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Education

Fall 2008 - Winter 2016	Massachusetts Institute of Technology Department of Biology Ph.D. in Biology
Fall 2003 - Spring 2008	University of Puerto Rico, Mayagüez, PR Department of Biology B.S. in Microbiology

Research

January 2016 - Present	Memorial Sloan Kettering Cancer Center - Sloan Kettering Institute Postdoctoral fellow in the laboratory of Dr. Scott W. Lowe Main Project: Dissecting the biological impact of mutational heterogeneity using mouse models and genome engineering
June 2009 - January 2016	Department of Biology at MIT and David H. Koch Institute for Integrative Cancer Research Graduate student in the laboratory of Dr. Tyler Jacks Thesis title: Constructing and deconstructing cancer using CRISPR-Cas9 Main projects: 1) Modeling cancer <i>in vivo</i> using the CRISPR-Cas9 system. 2) CRISPR screens for uncovering genotype-specific cancer drug targets. 3) Molecular mechanisms dictating tumor-specific responses to p53 restoration.
June 2008 - August 2008	Whitehead Institute for Biomedical Research Summer student researcher in the laboratory of Dr. Harvey F. Lodish Project: The role of histone deacetylases in enucleation of cultured mouse fetal erythroblasts.
June 2007 - August 2007	Department of Biology at MIT

Summer student researcher in the laboratory of **Dr. Stephen P. Bell**

Project: Identification of dominant negative helicase mutants by insertional mutagenesis of the yeast replicative helicase Mcm2-7.

January 2006 - May 2008

University of Puerto Rico, Mayagüez Campus

Department of Biology

Undergraduate researcher in the laboratory of **Dr. Carlos Ríos-Velázquez**

Main project: Development and analysis of gene libraries from tropical hypersaline microbial mats.

Academic Honors

- 2020** Selected among 100 inspiring Hispanic/Latinx scientists in America by Cell Mentor
- 2020 – 2022** MSKCC GMTEC Postdoctoral Researcher Innovation Grant
- 2019** MSK Society Scholars Prize / The Davis Family Society Scholar Prize
- 2018 – 2026** Howard Hughes Medical Institute Hanna H. Gray Fellowship
- 2016 – 2017** MSKCC Translational Research Oncology Training Program Fellowship
- 2012** AACR Minority Scholar in Cancer Research Award to attend the 2012 AACR Meeting
- 2011** Repligen KIICR Graduate Fellowship
- 2006 – 2008** NSF PR-LSAMP Scholar
- 2006 – 2008** NIH MARC Scholar

Presentations

- 2020** **Invited speaker**, NYU Perlmutter Cancer Center Research Seminar Series, New York, NY.
- 2019** **Invited speaker**, QIAGEN Cancer Research Day, Weill Cornell Medical Center, New York, NY.
- 2019** **Poster presenter**, HHMI Science Meeting, Janelia Research Campus, Ashburn, VA.
- 2019** **Invited speaker**, Broad Institute Next Generation Symposium in Biomedicine, Cambridge, MA.
- 2018** **Speaker and poster presenter**, HHMI Science Meeting, Janelia Research Campus, Ashburn, VA.
- 2018** **Poster presenter**, SKI Geoffrey Beene Cancer Research Center Retreat, Skytop, PA. *Won prize for best poster presentation.
- 2015** **Invited speaker**, Harvard Medical School Graduate Course - *Cell Biology: Current Topics and Techniques in Cancer Biology Research*.
- 2014** **Invited speaker**, Koch Institute Crossfire Seminar - *Applications of the CRISPR-Cas9 System in Cancer Biology*.
- 2014** **Speaker**, Colrain Meeting, Harvard, MA.
- 2014** **Poster presenter**, Mechanisms and Models of Cancer Meeting, Cold Spring Harbor Laboratory, NY.
- 2014** **Speaker**, AACR Annual Meeting, San Diego, CA.

- 2013 **Poster presenter**, Frontiers in Tumour Heterogeneity and Plasticity, Nature/CNIO, Madrid, Spain.
- 2012 **Speaker**, AACR Annual Meeting, Chicago, IL.
- 2011 **Poster presenter**, Mechanisms and Models of Cancer Meeting, Salk Institute, La Jolla, CA.
- 2008 **Poster presenter**, ASM General Meeting, Boston, MA.
- 2007 **Poster presenter**, ASCB Annual Meeting, Washington, DC.
- 2007 **Poster presenter**, ACS 234th National Meeting and Exposition, Boston, MA.
- 2007 **Poster presenter**, ASM General Meeting, Toronto, Canada.

