

BIOGRAPHICAL SKETCH

NAME: Carracedo, Arkaitz	POSITION TITLE Ikerbasque Research Professor - Group leader at CIC bioGUNE		
BIRTH DATE (Mo., Day, Yr.): 11/15/1979			
EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)			
INSTITUTION AND LOCATION	DEGREE (if applicable)	MM/YY	FIELD OF STUDY
Complutense University of Madrid, Spain	B.S.	06/2002	Biology
Complutense University of Madrid, Spain	M.Sc.	2004	Biochemistry and molecular biology
Complutense University of Madrid, Spain	PhD	09/2006	Cancer cell signaling
Memorial Sloan Kettering Cancer Center, NY, USA	PostDoc	07/2007	Cancer cell signaling and mouse modeling
Beth Israel Deaconess Medical Center, Boston, USA	Senior Postdoc	08/2010	Cancer cell metabolism

Positions and Honors

Positions and Employment

01/2007-08/2007 Postdoctoral fellow, Pandolfi lab, MSKCC, NY, USA
08/2007-08/2010 Senior Postdoc, Pandolfi lab, BIDMC/HMS, Boston, USA
09/2010-06/2011 Ramón y Cajal researcher and Junior group leader, CIC bioGUNE, Bizkaia, Spain
07/2011-Today IKERBASQUE Research Professor
11/2012-Today Associate Professor at University of the Basque Country

Other Experience and Professional Memberships

2004 Member, Spanish National and European association for biochemistry and Molecular Biology
2007 Member, New York Academy of Sciences
2011 Member, Spanish and European Association for Cancer Research
2013 ERC investigator
2014 Member of the directive committee of ASEICA
2017 Member of CIBERONC (Principal investigator of a research group)

Honors

-Basque government PhD Fellowship, 2002-2006.
-FEBS short-term Fellowship 2005.
-Outstanding PhD award. Complutense University of Madrid 2007.
-Best oral presentation. Spanish National Society for Cannabinoid Research meeting 2004.
-Best publication of the year. Spanish National Society for Cannabinoid Research meeting 2006.
-Promega *Accesit* award 2007. Spanish Society of Biochemistry and Molecular Biology 2007.
-EMBO long-term Fellowship 2008-2009.
-Ramon y Cajal award 2009.
-IKERBASQUE Professorship, 2011.
-ERC starting Grant 2013
-Premio de la fundación BBVA a grupos de investigación biomédica 2016
-Premio a la investigación biomédica Cadena SER / Radio Bilbao 2017
-Premio Constantes y Vitales al Joven Talento en Investigación Biomédica 2017

Selected Peer-reviewed Publications.

Total Articles in Publication List: 84
Articles With Citation Data: 79
Sum of the Times Cited: 6314
Average Citations per Article: 79.92
h-index: 33 (2004-2017)

