Prof. Rafael Carretero Coca, Ph.D.

Presentation

I am a scientist and preclinical pharmacologist with a strong background in cancer immunology and Immunotherapy. During my PhD and postdoctoral research, I characterized mechanisms of cancer resistance to immunotherapy and study Treg based immunotherapies. After it, I move to Bayer and worked as pharmacologist developing immune oncology compounds in the preclinical phase. Currently, I am the associated head of the Bayer/DKFZ joint immunotherapeutics laboratory. In this position I led a team of scientist with the focus of developing and optimizing immune assays (both in vitro and in vivo), Support projects with immune expertise, manage the portfolio and closely collaborate with DKFZ scientist. I am currently a PAD in the University of Granada, where I will continue my focus on the antitumoral immune response and translating scientific discoveries into drugs that helps patients.

Experience

2/2025-now	**Associated Proffesor** **University of Granada (ugr)**, Task: Teaching and research the immune response against cancer
6/2024-2/2025	**Manager of the DKFZ D3 for drug discovery** **German Cancer Research Center (DKFZ)**, Task: Oversee the Oncology portfolio
4/2016-6/2024	**Associated head of the Bayer/DKFZ joint immunotherapeutics laboratory** **Bayer Ag** Task: oversee I.O portfolio. Leader of a team of 5 scientist and 9 TAs
9/2015-4/2016	**Research scientist: Pharmacologist** **Bayer AG.** Task: Development of I.O therapies
8/2011-8/2015	**Postdoctoral researcher** **DKFZ** Topic: Cellular and molecular Characterization of tumor rejection

Education

9/2007-4/2011	**Ph.D. in Biology. Grade *(1.0)* (sobresaliente cum laude)** Universidad de Granada (UGR), Spain – Dept. of Biochemistry and Immunology (Prof. **Supervisor:** Dr. Federico Garrido) Thesis title: Tumor escape after immunotherapy: Implication of HLA class I molecules in melanoma and bladder cancer.
2009-2010	**National Institutes of Health (NIH).** Maryland, USA. **Supervisor:** Francesco M. Marincola.
9/2006-9/2007	**Master of Science. Grade (*9.53/10)*** Universidad de Granada (UGR), Spain – Dept. of Biochemistry and Immunology (Prof. **Supervisor:** Dr. Federico Garrido) Thesis title: Loss of HLA class I expression impairs the effect of autologous melanoma vaccination.
9/2001-7/2006	**Bachelor´s degree in Biology. Grade (*9.65/10)*** Universidad de Granada (UGR)

Drug development achivements

Clinical trial	**CEACAM6 antagonist** (NCT03596372) **AHR** inhibitor (NCT04069026) **DGKz** inhibitor (NCT05614102) **DGKa** (NCT05858164)
Lead optimization	IL4i1, MAP4K1, TIM-3, DR3
Lead identification	IRAK3, Cbl-b, IRE1a, Foxp3, CD96, SHP-I, CD73, P2YR2,
Target identification	CRISCas9 screen in myeloid cells, NR4i1, TNFAIP3, B3GNT5, ART1, S1PR4, CD6
Patents	WO2022167627A1 / WO2021249913A9 / WO2021074279A1 / WO2019101642A1 / WO2019101643A1 / WO2019016071A1 / WO2018228923A1 / WO2018228920A1 / WO2014096367A1 / ES2847162T3 / UY37813A / AR111034A1 / CA3074381A1 / EP3638669A1 / EP3638670B1 / CA3082857A1 / EP3894406A1 /

Teaching experience

Since 2018	**Associate professor in the master of cellular and molecular immunology**
Since 2015	Habilitation by the ANECA (Hired professor)
2009-2011	Teaching at the University of Granada (180 hour of lectures)
	205 hours of teaching experience

Research topics

Immune escape	Alterations in HLA and other molecules used by the tumor to avoid the immune system and the immunotherapies
Immunometabolism of cancer	Characterization of the singular metabolism of tumors and how the alter molecules affect the immune response against tumoral cells
Intracellular checkpoint inhibitors	Characterization and therapeutical approaches to target novel regulator of the immune response against cancer from T cells and innate cells
Drug discovery and development	Develop the scientific knowledge into drug discovery and development in the field of immunology

Granada, 01/04/2025

Anexo: list of publications (***highlighted publications)