Additional Training

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| Summer 2017 | Cold Spring Harbor Laboratory |
| | CSHL Course: Statistical Methods for Functional Genomics |
| June 2020 | Howard Hughes Medical Institute |
| | Mentor Training Workshop |

Teaching Experience & Outreach

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| November 2019 | Memorial Sloan Kettering Cancer Center |
| | HOPP High School Science Enrichment Program (SEP) |
| | Teaching fellow - Tumor Suppressors Module |
| November 2019 | Yale Ciencia Academy |
| | Application reviewer for the 2020 Yale Ciencia Academy program |
| March 2019 | Yale Ciencia Academy |
| | Invited panelist: Virtual Panel on Getting Funded |
| August 2018 | Yale Ciencia Academy |
| | Invited panelist: Virtual Panel on Securing a Postdoc |
| Spring 2013 | Department of Biology at Harvard University |
| | Teaching fellow for LS1b – Genetics, Genomics and Evolution |
| Spring 2012 | Department of Biology at MIT |
| | Teaching assistant for 7.16 – Biotechnology II |
| October 2010-11, 2014-15 | Massachusetts Junior Academy of Sciences |
| | Scientific judge for the MJAS Symposium |
| Fall 2009 | Department of Biology at MIT |
| | Teaching assistant for 7.012 – Introductory Biology |
| Summer 2007 & 2008 | University of Puerto Rico, Mayagüez Campus |

Mentoring Experience

Vincent Tem: research technician in the Lowe Laboratory at MSKCC

Margaret Kennedy: Gerstner Sloan Kettering graduate student in the Lowe Laboratory at MSKCC

Ellie Benitez: Tri-Institutional MD-PhD rotation student; currently on her first year of MD-PhD studies

Stella Paffenholz: Gerstner Sloan Kettering graduate student in the Lowe Laboratory at MSKCC

Corina Amor Vegas: Gerstner Sloan Kettering graduate student in the Lowe Laboratory at MSKCC

Mary Clare Beytagh: MIT UROP; 2018 Rhodes Scholar; currently an MD/PhD student at UCSF

Rodrigo Romero: graduate student in the Jacks Laboratory at MIT; now a postdoc at MSKCC (Sawyers Lab)

Ryan Stott: MIT Biology rotation Student; currently a graduate student in the Tsai Laboratory at MIT

John Replogle: MIT Biology rotation Student; currently a graduate student in the Amon Laboratory at MIT

Candace Wu: MIT UROP; currently a medical student at UT Southwestern Medical School

Raul Barraza: MIT UROP; currently a Structural Design Engineer I at Northrop Grumman Corporation

Gillian Rossini Yang: MIT UROP; currently a Research Associate at Juno Therapeutics

Lucius Xuan: summer student at MIT; currently an undergraduate student at Boston College

Publications (Published / In Press / Pre-Prints)

1. Hoffmann, H.H.*, Schneider, W.M.*, **Sánchez-Rivera, F.J.***, Luna, J.M.*, Ashbrook, A.W., Soto-Feliciano, Y.M., Leal, A.A., Le Pen, J., Ricardo-Lax, I., Michailidis, E., Hao, Y., Stenzel, A.F., Peace, A., Allis, C.D., Lowe, S.W., MacDonald, M.R., Poirier, J.T.#, Rice, C.M.# (2020). Functional interrogation of a SARS-CoV-2 host protein interactome identifies unique and shared coronavirus host factors. *bioRxiv*. DOI: <https://doi.org/10.1101/2020.09.11.291716>. *Co-first author, #Co-corresponding author.
2. Gupta, M., Concepcion, C.P., Fahey, C.G., Fillmore-Brainson, C., **Sánchez-Rivera, F.J.**, Pessina, P., Bhutkar, A., Kim, J.Y., Simoneau, A., Beytagh, M.C., Keshishian, H., Stanclift, C., Schenone, M., Mani, D.R., Li, C., Oh, A., Li, F., Hu, H., Karatza, A., Wong, K.K., Shaw, A.T., Hata, A.N., Carr, S.A., Zou, L., Jacks, T., Kim, C.F. (2020). BRG1 loss predisposes lung cancers to replicative stress and ATR dependency. *Cancer Research*. In Press. DOI:
3. Romero, R.*, **Sánchez-Rivera, F.J.***, Westcott, P.M.K., Mercer, K.L., Bhutkar, A., Muir, A., González-Robles, T.J., Lamboy-Rodríguez, S.A., Liao, L.Z., Ng, S.R., Li, L., Colón, C.I., Naranjo, S., Beytagh, M.C., Lewis, C.A., Hsu, P.P., Bronson, R.T., Vander Heiden, M.G., Jacks, T. (2020). Keap1 mutation renders lung adenocarcinomas dependent on Slc33a1. *Nature Cancer*. DOI: <https://doi.org/10.1038/s43018-020-0071-1>. *Co-first author.
4. Gorelick, A.N., **Sánchez-Rivera, F.J.**, Cai, Y., Bielski, C.M., Biederstedt, E., Jonsson, P., Richards, A.L., Vasan, N., Penson, A.V., Friedman, N.D., Ho, Y., Baslan, T., Bandlamudi, C., Scaltriti, M., Schultz, N., Lowe, S.W., Reznik, E.#, Taylor, B.S.# (2020). Phase and context shape the function of composite oncogenic mutations. *Nature*. DOI: <https://doi.org/10.1038/s41586-020-2315-8>. #Co-corresponding author.