1. Zabala-Letona A, Arruabarrena-Aristorena A, Martin-Martin N, Fernandez-Ruiz S, Sutherland JD, Clasquin M, Tomas-Cortazar J, Jimenez J, Torres I, Quang P, Ximenez-Embun P, Bago R, Ugalde-Olano A, Loizaga-Iriarte A, Lacasa-Viscasillas I, Unda M, Torrano V, Cabrera D, van Liempd SM, Cendon Y, Castro E, Murray S, Revandkar A, Alimonti A, Zhang Y, Barnett A, Lein G, Pirman D, Cortazar AR, Arreal L, Prudkin L, Astobiza I, Valcarcel-Jimenez L, Zuniga-Garcia P, Fernandez-Dominguez I, Piva M, Caro-Maldonado A, Sanchez-Mosquera P, Castillo-Martin M, Serra V, Beraza N, Gentilella A, Thomas G, Azkargorta M, Elortza F, Farras R, Olmos D, Efeyan A, Anguita J, Munoz J, Falcon-Perez JM, Barrio R, Macarulla T, Mato JM, Martinez-Chantar ML, Cordon-Cardo C, Aransay AM, Marks K, Baselga J, Tabernero J, Nuciforo P, Manning BD, Marjon K, **Carracedo A**. mTORC1-dependent AMD1 regulation sustains polyamine metabolism in prostate cancer. **Nature**. 2017;547:109-13.
2. Valcarcel-Jimenez L, Gaude E, Torrano V, Frezza C, **Carracedo A**. Mitochondrial Metabolism: Yin and Yang for Tumor Progression. **Trends Endocrinol Metab**. 2017.
3. Torrano V, **Carracedo A**. Quiescence-like Metabolism to Push Cancer Out of the Race. **Cell Metab**. 2017;25:997-9.
4. Porteiro B, Fondevila MF, Delgado TC, Iglesias C, Imbernon M, Iruzubieta P, Crespo J, Zabala-Letona A, Ferno J, Gonzalez-Teran B, Matesanz N, Hernandez-Cosido L, Marcos M, Tovar S, Vidal A, Sanchez-Ceinos J, Malagon MM, Pombo C, Zalvide J, **Carracedo A**, Buque X, Dieguez C, Sabio G, Lopez M, Aspichueta P, Martinez-Chantar ML, Nogueiras R. Hepatic p63 regulates steatosis via IKKbeta/ER stress. **Nat Commun**. 2017;8:15111.
5. Pey J, San Jose-Eneriz E, Ochoa MC, Apaolaza I, de Atauri P, Rubio A, Cendoya X, Miranda E, Garate L, Cascante M, **Carracedo A**, Agirre X, Prosper F, Planes FJ. In-silico gene essentiality analysis of polyamine biosynthesis reveals APRT as a potential target in cancer. **Sci Rep**. 2017;7:14358.
6. Martin-Martin N, Zabala-Letona A, Fernandez-Ruiz S, Arreal L, Camacho L, Castillo-Martin M, Cortazar AR, Torrano V, Astobiza I, Zuniga-Garcia P, Ugalde-Olano A, Loizaga A, Unda M, Valcarcel-Jimenez L, Arruabarrena-Aristorena A, Piva M, Sanchez-Mosquera P, Aransay AM, Gomez -Muñoz A, Barrio R, Sutherland JD, **Carracedo A**. PPAR δ elicits ligand-independent repression of Trefoil Factor Family to limit prostate cancer growth. **Cancer Research**. 2017;in press.