1. ***Discovery of BAY-405: An Azaindole-Based MAP4K1 Inhibitor for the Enhancement of T-Cell Immunity against Cancer. J. Mowat, **R. Carretero**, G. Leder, N. A. Font, R. Neuhaus, S. Berndt, J. Günther, A. Friberg, M. Schäfer, H. Briem, M. Raschke, H. M. Ondozabal, B. Buchmann, U. Boemer, B. Kreft, I. V. Hartung, R. Offringa. J Med Chem. 2024 Oct 10;67(19):17429-17453.
2. Pericyte phenotype switching alleviates immunosuppression and sensitizes vascularized tumors to immunotherapy in preclinical models.Z. Li, B. He, A. Domenichini, J. Satiaputra, K. H. Wood, D. D. Lakhiani, A. A. Bashaw, L. M. Nilsson, J. Li, E. R. Bastow, A. Johansson-Percival, E. Denisenko, A. R. Forrest, S. Sakaram, **R. Carretero**, G. J. Hämmerling, J. A. Nilsson, G. Y. Lee, Ruth Ganss. J Clin Invest. 2024 Sep 17;134(18):e179860
3. The Alliance Between the German Cancer Research Center and Bayer: A Retrospective of an Innovative Collaboration Model. A. Zuccotti, R. Carretero, H. Hess-Stumpp. Handb Exp Pharmacol. 2024:286:83-95.
4. ***Targeting the aryl hydrocarbon receptor (AhR) with BAY 2416964: a selective small molecule inhibitor for cancer immunotherapy. Kober C, Roewe J, Schmees N, Roese L, Roehn U, Bader B, Stoeckigt D, Prinz F, Gorjánácz M, Roider HG, Olesch C, Leder G, Irlbacher H, Lesche R, Lefranc J, Oezcan-Wahlbrink M, Batra AS, Elmadany N, **Carretero R**, Sahm K, Oezen I, Cichon F, Baumann D, Sadik A, Opitz CA, Weinmann H, Hartung IV, Kreft B, Offringa R, Platten M, Gutcher I. Journal for Immunotherapy of Cancer. 2023
5. Secretogranin II influences the assembly and function of MHC class I in melanoma. Steinfass T, Poelchen J, Sun Q, Mastrogiulio G, Novak D, Vierthaler M, Pardo S, Federico A, Hüser L, Hielscher T, **Carretero R**, Offringa R, Altevogt P, Umansky V, Utikal J. Experimental Hematology & Oncology. 2023
6. Rgs16 promotes antitumor CD8+ T cell exhaustion. Weisshaar N, Wu J, Ming Y, Madi A, Hotz-Wagenblatt A, Ma S, Mieg A, Hering M, Zettl F, Mohr K, Schlimbach T, Ten Bosch N, Hertel F, Müller L, Byren H, Wang M, Borgers H, Munz M, Schmitt L, van der Hoeven F, Kloz U, **Carretero R**, Schleußner N, Jackstadt RF, Hofmann I, Cui G. Sci Immunol. 2022 May 27;7(71):eabh1873.
7. T cell-mediated elimination of cancer cells by blocking CEACAM6-CEACAM1 interaction. Pinkert J, Boehm HH, Trautwein M, Doecke WD, Wessel F, Ge Y, Gutierrez EM, **Carretero R**, Freiberg C, Gritzan U, Luetke-Eversloh M, Golfier S, Von Ahsen O, Volpin V, Sorrentino A, Rathinasamy A, Xydia M, Lohmayer R, Sax J, Nur-Menevse A, Hussein A, Stamova S, Beckmann G, Glueck JM, Schoenfeld D, Weiske J, Zopf D, Offringa R, Kreft B, Beckhove P, Willuda J. Oncoimmunology. 2021
8. Basophils Promote Tumor Rejection via Chemotaxis and Infiltration of CD8+ T Cells. Sektioglu IM, **Carretero R**, Bulbuc N, Bald T, Tüting T, Rudensky AY, Hämmerling GJ. Cancer Research. 2016
9. Macrophage-derived nitric oxide initiates T-cell diapedesis and tumor rejection. Sektioglu IM, **Carretero R**, Bender N, Bogdan C, Garbi N, Umansky V, Umansky L, Urban K, von Knebel-Döberitz M, Somasundaram V, Wink D, Beckhove P, Hämmerling GJ. Oncoimmunolgy. 2016
10. ***Eosinophils orchestrate cancer rejection by normalizing tumor vessels and enhancing infiltration of CD8(+) T cells. **Carretero R**, Sektioglu IM, Garbi N, Salgado OC, Beckhove P, Hämmerling GJ. Nature Immunology. 2015
11. Radiotherapy combined with TLR7/8 activation induces strong immune responses against gastrointestinal tumors. Schölch S, Rauber C, Tietz A, Rahbari NN, Bork U, Schmidt T, Kahlert C, Haberkorn U, Tomai MA, Lipson KE, **Carretero R**, Weitz J, Koch M, Huber PE. Oncotarget. 2015
12. Antibody therapy to human L1CAM in a transgenic mouse model blocks local tumor growth but induces EMT. Doberstein K, Harter PN, Haberkorn U, Bretz NP, Arnold B, **Carretero R**, Moldenhauer G, Mittelbronn M, Altevogt P. International journal of cancer. 2015
13. ***Involvement of HLA class I molecules in the immune escape of urologic tumors. **Carretero R**, Gil-Julio H, Vázquez-Alonso F, Garrido F, Castiñeiras J, Cózar JM. Actas urológicas españolas. 2014
14. A transcriptome-proteome integrated network identifies endoplasmic reticulum thiol oxidoreductase (ERp57) as a hub that mediates bone metastasis. Santana-Codina N, **Carretero R**, Sanz-Pamplona R, Cabrera T, Guney E, Oliva B, Clezardin P, Olarte OE, Loza-Alvarez P, Méndez-Lucas A, Perales JC, Sierra A. Molecular and cellular proteomics. 2013
15. Correlates between host and viral transcriptional program associated with different oncolytic vaccinia virus isolates. Reinboth J, Ascierto ML, Chen NG, Zhang Q, Yu YA, Aguilar RJ, **Carretero R**, Worschech A, Zhao Y, Wang E, Marincola FM, Szalay AA. Human gene therapy methods. 2012
16. VEGF polymorphisms are not associated with an increased risk of developing renal cell carcinoma in Spanish population. Sáenz-López P, Vazquez F, Cozar JM, **Carretero R**, Garrido F, Ruiz-Cabello F. Human immunology. 2013
17. ***Association between C13ORF31, NOD2, RIPK2 and TLR10 polymorphisms and urothelial bladder cancer. Guirado M, Gil H, Saenz-Lopez P, Reinboth J, Garrido F, Cozar JM, Ruiz-Cabello F, **Carretero R.** Human immunology. 2012
18. ***Regression of melanoma metastases after immunotherapy is associated with activation of antigen presentation and interferon-mediated rejection genes. **Carretero R**, Wang E, Rodriguez AI, Reinboth J, Ascierto

