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Research Vision: To develop computational frameworks that can accurately characterize the functional space of cellular biology from molecular features to unravel the mechanistic drivers of disease biology. Such frameworks can aid in improving the quality of human life by identifying novel drug targets and developing imaging/pathology biomarkers to optimize therapeutic decision making in the clinic, thereby ushering the era of precision medicine.

EDUCATION & TRAINING:	<ul style="list-style-type: none"> ➤ Applied Research Scientist II (September 2024 – present), Department of Cancer Physiology, H. Lee Moffitt Cancer Center & Research Institute, Tampa, FL. ➤ Applied Research Scientist I (September 2021 – September 2024), Department of Cancer Physiology, H. Lee Moffitt Cancer Center & Research Institute, Tampa, FL. ➤ Applied Postdoctoral Fellow (May 2018 – August 2021), Department of Cancer Physiology, H. Lee Moffitt Cancer Center & Research Institute, Tampa, FL. ➤ Postdoctoral Fellow (September 2016 – April 2018), Department of Cancer Imaging and Metabolism, H. Lee Moffitt Cancer Center & Research Institute, Tampa, FL. ➤ PhD in Aerospace Engineering (2012 – 2016), Virginia Polytechnic Institute and State University, Blacksburg, VA. GPA 3.96/4 ➤ Master of Technology in Aerospace Engineering (2010 – 2012), Indian Institute of Technology Kanpur, Kanpur, India. GPA 9.5/10 ➤ Bachelor of Technology in Electrical and Electronics Engineering (2006 – 2010), Jawaharlal Nehru Technological University Hyderabad, Hyderabad, India.
RESEARCH GRANTS & FUNDING:	<ul style="list-style-type: none"> ❖ Research Instructor 2022 – 2025 (20% FTE) Intramural support of 20% FTE to help carve out independent research projects to aid in career advancement for successful postdoctoral fellows and research scientists at Moffitt Cancer Center. ❖ 2021 MMRF (Multiple Myeloma Research Foundation) Research Fellow Award (\$75,000) Title: <i>A Multiomic Approach to Reverse Therapy Resistance in Multiple Myeloma.</i> Role: <u>Principal Investigator</u>. 12/01/2021 – 12/31/2022. ❖ 2019 Moffitt PSOC (Physical Sciences – Oncology Center) Pilot Project Award (\$15,000) Title: <i>Ex Vivo Dynamical Modeling of Multiple Myeloma using Individual Cell Tracking.</i> Role: <u>Principal Investigator</u>. 01/01/2020 – 08/31/2020. ❖ 2018 Moffitt PSOC (Physical Sciences – Oncology Center) Pilot Project Award (\$16,600) Title: <i>An ODE-based Mathematical Model of Multiple Myeloma Cell Dynamics ex vivo.</i> Role: <u>Principal Investigator</u>. 01/01/2019 – 08/31/2019.
PATENTS:	<ul style="list-style-type: none"> ➤ Silva, A., Shain, K., Sudalagunta, P.R., Canevarolo, R., Meads, M., “A model of clinical synergy in cancer”, PCT/US2020/062232 (WO/2021/108551-A1), priority date 11/25/2019. ➤ Silva, A., Sudalagunta, P.R., Shain, K., Canevarolo, R., Meads, M., “A Multiomic Approach to Modeling of Gene Regulatory Networks in Multiple Myeloma”, PCT/US2022/024217 (WO/2022/217136-A1), priority date 04/10/2021. ➤ Silva, A., Shain, K., Canevarolo, R., Sudalagunta, P.R., Meads, M., “Altering Epigenetic Landscapes Control Progression and Refractory Disease States In Multiple Myeloma”, PCT/US2023/078667 (WO/2024/097981), priority date 11/03/2022.
FEATURED IN MEDIA	<ul style="list-style-type: none"> • The Patient Story (March 1st, 2022): https://www.thepatientstory.com/research/multiple-myeloma-research/daratumumab-selinexor-moffitt/ • Moffitt Endeavor (February 4th, 2021): https://moffitt.org/endeavor/archive/combining-cycling-people-and-a-passion-for-cancer-research

<p>DATA SCIENCE & TECHNOLOGY CONTRIBUTIONS</p> <p>(CONCEPTION, DESIGN, DEVELOPMENT, AND DEPLOYMENT)</p>	<ul style="list-style-type: none"> ❖ Automated Monitoring and Analysis of Ex Vivo Drug Sensitivity Assays: Total Cancer Care® (TCC) consented Multiple myeloma (MM) patient samples at Pentecost Myeloma Research Center (PMRC) are treated with 31 drugs in ex vivo co-cultures and live imaged for six days. These experiments are programmatically monitored by a code continuously running on a HPC, which inspects the image metadata and flags any experimental issues by sending automated text messages to members of PMRC lab. This code also automatically analyzes the images once the experiment is completed and generates a PDF report summarizing the experimental results. Currently, these reports are forwarded to MM physicians at Moffitt to aid in clinical decision making. ❖ Abstraction of Longitudinal Clinical Data: Patient samples collected by PMRC lab (so far ~1100) are subjected to molecular (RNA-seq/WES) and functional characterization (ex vivo drug screening). The high-fidelity data obtained from these samples needs to be contextualized by their treatment/response histories and cytogenetic status from FISH (Fluorescence In-situ Hybridization) pathology reports. This was done by programmatically querying MM patients' treatments received, their doses, and billing dates from billing codes, FISH pathology reports, and serum labs data from Moffitt Cancer Analytics Platform (MCAP).
