**ADOLFO FERRANDO**

**Overview**

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**Academic Appointments**

* Professor of Pediatrics, Pathology & Cell Biology

**Administrative Appointments**

* Associate Director for Shared Resources, Herbert Irving Comprehensive Cancer Center

**Research**

The research program in the Ferrando lab combines genomics, biochemical, genetic and experimental therapeutics approaches towards the identification of novel therapies for the treatment of high-risk leukemias and lymphomas. His laboratory has played major roles in the functional analysis of oncogenic NOTCH1 and the TLX1 and TLX3 oncogenes in the pathogenesis of T-ALL. In addition, he has identified and functionally characterized numerous genes somatically mutated in this disease including PTEN, WT1, PHF6, BCL11B, ETV6, EZH2 and NT5C2 as well as in peripheral T-cell lymphomas. Identifying and targeting major leukemia driver oncogenes by leveraging mouse models and forward genomics and deciphering the basic mechanisms underlying leukemic transformation and drug resistance are major areas of active research in the Ferrando lab.

**Selected Publications**

1. **GATA3-Controlled Nucleosome Eviction Drives MYC Enhancer Activity in T-cell Development and Leukemia**Belver L, Yang AY, Albero R, Herranz D, Brundu FG, Quinn SA, Pérez-Durán P, Álvarez S, Gianni F, Rashkovan M, Gurung D, Rocha PP, Raviram R, Reglero C, Cortés JR, Cooke AJ, Wendorff AA, Cordó V, Meijerink JP, Rabadan R, Ferrando AA  
   Cancer Discov. 2019.  
   PMID: 31519704, DOI: 10.1158/2159-8290.CD-19-0471
2. **Phf6 Loss Enhances HSC Self-Renewal Driving Tumor Initiation and Leukemia Stem Cell Activity in T-ALL**Wendorff AA, Quinn SA, Rashkovan M, Madubata CJ, Ambesi-Impiombato A, Litzow MR, Tallman MS, Paietta E, Paganin M, Basso G, Gastier-Foster JM, Loh ML, Rabadan R, Van Vlierberghe P, Ferrando AA  
   Cancer Discov. 2019.  
   PMID: 30567843, DOI: 10.1158/2159-8290.CD-18-1005
3. **Oncogenic hijacking of the stress response machinery in T cell acute lymphoblastic leukemia**Kourtis N, Lazaris C, Hockemeyer K, BalandrÃ¡n JC, Jimenez AR, Mullenders J, Gong Y, Trimarchi T, Bhatt K, Hu H, Shrestha L, Ambesi-Impiombato A, Kelliher M, Paietta E, Chiosis G, Guzman ML, Ferrando AA, Tsirigos A, Aifantis I  
   Nat Med. 2018.  
   PMID: 30038221, DOI: 10.1038/s41591-018-0105-8
4. **Structure and Mechanisms of NT5C2 Mutations Driving Thiopurine Resistance in Relapsed Lymphoblastic Leukemia**Dieck CL, Tzoneva G, Forouhar F, Carpenter Z, Ambesi-Impiombato A, Sánchez-Martín M, Kirschner-Schwabe R, Lew S, Seetharaman J, Tong L, Ferrando AA  
   Cancer Cell. 2018.  
   PMID: 29990496, DOI: 10.1016/j.ccell.2018.06.003
5. **Clonal evolution mechanisms in NT5C2 mutant-relapsed acute lymphoblastic leukaemia**Tzoneva G, Dieck CL, Oshima K, Ambesi-Impiombato A, Sánchez-Martín M, Madubata CJ, Khiabanian H, Yu J, Waanders E, Iacobucci I, Sulis ML, Kato M, Koh K, Paganin M, Basso G, Gastier-Foster JM, Loh ML, Kirschner-Schwabe R, Mullighan CG, Rabadan R, Ferrando AA  
   Nature. 2018.  
   PMID: 29342136, DOI: 10.1038/nature25186
6. **Metabolic reprogramming induces resistance to anti-NOTCH1 therapies in T cell acute lymphoblastic leukemia**Herranz D, Ambesi-Impiombato A, Sudderth J, Sánchez-Martín M, Belver L, Tosello V, Xu L, Wendorff AA, Castillo M, Haydu JE, Márquez J, Matés JM, Kung AL, Rayport S, Cordon-Cardo C, DeBerardinis RJ, Ferrando AA  
   Nat Med. 2015.  
   PMID: 26390244, DOI: 10.1038/nm.3955