7. Chen J, Guccini I, Di Mitri D, Brina D, Revandkar A, Pasquini E, Alajati A, Pinton S, Losa M, Sarti M, Civenni G, Catapano CV, Sgrignani J, Cavalli A, D'Antuono R, Asara JM, Morandi A, Chiarugi P, Crotti S, Agostini M, Montopoli M, Masgras I, Rasola A, Garcia-Escudero R, Delaleu N, Rinaldi A, Bertoni F, de Bonno J, **Carracedo A**, Alimonti A. Compartmentalized activities of the pyruvate dehydrogenase complex sustain lipogenesis in prostate cancer. **Nature Genetics**. 2017;In press.
8. Valcarcel-Jimenez L, Torrano V, **Carracedo A**. New insights on prostate cancer progression. **Cell Cycle**. 2016;1-2.
9. Torrano V, Valcarcel-Jimenez L, Cortazar AR, Liu X, Urošević J, Castillo-Martin M, Fernandez-Ruiz S, Morciano G, Caro-Maldonado A, Guiu M, Zuniga-Garcia P, Graupera M, Bellmunt A, Pandya P, Lorente M, Martin-Martin N, David Sutherland J, Sanchez-Mosquera P, Bozal-Basterra L, Zabala-Letona A, Arruabarrena-Aristorena A, Berenguer A, Embade N, Ugalde-Olano A, Lacasa-Viscasillas I, Loizaga-Iriarte A, Unda-Urzaiz M, Schultz N, Aransay AM, Sanz-Moreno V, Barrio R, Velasco G, Pinton P, Cordon-Cardo C, Locasale JW, Gomis RR, **Carracedo A**. The metabolic co-regulator PGC1alpha suppresses prostate cancer metastasis. **Nat Cell Biol**. 2016;18:645-56.
10. Torrano V, Royo F, Peinado H, Loizaga-Iriarte A, Unda M, Falcon-Perez JM, **Carracedo A**. Vesicle-MaNiA: extracellular vesicles in liquid biopsy and cancer. **Curr Opin Pharmacol**. 2016;29:47-53.
11. Tessier S, Martin-Martin N, de The H, **Carracedo A**, Lallemand-Breitenbach V. PML, a protein at the cross road of oxidative stress and metabolism. **Antioxid Redox Signal**. 2017 Mar 20;26(9):432-444.
12. Royo F, Zuniga-Garcia P, Torrano V, Loizaga A, Sanchez-Mosquera P, Ugalde-Olano A, Gonzalez E, Cortazar AR, Palomo L, Fernandez-Ruiz S, Lacasa-Viscasillas I, Berdasco M, Sutherland JD, Barrio R, Zabala-Letona A, Martin-Martin N, Arruabarrena-Aristorena A, Valcarcel-Jimenez L, Caro-Maldonado A, Gonzalez-Tampan J, Cachi-Fuentes G, Esteller M, Aransay AM, Unda M, Falcon-Perez JM, **Carracedo A**. Transcriptomic profiling of urine extracellular vesicles reveals alterations of CDH3 in prostate cancer. **Oncotarget**. 2016 Feb 9;7(6):6835-46.
13. Martin-Martin N, Piva M, Urošević J, Aldaz P, Sutherland JD, Fernandez-Ruiz S, Arreal L, Torrano V, Cortazar AR, Planet E, Guiu M, Radosevic-Rubin N, Garcia S, Macias I, Salvador F, Domenici G, Rueda OM, Zabala-Letona A, Arruabarrena-Aristorena A, Zuniga-Garcia P, Caro-Maldonado A, Valcarcel-Jimenez L, Sanchez-Mosquera P, Varela-Rey M, Martinez-Chantar ML, Anguita J, Ibrahim YH, Scaltriti M, Lawrie CH, Aransay AM, Iovanna JL, Baselga J, Caldas C, Barrio R, Serra V, Vivanco M, Matheu A, Gomis RR, **Carracedo A**. Stratification and therapeutic potential of PML in metastatic breast cancer. **Nat Commun**. 2016;7:12595.

