture. *In Vitro Cell Dev Biol 27A*, 595-596.

2. **Canque, B.** (1992). [Involvement of cellular immunity in pathology. Neuromalaria]. *Bull Soc Pathol Exot 85*, 142-145.

3. Trape, J. F., Rogier, C., Konate, L., Diagne, N., Bouganali, H., **Canque, B.**, Legros, F., Badji, A., Ndiaye, G., Ndiaye, P., and et al. (1994). The Dielmo project: a longitudinal study of natural malaria infection and the mechanisms of protective immunity in a community living in a holoendemic area of Senegal. *Am J Trop Med Hyg 51*, 123-137.

4. Marandin, A., **Canque, B.**, Coulombel, L., Gluckman, J. C., Vainchenker, W., and Louache, F. (1995). In vitro infection of bone marrow-adherent cells by human immunodeficiency virus type 1 (HIV-1) does not alter their ability to support hematopoiesis. *Virology 213*, 245-248.

5. **Canque, B.**, Marandin, A., Rosenzwajg, M., Louache, F., Vainchenker, W., and Gluckman, J. C. (1995a). Susceptibility of human bone marrow stromal cells to human immunodeficiency virus (HIV). *Virology 208*, 779-783.

6. **Canque, B.**, Rosenswajg, M., and Gluckman, J. C. (1995b). HIV replication and lack of alteration of phytohemagglutinin-induced lymphokine production by peripheral blood mononuclear cells. *J Acquir Immune Defic Syndr Hum Retrovirol 9*, 204-206.

7. **Canque, B.**, Rosenzwajg, M., Camus, S., Yagello, M., Bonnet, M. L., Guigon, M., and Gluckman, J. C. (1996a). The effect of in vitro human immunodeficiency virus infection on dendritic-cell differentiation and function. *Blood 88*, 4215-4228.

8. **Canque, B.**, Rosenzwajg, M., Gey, A., Tartour, E., Fridman, W. H., and Gluckman, J. C. (1996b). Macrophage inflammatory protein-1alpha is induced by human immunodeficiency virus infection of monocyte-derived macrophages. *Blood 87*, 2011-2019.

9. Rosenzwajg, M., **Canque, B.**, and Gluckman, J. C. (1996). Human dendritic cell differentiation pathway from CD34+ hematopoietic precursor cells. *Blood 87*, 535-544.

10. **Canque, B.**, Rosenzwajg, M., Camus, S., Yagello, M., Guigon, M., and Gluckman, J. C. (1997). In vitro HIV infection of dendritic cell precursors. Effect on dendritic cell differentiation and function. *Adv Exp Med Biol 417*, 407-410.

11. Gluckman, J. C., **Canque, B.**, Chapuis, F., and Rosenzwajg, M. (1997). In vitro generation of human dendritic cells and cell therapy. *Cytokines Cell Mol Ther 3*, 187-196.

12. Gluckman, J. C., **Canque, B.**, and Rosenzwajg, M. (1998). [Dendritic cells: a complex cellular system]. *Transfus Clin Biol 5*, 47-55.

13. **Canque, B.**, Camus, S., Yagello, M., and Gluckman, J. C. (1998a). IL-4 and CD40 ligation affect differently the differentiation, maturation, and function of human CD34(+) cell-derived CD1a(+)CD14(-) and CD1a(-)CD14(+) dendritic cell precursors in vitro. *J Leukoc Biol 64*, 235-244.

14. **Canque, B.**, Camus, S., Yagello, M., and Gluckman, J. C. (1998b). Special susceptibility to apoptosis of CD1a(+) dendritic cell precursors differentiating from cord blood CD34(+) progenitors. Stem Cells *16*, 218-228.

15. Dalloul, A. H., Patry, C., Salamero, J., **Canque, B.**, Grassi, F., and Schmitt, C. (1999). Functional and phenotypic analysis of thymic CD34(+)CD1a(-) progenitor-derived dendritic cells: predominance of CD1a(+) differentiation pathway. J Immunol *162*, 5821-5828.

16. **Canque, B.**, Bakri, Y., Camus, S., Yagello, M., Benjouad, A., and Gluckman, J. C. (1999). The susceptibility to X4 and R5 human immunodeficiency virus-1 strains of dendritic cells derived in vitro from CD34(+) hematopoietic progenitor cells is primarily determined by their maturation stage. *Blood 93*, 3866-3875.