<p>INVITED TALKS/ CONFERENCES</p>	<ul style="list-style-type: none"> → Sudalagunta, P. R., “Functional Transcriptomics Supports DARATUMUMAB-SELINEXOR Sequential Therapy in Multiple Myeloma”, Medical Education Seminar, FORUS Therapeutics Inc., May, 2024. → Sudalagunta, P. R., “Functional Genomic Landscape of Multiple Myeloma Identifies Novel Therapeutic Strategies”, 2022 Moffitt Scientific Symposium, Tampa, Florida, 2022. → Sudalagunta, P. R., “Functional Genomic Landscape of Multiple Myeloma Informed by TCC-Avatar Data Identifies Novel Therapeutic Strategies”, 2022 ORIEN Scientific Retreat, Saint Petersburg, Florida, 2022. → Sudalagunta, P. R., “Rationale for Selinexor Treatment in Daratumumab-Refractory MM Patients Identified By Paired Ex Vivo Drug Sensitivity and RNA-Seq”, 2021 American Society of Hematology Annual Meeting, Atlanta, Georgia, 2021. → Sudalagunta, P. R., “Aeroelastic Control-oriented Modeling of an Air-breathing Hypersonic Vehicle,” 15th Dynamics Specialists Conference, AIAA Science and Technology Forum and Exposition, San Diego, California, 2016. → Sudalagunta, P. R., “A Novel Scheme to Accurately Compute Higher Vibration Modes using the Ritz Method and a Two-point BVP Solver,” 56th AIAA/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, Kissimmee, Florida, 2015.
<p>AWARD-WINNING ABSTRACTS:</p>	<ul style="list-style-type: none"> → [Abstract Achievement Award] Sudalagunta, P. R., Canevarolo, R. R., Meads, M. B., Silva, M. C., Cubitt, C, De Avila, G., Alugubelli, R. R., Logothetis, C., Zhang, Q., Hampton, O., DeCastro, A., Van Domelen, D. R., Chai, Y., Walker, C. J., Silva, A. S., Landesman, Y., Baz, R., and Shain, K. H. “<i>Rationale for Selinexor Treatment in Daratumumab-Refractory MM Patients Identified By Paired Ex Vivo Drug Sensitivity and RNA-Seq</i>”, ASH Annual Meeting, December 2021, Blood. → [Abstract Achievement Award] Sudalagunta, P. R., Renatino Canevarolo, R., Coelho Siqueira Silva, M. D., Meads, M. B., Tungesvik, A., De Avila, G., Shain, K. H., & Siqueira Silva, A., “<i>Pharmacodynamical Modeling of Two-Way Synergistic Effect for High-Throughput Drug Combination Screening in an Ex Vivo Reconstruction of Bone Marrow Using Primary Multiple Myeloma Cells</i>”, ASH Annual Meeting, December 2018, <i>Blood</i>, 132(Suppl 1), 1919. → [Best Poster Award] Sudalagunta, P. R., Renatino Canevarolo, R., Coelho Siqueira Silva, M. D., Meads, M. B., De Avila, G., Nguyen, T., Cubitt, C., Baz, R., Dalton, W., Shain, K., Silva, A., “<i>Mechanistic Modeling of Response to Therapy in Multiple Myeloma from ex vivo Measurements</i>”, 2017 Physical Sciences - Oncology Network Annual Investigators Meeting, MIT, October 2017. → [Young Investigator Award for Outstanding Poster] Sudalagunta, P. R., Renatino Canevarolo, R., Coelho Siqueira Silva, M. D., Meads, M. B., De Avila, G., Nguyen, T., Cubitt, C., Baz, R., Dalton, W., Shain, K., Silva, A., “<i>Mechanistic Modeling of Response to Therapy in Multiple Myeloma from ex vivo Measurements</i>”, Frontiers in Biomedical Imaging Science VI, Vanderbilt University Institute of Imaging Sciences (VUIIS), May 2017. → [Best Poster Award] Sudalagunta, P. R., Renatino Canevarolo, R., Coelho Siqueira Silva, M. D., Meads, M. B., De Avila, G., Nguyen, T., Cubitt, C., Baz, R., Dalton, W., Shain, K., Silva, A., “<i>Mechanistic Modeling of Response to Therapy in Multiple Myeloma from ex vivo Measurements</i>”, Moffitt Scientific Symposium, May 2017.