14. Ugalde-Olano A, Egia A, Fernandez-Ruiz S, Loizaga-Iriarte A, Zuniga-Garcia P, Garcia S, Royo F, Lacasa-Viscasillas I, Castro E, Cortazar AR, Zabala-Letona A, Martin-Martin N, Arruabarrena-Aristorena A, Torrano-Moya V, Valcarcel-Jimenez L, Sanchez-Mosquera P, Caro-Maldonado A, Gonzalez-Tampan J, Cachi-Fuentes G, Bilbao E, Montero R, Fernandez S, Arrieta E, Zorroza K, Castillo-Martin M, Serra V, Salazar E, Macias-Camara N, Tabernero J, Baselga J, Cordon-Cardo C, Aransay AM, Villar AD, Iovanna JL, Falcon-Perez JM, Unda M, Bilbao R, **Carracedo A**. Methodological aspects of the molecular and histological study of prostate cancer: focus on PTEN. *Methods*. 2015;77-78:25-30.
15. Serra H, Chivite I, Angulo-Urarte A, Soler A, Sutherland JD, Arruabarrena-Aristorena A, Ragab A, Lim R, Malumbres M, Fruttiger M, Potente M, Ferrano M, Fabra A, Vinals F, Casanovas O, Pandolfi PP, Bigas A, **Carracedo A**, Gerhardt H, Graupera M. PTEN mediates Notch-dependent stalk cell arrest in angiogenesis. *Nat Commun*. 2015;6:7935.
16. Hermanova I, Arruabarrena-Aristorena A, Valis K, Nuskova H, Alberich-Jorda M, Fiser K, Fernandez-Ruiz S, Kavan D, Pecinova A, Niso-Santano M, Zaliova M, Novak P, Houstek J, Mracek T, Kroemer G, **Carracedo A**, Trka J, Starkova J. Pharmacological inhibition of fatty-acid oxidation synergistically enhances the effect of l-asparaginase in childhood ALL cells. *Leukemia*. 2015.
17. **Carracedo A**, Rousseau D, Douris N, Fernandez-Ruiz S, Martin-Martin N, Weiss D, Webster K, Adams AC, Vazquez-Chantada M, Martinez-Chantar ML, Anty R, Tran A, Maratos-Flier E, Gual P, Pandolfi PP. The promyelocytic leukemia protein is upregulated in conditions of obesity and liver steatosis. *Int J Biol Sci*. 2015;11:629-32.
18. Morales M, Arenas EJ, Urosevic J, Guiu M, Fernandez E, Planet E, Fenwick RB, Fernandez-Ruiz S, Salvatella X, Reverter D, **Carracedo A**, Massague J, Gomis RR. RARRES3 suppresses breast cancer lung metastasis by regulating adhesion and differentiation. *EMBO Mol Med*. 2014;6:865-81.
19. Martin-Martin N, Sutherland JD, **Carracedo A**. PML: Not all about Tumor Suppression. *Front Oncol*. 2013;3:200.
20. **Carracedo A**, Cantley LC, Pandolfi PP. Cancer metabolism: fatty acid oxidation in the limelight. *Nat Rev Cancer*. 2013;13:227-32.
21. Ito K*, **Carracedo A***, Weiss D, Arai F, Ala U, Avigan DE, Schafer ZT, Evans RM, Suda T, Lee CH, Pandolfi PP. A PML-PPAR-delta pathway for fatty acid oxidation regulates hematopoietic stem cell maintenance. *Nat Med*. 2012;18:1350-8. ***EQUAL CONTRIBUTION**
22. Hamidi T, Cano CE, Grasso D, Garcia MN, Sandi MJ, Calvo EL, Dagorn JC, Lomberg G, Urrutia R, Goruppi S, **Carracedo A**, Velasco G, Iovanna JL. Nupr1-aurora kinase A pathway provides protection against metabolic stress-mediated autophagic-associated cell death. *Clin Cancer Res*. 2012;18:5234-46.
23. Garcia-Cao I, Song MS, Hobbs RM, Laurent G, Giorgi C, de Boer VC, Anastasiou D, Ito K, Sasaki AT, Rameh L, **Carracedo A**, Vander Heiden MG, Cantley LC, Pinton P, Haigis MC, Pandolfi PP. Systemic elevation of PTEN induces a tumor-suppressive metabolic state. *Cell*. 2012;149:49-62.
24. Embade N, Fernandez-Ramos D, Varela-Rey M, Beraza N, Sini M, Gutierrez de Juan V, Woodhoo A, Martinez-Lopez N, Rodriguez-Iruretagoyena B, Bustamante FJ, de la Hoz AB, **Carracedo A**, Xirodimas DP, Rodriguez MS, Lu SC, Mato JM, Martinez-Chantar ML. Murine double minute 2 regulates Hu antigen R stability in human liver and colon cancer through NEDDylation. *Hepatology*. 2012;55:1237-48.
25. **Carracedo A**, Weiss D, Leliaert AK, Bhasin M, de Boer VC, Laurent G, Adams AC, Sundvall M, Song SJ, Ito K, Finley LS, Egia A, Libermann T, Gerhart-Hines Z, Puigserver P, Haigis MC, Maratos-Flier E, Richardson AL, Schafer ZT, Pandolfi PP. A metabolic prosurvival role for PML in breast cancer. *J Clin Invest*. 2012;122:3088-100.
26. Song MS, **Carracedo A**, Salmena L, Song SJ, Egia A, Malumbres M, Pandolfi PP. Nuclear PTEN regulates the APC-CDH1 tumor-suppressive complex in a phosphatase-independent manner. *Cell*. 2011;144:187-99.
27. Finley LW, **Carracedo A**, Lee J, Souza A, Egia A, Zhang J, Teruya-Feldstein J, Moreira PI, Cardoso SM, Clish CB, Pandolfi PP, Haigis MC. SIRT3 opposes reprogramming of cancer cell metabolism through HIF1alpha destabilization. *Cancer Cell*. 2011;19:416-28.
28. **Carracedo A**, Ito K, Pandolfi PP. The nuclear bodies inside out: PML conquers the cytoplasm. *Curr Opin Cell Biol*. 2011;23:360-6.
29. **Carracedo A**, Alimonti A, Pandolfi PP. PTEN level in tumor suppression: how much is too little? *Cancer Res*. 2011;71:629-33.
30. Alimonti A, **Carracedo A**, Clohessy JG, Trotman LC, Nardella C, Egia A, Salmena L, Sampieri K, Haveman WJ, Brogi E, Richardson AL, Zhang J, Pandolfi PP. Subtle variations in Pten dose determine cancer susceptibility. *Nat Genet*. 2010;42:454-8.
31. Salazar M, **Carracedo A**, Salanueva IJ, Hernandez-Tiedra S, Lorente M, Egia A, Vazquez P, Blazquez C, Torres S, Garcia S, Nowak J, Fimia GM, Piacentini M, Cecconi F, Pandolfi PP, Gonzalez-Feria L, Iovanna