17. **Canque, B.**, Camus, S., Dalloul, A., Kahn, E., Yagello, M., Dezutter-Dambuyant, C., Schmitt, D., Schmitt, C., and Gluckman, J. C. (2000). Characterization of dendritic cell differentiation pathways from cord blood CD34(+)CD7(+)CD45RA(+) hematopoietic progenitor cells. *Blood 96*, 3748-3756.

18. Schmitt, C., Fohrer, H., Beaudet, S., Palmer, P., Alpha, M. J., **Canque, B.**, Gluckman, J. C., and Dalloul, A. H. (2000). Identification of mature and immature human thymic dendritic cells that differentially express HLA-DR and interleukin-3 receptor in vivo. *J Leukoc Biol 68*, 836-844.

19. Bakri, Y., Schiffer, C., Zennou, V., Charneau, P., Kahn, E., Benjouad, A., Gluckman, J. C., and **Canque, B.** (2001). The maturation of dendritic cells results in postintegration inhibition of HIV-1 replication. *J Immunol 166*, 3780-3788.

20. **Canque, B.**, and Gluckman, J. C. (2001). Toward a unified theory of dendritic-cell diversity. *Trends Immunol 22*, 664.

21. Gluckman, J. C., **Canque, B.**, and Rosenzwajg, M. (2002). Dendritic cells: a complex simplicity. *Transplantation 73*, S3-6.

22. Prost, S., LeDiscorde, M., Haddad, R., Gluckman, J. C., **Canque, B.**, and Kirszenbaum, M. (2002). Characterization of a novel hematopoietic marker expressed from early embryonic hematopoietic stem cells to adult mature lineages. *Blood Cells Mol Dis 29*, 236-248.

23. **Canque, B.**, Rosenzwajg, M., and Gluckman, J. C. (2003). In vitro generation of dendritic cells from cord blood CD34+ hematopoietic progenitor cells. *Methods Mol Biol 215*, 311-325.

24. Haddad, R., Guardiola, P., Izac, B., Thibault, C., Radich, J., Delezoide, A. L., Baillou, C., Lemoine, F. M., Gluckman, J. C., Pflumio, F., and **Canque, B.** (2004). Molecular characterization of early human T/NK and B-lymphoid progenitor cells in umbilical cord blood. *Blood 104*, 3918-3926.

25. Schiffer, C., Lecellier, C. H., Mannioui, A., Felix, N., Nelson, E., Lehmann-Che, J., Giron, M. L., Gluckman, J. C., Saib, A., and **Canque, B.** (2004). Persistent infection with primate foamy virus type 1 increases human immunodeficiency virus type 1 cell binding via a Bet-independent mechanism. *J Virol 78*, 11405-11410.

26. Mannioui, A., Schiffer, C., Felix, N., Nelson, E., Brussel, A., Sonigo, P., Gluckman, J. C., and **Canque, B.** (2004). Cell cycle regulation of human immunodeficiency virus type 1 integration in T cells: antagonistic effects of nuclear envelope breakdown and chromatin condensation. *Virology 329*, 77-88.

27. Mannioui, A., Nelson, E., Schiffer, C., Felix, N., Le Rouzic, E., Benichou, S., Gluckman, J. C., and **Canque, B.** (2005). Human immunodeficiency virus type 1 KK26-27 matrix mutants display impaired infectivity, circularization and integration but not nuclear import. *Virology 339*, 21-30.

28. Burleigh, L., Lozach, P. Y., Schiffer, C., Staropoli, I., Pezo, V., Porrot, F., **Canque, B.**, Virelizier, J. L., Arenzana-Seisdedos, F., and Amara, A. (2006). Infection of dendritic cells (DCs), not DC-SIGN-mediated internalization of human immunodeficiency virus, is required for long-term transfer of virus to T cells. *J Virol 80*, 2949-2957.

29. Haddad, R., Guimiot, F., Six, E., Jourquin, F., Setterblad, N., Kahn, E., Yagello, M., Schiffer, C., Andre-Schmutz, I., Cavazzana-Calvo, M.*,* Delezoide, A. L.,Gluckman, J. C., Pflumio, F., and **Canque, B.** (2006). Dynamics of thymus-colonizing cells during human development. *Immunity 24*, 217-230.

30. Parcelier, A., Maharzi, N., Delord, M., Robledo-Sarmiento, M., Nelson, E., Belakhdar-Mekid, H., Pla, M., Kuranda, K., Parietti, V., Goodhardt, M.*,* M., Gluckman JC, Pflumio F, and **Canque B** (2011). AF1q/MLLT11 regulates the emergence of human prothymocytes through cooperative interaction with the Notch signaling pathway. *Blood* 118, 1784-96.