5. Oni, T.E.*, Biffi, G.*, Baker, L.A., Hao, Y., Tonelli, C., Somerville, T.D.D., Deschênes, A., Belleau, P., Hwang, C., **Sánchez-Rivera, F.J.**, Cox, H., Brosnan, E., Doshi, A., Lumia, R.P., Khaledi, K., Park, Y., Trotman, L.C., Lowe, S.W., Krasnitz, A., Vakoc, C.R., Tuveson, D.A. (2020). SOAT1 abrogates cholesterol feedback inhibition to promote mevalonate pathway dependency in pancreatic cancer. *Journal of Experimental Medicine*. DOI: <https://doi.org/10.1084/jem.20192389>. *Co-first author.
6. Leibold, J.*, Ruscetti, M.*, Cao, Z.*, Ho, Y., Baslan, T., Zou, M., Abida, W., Feucht, J., Han, T., Barriga, F.M., Tsanov, K.M., Zamechek, L., Kulick, A., Amor, C., Tian, S., Salgado, N.R., **Sánchez-Rivera, F.J.**, Watson, P.A., de Stanchina, E., Wilkinson, J.E., Dow, L.E., Abate-Shen, C., Sawyers, C.L.#, Lowe, S.W.# (2020). Somatic tissue engineering in mouse models reveals an actionable role for WNT pathway alterations in prostate cancer metastasis. *Cancer Discovery*. DOI: 10.1158/2159-8290.CD-19-1242. *Co-first author, #Co-corresponding author.
7. Yuan, S., Natesan, R., **Sánchez-Rivera, F.J.**, Li, J., Bhanu, N.V., Yamazoe, T., Lin, J.H., Merrell, A.J., Thomas, S.K., Miller, E.M., Shi, J., Garcia, B.A., Lowe, S.W., Asangani, I.A., Stanger, B.Z. (2020) Global regulation of the histone mark H3K36me2 underlies epithelial plasticity and metastatic progression. *Cancer Discovery*. **(10) (6)**, 854-871.
8. Morris IV, J.P.*, Yashinski, J.J.*, Koche, R., Chandwani, R., Tian, S., Chen, C., Baslan, T., Marinkovic, Z.S., **Sánchez-Rivera, F.J.**, Leach, S.D., Carmona-Fontaine, C., Thompson, C.B., Finley, L.W.S.#, Lowe, S.W.# (2019) α -Ketoglutarate links p53 to cell fate during tumour suppression. *Nature*. **573**, 595-599.
9. Loizou, E., Banito, A., Livshits, G., Ho, Y., Koche, R., **Sánchez-Rivera, F.J.**, Mayle, A., Chen, C., Kinalis, S., Bagger, F.O., Kastenhuber, E., Durham, B.H., Lowe, S.W. (2019) A gain-of-function p53 mutant oncogene promotes cell fate plasticity and myeloid leukemia through the pluripotency factor Foxh1. *Cancer Discovery*. **9 (7)**, 926-979.
10. Ruscetti, M.*, Leibold, J.*, Bott, M.J.*, Fennell, M., Kulick, A., Salgado, N.R., Chen, C., Ho, Y., **Sánchez-Rivera, F.J.**, Feucht, J., Baslan, T., Tian, S., Chen, H., Romesser, P.B., Poirier, J.T., Rudin, C.M., de Stanchina, E., Manchado, E., Sherr, C.J., Lowe, S.W. (2018) NK cell-mediated cytotoxicity contributes to the efficacy of a cytostatic drug combination in lung cancer. *Science*. **362**, 1416-1422. *Co-first author.
11. Zafra, M.P.*, Schatoff, E.M.*, Katti, A., Foronda, M., Breinig, M., Schweitzer, A.Y., Simon, A., Han, T., Goswami, S., Montgomery, E., Thibado, J., Kastenhuber, E.R., **Sánchez-Rivera, F.J.**, Shi, J., Vakoc, C.R., Lowe, S.W., Tschaharganeh, D.F., Dow, L. (2018). Optimized base editors enable efficient editing in cells, organoids and mice. *Nature Biotechnology*. **36**, 888–893. *Co-first author.
12. González-Vallinas, M., Rodríguez-Paredes, M., Albrecht, M., Sticht, C., Stichel, D., Gutekunst, J., Pitea, A., Sass, S., **Sánchez-Rivera, F.J.**, Lorenzo-Bermejo, J., Schmitt, J., De La Torre, C., Warth, A., Theis, F.J., Müller, N.S., Gretz, N., Muley, T., Meister, M., Tschaharganeh, D.F., Schirmacher, P., Matthäus, F., Breuhahn, K. (2018) Epigenetically Regulated Chromosome 14q32 miRNA Cluster Induces Metastasis and Predicts Poor Prognosis in Lung Adenocarcinoma Patients. *Molecular Cancer Research*. **16**, 390-402.
13. Romero, R.*, Sayin, V.I.*, Davidson, S.M., Bauer, M., Singh, S.X., LeBoeuf, S.E., Karakousi, T.R., Ellis, D.C., Bhutkar, A., **Sánchez-Rivera, F.J.**, Subbaraj, L., Martinez, B., Bronson, R.T., Prigge, J.R., Schmidt, E.E., Thomas, C.J., Davies, A., Dolgalev, I., Heguy, A., Allaj, V., Poirier, J.T., Moreira, A.L.,