- JL, Guzman M, Boya P, Velasco G. Cannabinoid action induces autophagy-mediated cell death through stimulation of ER stress in human glioma cells. *J Clin Invest*. 2009;119:1359-72.
32. Nardella C, Carracedo A, Alimonti A, Hobbs RM, Clohessy JG, Chen Z, Egia A, Fornari A, Fiorentino M, Loda M, Kozma SC, Thomas G, Cordon-Cardo C, Pandolfi PP. Differential requirement of mTOR in postmitotic tissues and tumorigenesis. *Sci Signal*. 2009;2:ra2.
 33. Lorente M, Carracedo A, Torres S, Natali F, Egia A, Hernandez-Tiedra S, Salazar M, Blazquez C, Guzman M, Velasco G. Amphiregulin is a factor for resistance of glioma cells to cannabinoid-induced apoptosis. *Glia*. 2009;57:1374-85.
 34. Chen Z, Carracedo A, Lin HK, Koutcher JA, Behrendt N, Egia A, Alimonti A, Carver BS, Gerald W, Teruya-Feldstein J, Loda M, Pandolfi PP. Differential p53-independent outcomes of p19(Arf) loss in oncogenesis. *Sci Signal*. 2009;2:ra44.
 35. Carver BS, Tran J, Gopalan A, Chen Z, Shaikh S, Carracedo A, Alimonti A, Nardella C, Varmeh S, Scardino PT, Cordon-Cardo C, Gerald W, Pandolfi PP. Aberrant ERG expression cooperates with loss of PTEN to promote cancer progression in the prostate. *Nat Genet*. 2009;41:619-24.
 36. Carver BS, Tran J, Chen Z, Carracedo-Perez A, Alimonti A, Nardella C, Gopalan A, Scardino PT, Cordon-Cardo C, Gerald W, Pandolfi PP. ETS rearrangements and prostate cancer initiation. *Nature*. 2009;457:E1; discussion E2-3.
 37. Song MS, Salmena L, Carracedo A, Egia A, Lo-Coco F, Teruya-Feldstein J, Pandolfi PP. The deubiquitylation and localization of PTEN are regulated by a HAUSP-PML network. *Nature*. 2008;455:813-7.
 38. Salmena L, Carracedo A, Pandolfi PP. Tenets of PTEN tumor suppression. *Cell*. 2008;133:403-14.
 39. Carracedo A, Salmena L, Pandolfi PP. SnapShot: PTEN signaling pathways. *Cell*. 2008;133:550 e1.
 40. Carracedo A, Pandolfi PP. The PTEN-PI3K pathway: of feedbacks and cross-talks. *Oncogene*. 2008;27:5527-41.
 41. Carracedo A*, Ma L*, Teruya-Feldstein J, Rojo F, Salmena L, Alimonti A, Egia A, Sasaki AT, Thomas G, Kozma SC, Papa A, Nardella C, Cantley LC, Baselga J, Pandolfi PP. Inhibition of mTORC1 leads to MAPK pathway activation through a PI3K-dependent feedback loop in human cancer. *J Clin Invest*. 2008;118:3065-74.
 42. Carracedo A, Baselga J, Pandolfi PP. Deconstructing feedback-signaling networks to improve anticancer therapy with mTORC1 inhibitors. *Cell Cycle*. 2008;7:3805-9.
 43. Carracedo A, Lorente M, Egia A, Blazquez C, Garcia S, Giroux V, Malicet C, Villuendas R, Gironella M, Gonzalez-Feria L, Piris MA, Iovanna JL, Guzman M, Velasco G. The stress-regulated protein p8 mediates cannabinoid-induced apoptosis of tumor cells. *Cancer Cell*. 2006;9:301-12.
 44. Carracedo A, Gironella M, Lorente M, Garcia S, Guzman M, Velasco G, Iovanna JL. Cannabinoids induce apoptosis of pancreatic tumor cells via endoplasmic reticulum stress-related genes. *Cancer Res*. 2006;66:6748-55.
 45. Carracedo A, Egia A, Guzman M, Velasco G. p8 Upregulation sensitizes astrocytes to oxidative stress. *FEBS Lett*. 2006;580:1571-5.
 46. Carracedo A, Geelen MJ, Diez M, Hanada K, Guzman M, Velasco G. Ceramide sensitizes astrocytes to oxidative stress: protective role of cannabinoids. *Biochem J*. 2004;380:435-40.