31. Parietti, V., Nelson E., Telliam G., Le Noir S., Pla M., Delord M., Vanneaux V., Mohtashami M., Macintyre E., Gluckman JC., Asnafi V., Zuniga-Pflücker JC., Larghero L., and **Canque B**. Dynamics of Human Prothymocytes and Xenogeneic Thymopoiesis in Hematopoietic Stem Cell-Engrafted NOD-SCID/IL2rGnull Mice. *J. Immunol* 189, 1648-1660.

32. Maharzi, N., V. Parietti, E. Nelson, S. Denti, M. Robledo-Sarmiento, N. Setterblad, A. Parcelier, M. Pla, F. Sigaux, J.C. Gluckman, and **B. Canque**. 2013. Identification of TMEM131L as a Novel Regulator of Thymocyte Proliferation in Humans. *J Immunol* 190:6187-6197.

33. Szuplewski, S., Maharzi, N., Nelson, E., Alhaj Hussen, K., Mignotte, B., Guenal, I., and **Canque, B**. (2017). Evolutionary conservation of Notch signaling inhibition by TMEM131L overexpression. *Biochem Biophys Res Commun* 486, 909-915.

34. Alhaj Hussen, K., Vu Manh,T., Guimiot, F., Nelson, E., Chabaane, E., Delord, M., Barbier, M., Berthault, C., Dulphy, N., Alberdi, A., Burlen-Defranoux, O., Socié, G., Bories, J.C., Larghero, J., Vanneaux, V., Verhoeyen, E., Wirth, T., Dalod, M., Gluckman, J.C., Cumano, A, **Canque, B**. (2017) Molecular and Functional Characterization of Lymphoid Progenitor Subsets Reveals a Bipartite Architecture of Human Lymphopoiesis. *Immunity* 47, 680-696.

35. Alhaj Hussen, K., E., Chabaane, E., **Canque, B**. (2018) Organisation bipartite de la lymphopoïèse humaine. *Med Sci (Paris)* 34, 665-670.

36. Alhaj Hussen, K., Michonneau, D., Biajoux, V., Keita, S., Dubouchet, L., Nelson, E., Setterblad, N., Le-Buanec, L., Bouaziz, J.D., Guimiot, F., Socié, G., and Canque, B. (2020). CD4+CD8+ T-Lymphocytes in xenogeneic and human Graft-versus-Host Disease. Frontiers Immunol doi: 103389/fimmu.2020.579776

37. Keita, S., Diop, S., Lekiashvili, S., Chabaane, E., Nelson, E., Strullu, M., Arfeuille, C., Guimiot, F., Domet, T., Duchez, S., (...) and **Canque, B**. (2023). Distinct subsets of multi-lymphoid progenitors support ontogeny-related changes in human lymphopoiesis. Cell Rep *42*, 112618. 10.1016/j.celrep.2023.112618.

38. Alhaj Hussen, K., Chabaane, E., Nelson, E., Lekiashvili,S., Diop, S., Keita, S., Evrard, B., (…) and Bruno Canque.Multimodal Cartography of Human Lymphopoiesis Reveals B and T/NK/ILC Lineages are Subjected to Differential Regulation. (2023). IScience, 26, 107890. 10.1016/j.isci.2023.107890

**II) Edited volumes**

1. **Canque B**, Rosenzwajg M, Gluckman JC. (2003). In vitro generation of dendritic cells from cord blood CD34+ hematopoietic progenitor cells. In "Methods in molecular biology, volume 215. Cytokines and colony stimulating factors: methods and protocols" (D. Körholz, W. Kiess eds), Humana Press, Totowa, New Jersey, pp 311-325.

2. Gluckman JC, **Canque B**. (2004). Dendritic cell and lymphoid progenitors in cord blood. In "Cell characteristics of cord blood and cord blood transplantation" second edition (H.E. Broxmeyer, ed), AABB press, Bethesda, Maryland.

3. Ezine, S., Gautreau, L., Parcelier A., **Canque, B**. (2009) Developmental Biology of Mammalian T-Cell Progenitors: From Early Lymphoid Progenitors to Thymus-Colonizing Cells. In "Hematopoietic Stem Cell Biology". Motonari Kondo. Editor 83-116.