- Rudin, C.M., Pass, H.I., Vander Heiden, M.G., Jacks, T.[#], Papagiannakopoulos, T.[#] (2017) Loss of Keap1 promotes KRAS-driven lung cancer and results in genotype specific metabolic vulnerabilities. *Nature Medicine*. **23**, 1362-1368. *Co-first author, [#]Co-corresponding author.
14. Gocheva, V., Naba, A., Bhutkar, A., Guardia, T., Miller, K.M., Li, C.M., Dayton, T.L., **Sánchez-Rivera, F.J.**, Kim-Kiselak, C., Jaikhan, N., Winslow, M.M., Del Rosario, A., Hynes, R.O., Jacks, T. (2017) Quantitative proteomics identify Tenascin-C as a promoter of lung cancer progression and contributor to a signature prognostic of patient survival. *Proceedings of the National Academy of Sciences*. **114**, E5625–E5634.
 15. Soto-Feliciano, Y.M.*^{*}, Bartlebaugh, J.M.E.*^{*}, Liu, Y.*^{*}, **Sánchez-Rivera, F.J.**, Bhutkar, A., Weintraub, A.S., Buenrostro, J.D., Cheng, C.S., Regev, A., Jacks, T., Young, R.A., Hemann, M.T. (2017) PHF6 regulates phenotypic plasticity through chromatin organization within lineage-specific genes. *Genes & Development*. **31**, 973-989. *Co-first author. Cover article.
 16. Tammela, T., **Sánchez-Rivera F.J.**, Cetinbas, N.M., Wu, K., Joshi, N.S., Helenius, K., Park, Y., Azimi, R., Kerper, N.R., Wesselhoeft, R.A., Gu, X., Schmidt, L., Cornwall-Brady, M., Yilmaz, Ö.H., Xue, W., Katajisto, P., Bhutkar, A., and Jacks, T. (2017) A Wnt-producing niche drives proliferative potential and progression in lung adenocarcinoma. *Nature*. **545**, 355-359.
 17. Roper, J.*^{*}, Tammela, T.*^{*}, Cetinbas, N.M., Akkad, A., Roghanian, A., Rickelt, S., Almqdadi, M., Wu, K., Oberli, M.A., **Sánchez-Rivera F.J.**, Park, Y., Liang, X., Eng, G., Taylor, M.S., Azimi, R., Kedrin, D., Neupane, R., Beyaz, S., Sicinska, E.T., Suarez, Y., Yoo, J., Chen, L., Zukerberg, L., Katajisto, P., Deshpande, V., Bass, A.J., Tschlis, P.N., Lees, J., Langer, R., Hynes, R.O., Chen, J., Bhutkar, A.J., Jacks, T., Yilmaz, Ö.H. (2017) In vivo genome editing and organoid transplantation models of colorectal cancer and metastasis. *Nature Biotechnology*. **35**, 569-576. *Co-first author.
 18. Mazur, P.K.*[#], Herner, A.*^{*}, Mello, S.S., Wirth, M., Hausmann, S., Kuschma, T., **Sánchez-Rivera, F.J.**, Lofgren, S., Hahn, S.A., Vangala, D., Trajkovic-Arsic, M., Gupta, A., Heid, I., Noël, P.B., Braren, R., Erkan, M., Kleeff, J., Sipos, B., Sayles, L.C., Heikenwälder, M., Heßmann, E., Ellenrieder, V., Esposito, I., Jacks, T., Bradner, J.E., Khatri, P., Sweet-Cordero, E.A., Attardi, L.D., Schmid, R.M., Schneider, G., Sage, J.[#], Siveke, J.T.[#] (2015) Combined inhibition of BET family proteins and histone deacetylases as a potential epigenetics-based therapy for pancreatic ductal adenocarcinoma. *Nature Medicine*. **21**, 1163-1171. *Co-first author, [#]Co-corresponding author.
 19. **Sánchez-Rivera, F.J.**, Jacks, T. (2015) Applications of the CRISPR-Cas9 system in cancer biology. *Nature Reviews Cancer*. **15**, 387-395.
 20. **Sánchez-Rivera, F.J.**^{*}, Papagiannakopoulos, T.*^{*}, Romero, R., Tammela, T., Bauer, M.R., Bhutkar, A., Joshi, N.S., Subbaraj, L., Bronson, R.T., Xue, W., Jacks, T. (2014) Rapid modelling of cooperating genetic events in cancer through somatic genome editing. *Nature*. **516**, 428–431. *Co-first author.
 21. Feldser, D.M., Kostova, K.K., Winslow, M.M., Taylor, S.E., Cashman, C., Whittaker, C.A., **Sánchez-Rivera, F.J.**, Resnick, R., Bronson, R.T., Hemann, M.T., Jacks, T. (2010) Stage-specific sensitivity to p53 restoration during lung cancer progression. *Nature*. **468**, 572-575.