Organized Conferences

- 2014 First EMBO Workshop on Translational advances in Cancer cell signaling and metabolism (Bilbao)
- 2015 ASEICA international conference (Sevilla)
- 2016 Second EMBO Conference on Translational research in cancer cell metabolism (Bilbao)
- 2017 First ASEICA Educational Symposium (Madrid)
- 2018 EACR Conference Series – Mechanism to therapies: Innovations in Cancer Metabolism (Bilbao)

Patents

Title: METHODS FOR THE PROGNOSIS OF PROSTATE CANCER (European patent application EP16382219.0).

Research Support

Ongoing Research Support

-AECC Proyectos Semilla

09/2017-08/2019

La interacción entre el tumor y el eritrocito a través de vesículas extracelulares como método diagnóstico de cáncer

PI: Arkaitz Carracedo

<u>20.000 euros</u>	
-European Training Networks Project No: 721532; European Commission <i>TRAIN: Tribbles Research and Innovation Network</i> ; PI: Arkaitz Carracedo (Coordinator: Endre Kiss-Toth).	09/2016-08/2020
<u>3.818.970 euros</u>	
-ERC Starting Grant, European Research Council, Project No: 336343 <i>Metabolic requirements for prostate cancer cell fitness</i> ;; PI: Arkaitz Carracedo	11/2013-10/2018
<u>1498.686 euros</u>	
-BBVA Award to Research Teams BBVA Foundation. <i>Transcriptional regulation of metabolism for precision medicine in prostate cancer</i> PI: Arkaitz Carracedo	09/01/2016-08/31/2019
<u>125.000 euros</u>	
-ERC Proof of Concept. European Commission A metabolism-based prognostic biomarker for prostate cancer – MetaboMARKER PI: Arkaitz Carracedo	07/01/2017-12/31/2018
<u>150.000 euros</u>	
-Spanish Ministry of Economy and Competitiveness (SAF) Estudio del metabolismo para la aplicación de medicina de precisión en cáncer de próstata metastático PI: Arkaitz Carracedo	01/01/2017-12/31/2019
<u>240.000 euros</u>	
<u>Completed Support</u>	
-FERO Foundation <u>Stratification and therapeutic potential of PML in breast cancer</u> Role: PI	11/01/2015-10/31/2016
<u>70.000 euros</u>	
-Marie Curie Grant International Reintegration grant <u>Implication of energy sensing pathways in prostate cancer biology</u> Role: PI	01/01/12-12/31/15
<u>100.000 euros</u>	
-Department of Health, Education and Universities <u>Implication of methionine metabolism in prostate cancer through alterations in DNA methylation</u> Role: PI	01/01/12-12/31/14
<u>56.000 euros</u>	
-Department of Health <u>Biomarker identification in prostate cancer through the comparative analysis of human and mouse specimens</u> Role: PI	01/01/13-12/31/15
<u>28.000 euros</u>	
-2013 Movember Global Action Plan 1 <u>Exosome analysis in urine specimens from prostate cancer patients</u> Role: co-PI	01/01/13-12/31/14
<u>115.000 euros</u>	
-Spanish National Institute of health <u>Diagnostic an therapeutic potential of metabolism in prostate cancer</u> Role: PI	01/01/14-12/31/16
<u>120.000 euros</u>	
-Spanish National Institute of health <u>Implication of fatty acid oxidation-regulatory pathways in prostate cancer biology and treatment</u> Role: PI	01/01/11-12/31/13
<u>228.000 euros</u>	
-Basque Government, Special support actions <u>Establishment of technical support for primary cell work and retroviral transduction</u> Role: PI	06/01/11-12/31/11
<u>6.000 euros</u>	