ML, Engle AM, Liu H, Camacho FM, Marincola FM, Garrido F, Cabrera T. International journal of cancer. 2012

19. Bacillus Calmette-Guerin immunotherapy of bladder cancer induces selection of human leukocyte antigen class I-deficient tumor cells. **Carretero R**, Cabrera T, Gil H, Saenz-Lopez P, Maleno I, Aptsiauri N, Cozar JM, Garrido F. international journal of cancer. 2011
20. Impact of interleukin-18 polymorphisms-607 and -137 on clinical characteristics of renal cell carcinoma patients. Sáenz-López P, **Carretero R**, Vazquez F, Martin J, Sánchez E, Tallada M, Garrido F, Cózar JM, Ruiz-Cabello F. Human immunology. 2010
21. Polymorphisms in inflammatory response genes in metastatic renal cancer. Sáenz López P, Vázquez Alonso F, Romero JM, **Carretero R**, Tallada Buñuel M, Ruiz Cabello F, Cózar Olmo JM. Actas Urologicas españolas. 2009
22. Changes in activatory and inhibitory natural killer (NK) receptors may induce progression to multiple myeloma: implications for tumor evasion of T and NK cells. Bernal M, Garrido P, Jiménez P, **Carretero R**, Almagro M, López P, Navarro P, Garrido F, Ruiz-Cabello F. Human Immunolgy. 2008
23. Genetic polymorphisms of RANTES, IL1-A, MCP-1 and TNF-A genes in patients with prostate cancer. Sáenz-López P, **Carretero R**, Cózar JM, Romero JM, Canton J, Vilchez JR, Tallada M, Garrido F, Ruiz-Cabello F. BMC cancer. 2008
24. A polymorphism in the interleukin-10 promoter affects the course of disease in patients with clear-cell renal carcinoma. Romero JM, Sáenz-López P, Cózar JM, **Carretero R**, Canton J, Vazquez F, Concha A, Tallada M, Garrido F, Ruiz-Cabello F. Human Immunology. 2009
25. Analysis of HLA class I expression in progressing and regressing metastatic melanoma lesions after immunotherapy. **Carretero R**, Romero JM, Ruiz-Cabello F, Maleno I, Rodriguez F, Camacho FM, Real LM, Garrido F, Cabrera T. Immunogenetics. 2008
26. Regressing and progressing metastatic lesions: resistance to immunotherapy is predetermined by irreversible HLA class I antigen alterations. Aptsiauri N, **Carretero R**, Garcia-Lora A, Real LM, Cabrera T, Garrido F. Cancer immunology immunotherapy. 2008

Additional Information

Awards

2007 - National Special Award.
Ministry of education. Awarded to the 4th best University Biology student of Spain.
2007 - University of Granada Special Award.
Universidad de Granada (UGR). Awarded to the best Biology student of the University of Granada.
2010 and 2012 - outstanding poster award

Conferences

15 oral presentations in conferences
>60 posters presentations in conferences

Research visits

2009-2010 International Research grant
National Institutes of Health (NIH). Maryland, USA.
Supervisor: Francesco M. Marincola.