Publications (In Preparation / Submitted / In Review / In Revision)

22. Soto-Feliciano, Y.M.*, **Sánchez-Rivera, F.J.***, Barrows, D., Gates, L., Cheon, D., Carroll, T., Ho, Y., Kastenhuber, E.R., Beytagh, M.C., Armstrong, S.A., Lowe, S.W.#, Allis, C.D.# (2020). Antagonism between mammalian MLL complexes dictates response to epigenetic therapies. *In Review*. *Co-first author, #Co-corresponding authors.
23. **Sánchez-Rivera, F.J.***, Ryan, J.*, Soto-Feliciano, Y.M., Beytagh, M.C., Xuan, L., Feldser, D.M., Hemann, M.T., Letai, A.#, Jacks, T.# (2020). Mitochondrial apoptotic priming is a key determinant of cell fate upon p53 restoration. *In Review*. *Co-first author, #Co-corresponding author.
24. Shakiba, M., Zumbo, P., Dündar, F., Espinosa-Carrasco, G., Camara, S., **Sánchez-Rivera, F.J.**, Lowe, S.W., Koche, R.P., Reuter, V.P., Socci, N.D., Whitlock, B., Tamzalit, F., Huse, M., Hellmann, M.D., Wells, D.K., Defranoux, N.A., Betel, D., Philip, M., Schietinger, A. (2020). TCR affinity dictates T cell functional states in tumors. *In Review*.
25. Jiang, T., **Sánchez-Rivera, F.J.**, Soto-Feliciano, Y.M., Song, C., Bhutkar, A., Hemann, M.T., Xue, W. (2020). Targeting de novo purine synthesis pathway via ADSL depletion impairs liver cancer growth by perturbing mitochondrial function. *In Review*.

References

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