7. **A NOTCH1-driven MYC enhancer promotes T cell development, transformation and acute lymphoblastic leukemia**Herranz D, Ambesi-Impiombato A, Palomero T, Schnell SA, Belver L, Wendorff AA, Xu L, Castillo-Martin M, Llobet-Navás D, Cordon-Cardo C, Clappier E, Soulier J, Ferrando AA  
   Nat Med. 2014.  
   PMID: 25194570, DOI: 10.1038/nm.3665
8. **Recurrent mutations in epigenetic regulators, RHOA and FYN kinase in peripheral T cell lymphomas**Palomero T, Couronné L, Khiabanian H, Kim MY, Ambesi-Impiombato A, Perez-Garcia A, Carpenter Z, Abate F, Allegretta M, Haydu JE, Jiang X, Lossos IS, Nicolas C, Balbin M, Bastard C, Bhagat G, Piris MA, Campo E, Bernard OA, Rabadan R, Ferrando AA  
   Nat Genet. 2014.  
   PMID: 24413734, DOI: 10.1038/ng.2873
9. **Direct reversal of glucocorticoid resistance by AKT inhibition in acute lymphoblastic leukemia**Piovan E, Yu J, Tosello V, Herranz D, Ambesi-Impiombato A, Da Silva AC, Sanchez-Martin M, Perez-Garcia A, Rigo I, Castillo M, Indraccolo S, Cross JR, de Stanchina E, Paietta E, Racevskis J, Rowe JM, Tallman MS, Basso G, Meijerink JP, Cordon-Cardo C, Califano A, Ferrando AA  
   Cancer Cell. 2013.  
   PMID: 24291004, DOI: 10.1016/j.ccr.2013.10.022
10. **Activating mutations in the NT5C2 nucleotidase gene drive chemotherapy resistance in relapsed ALL**Tzoneva G, Perez-Garcia A, Carpenter Z, Khiabanian H, Tosello V, Allegretta M, Paietta E, Racevskis J, Rowe JM, Tallman MS, Paganin M, Basso G, Hof J, Kirschner-Schwabe R, Palomero T, Rabadan R, Ferrando A  
    Nat Med. 2013.  
    PMID: 23377281, DOI: 10.1038/nm.3078
11. **Reverse engineering of TLX oncogenic transcriptional networks identifies RUNX1 as tumor suppressor in T-ALL**Della Gatta G, Palomero T, Perez-Garcia A, Ambesi-Impiombato A, Bansal M, Carpenter ZW, De Keersmaecker K, Sole X, Xu L, Paietta E, Racevskis J, Wiernik PH, Rowe JM, Meijerink JP, Califano A, Ferrando AA  
    Nat Med. 2012.  
    PMID: 22366949, DOI: 10.1038/nm.2610
12. **The TLX1 oncogene drives aneuploidy in T cell transformation**De Keersmaecker K, Real PJ, Gatta GD, Palomero T, Sulis ML, Tosello V, Van Vlierberghe P, Barnes K, Castillo M, Sole X, Hadler M, Lenz J, Aplan PD, Kelliher M, Kee BL, Pandolfi PP, Kappes D, Gounari F, Petrie H, Van der Meulen J, Speleman F, Paietta E, Racevskis J, Wiernik PH, Rowe JM, Soulier J, Avran D, Cavé H, Dastugue N, Raimondi S, Meijerink JP, Cordon-Cardo C, Califano A, Ferrando AA  
    Nat Med. 2010.  
    PMID: 20972433, DOI: 10.1038/nm.2246
13. **PHF6 mutations in T-cell acute lymphoblastic leukemia**Van Vlierberghe P, Palomero T, Khiabanian H, Van der Meulen J, Castillo M, Van Roy N, De Moerloose B, Philippé J, González-García S, Toribio ML, Taghon T, Zuurbier L, Cauwelier B, Harrison CJ, Schwab C, Pisecker M, Strehl S, Langerak AW, Gecz J, Sonneveld E, Pieters R, Paietta E, Rowe JM, Wiernik PH, Benoit Y, Soulier J, Poppe B, Yao X, Cordon-Cardo C, Meijerink J, Rabadan R, Speleman F, Ferrando A  
    Nat Genet. 2010.  
    PMID: 20228800, DOI: 10.1038/ng.542
14. **Gamma-secretase inhibitors reverse glucocorticoid resistance in T cell acute lymphoblastic leukemia**Real PJ, Tosello V, Palomero T, Castillo M, Hernando E, de Stanchina E, Sulis ML, Barnes K, Sawai C, Homminga I, Meijerink J, Aifantis I, Basso G, Cordon-Cardo C, Ai W, Ferrando A  
    Nat Med. 2009.  
    PMID: 19098907, DOI: 10.1038/nm.1900
15. **Mutational loss of PTEN induces resistance to NOTCH1 inhibition in T-cell leukemia**Palomero T, Sulis ML, Cortina M, Real PJ, Barnes K, Ciofani M, Caparros E, Buteau J, Brown K, Perkins SL, Bhagat G, Agarwal AM, Basso G, Castillo M, Nagase S, Cordon-Cardo C, Parsons R, Zúñiga-Pflücker JC, Dominguez M, Ferrando AA  
    Nat Med. 2007.  
    PMID: 17873882, DOI: 10.1038/nm1636