<p>RESEARCH MENTORSHIP:</p>	<ul style="list-style-type: none"> ➤ Qibing Jiang (Fall, 2019 – present), Department of Computer Science, University of Central Florida, Orlando, FL (Co-mentored with Dr. Wei Zhang) <ul style="list-style-type: none"> ○ Developed a comprehensive digital image processing tool in Python to dynamically quantify live imaging data of multiple myeloma cells extracted from bone marrow specimens donated by patients at Moffitt Cancer Center. ➤ High School Internship Program – Integrated Mathematical Oncology, Moffitt Cancer Center & Research Institute, Tampa, FL. <ul style="list-style-type: none"> Jonathan Williams (Summer, 2019), Pine Crest Preparatory School, Fort Lauderdale, FL <ul style="list-style-type: none"> ○ Reconstructed concentration-time curves using a pharmacokinetic model for an orally administered drug (Panobinostat) from parameters estimated in phase I clinical trials. Showed that dose modulation can benefit partially responding multiple myeloma (MM) patients, reinforcing the need for personalized medicine tools. Daniel Newton (Summer, 2018), San Marcos High School, Santa Barbara, CA <ul style="list-style-type: none"> ○ Developed an ODE model for MM cell line growth by fitting first and second order growth rates of MM cell populations (as opposed to cell population measures) in an <i>ex vivo</i> reconstruction of the bone marrow. Instrumental in PSOC pilot project award. Currently, an undergraduate student at Harvard. Urvashi Mahajan (Summer, 2017), C. Leon King High School, Tampa, FL <ul style="list-style-type: none"> ○ Simulated adaptive therapy for Bortezomib monotherapy using patient-specific models in multiple myeloma (MM), informed by experiments conducted on patient-derived MM cells in an <i>ex vivo</i> reconstruction of the bone marrow.
<p>ACADEMIC AWARDS:</p>	<ul style="list-style-type: none"> ▪ Research Instructor 2022 – 2025, H. Lee Moffitt Cancer Center & Research Institute. ▪ 2021 MMRF (Multiple Myeloma Research Foundation) Research Fellow Award. ▪ Abstract Achievement Award, American Society of Hematology, ASH Annual Meeting, 2021. ▪ Moffitt Physical Sciences – Oncology Center Pilot Project Award – 2019. ▪ Abstract Achievement Award, American Society of Hematology, ASH Annual Meeting, 2018. ▪ Moffitt Physical Sciences – Oncology Center Pilot Project Award – 2018. ▪ Two Minute Elevator Pitch Contest Winner, Developing Clinical Decision Support Tools in Multiple Myeloma, Junior Scientists Retreat, USF, 2018. ▪ Best Poster Award, Novel Quantitative Methods, 2017 Physical Sciences - Oncology Network Annual Investigators Meeting, MIT, October 2017. ▪ Young Investigator Award for Outstanding Poster, Frontiers in Biomedical Imaging Science VI, Vanderbilt University Institute of Imaging Sciences (VUIIS), May 2017. ▪ Best Poster Award, Clinical Science Division, Moffitt Scientific Symposium, May 2017. ▪ Academic Excellence Award in Aerospace Engineering from Indian Institute of Technology Kanpur for the year 2010 – 2011. ▪ Secured All India Rank (AIR) 94 in GATE-2010 (Graduate Aptitude Test in Engineering) and 102 in GATE-2009, Electrical & Electronics Engineering.
<p>FIRST-AUTHORED JOURNAL PUBLICATIONS:</p>	<ol style="list-style-type: none"> 1. Sudalagunta, P. R., Canevarolo, R. R., Meads, M. B., Silva, M. C., Zhao, X., Cubitt, C., Sansil, S., De Avila, G., Alugubelli, R. R., Bishop, R., Logothetis, C., Tungesvik, A., Zhang, Q., Hampton, O., Teer, J., Welsh, E., Yoder, S., Shah, B., Hazelhurst, L., Perez, L., Gatenby, R., Van Domelen, D. R., Chai, Y., Wang, F., DeCastro, A., Bloomer, A. M., Siegel, E. M., Lynch, C., Sullivan, D., Alsina, M., Nishihori, T., Brayer, J., Cleveland, J., Dalton, W., Walker, C., Landesman, Y., Baz, R., Silva, A., Shain, K. H., “The Functional Transcriptomic Landscape Informs Therapeutic Strategies in Multiple Myeloma,” <i>Cancer Research</i>, 2025, 85 (2), pp. 378 – 398. 2. Sudalagunta, P. R., Silva, M. C., Canevarolo, R. R., Alugubelli, R. R., De Avila, G., Tungesvik, A., Perez, L., Gatenby, R., Gillies, R., Meads, M. B., Shain, K. H., Silva, A., “Pharmacodynamic Model of Clinical Synergy in Multiple Myeloma,” <i>eBioMedicine</i>, 2020, 102716.

	<p>3. Sudalagunta, P. R., Sultan, C., Kapania, R., Watson, L. W., and Raj, P., “Aeroelastic Control-oriented Modeling of an Air-breathing Hypersonic Vehicle,” <i>AIAA Journal of Guidance, Control, and Dynamics</i>, Vol. 41, No. 5 (2018), pp. 1136 – 1149.</p> <p>4. Sudalagunta, P. R., Sultan, C., Kapania, R., Watson, L. W., and Raj, P., “Accurate Computing of Higher Vibration Modes of Thin Flexible Structures,” <i>AIAA Journal</i>, Vol. 54, No. 5 (2016), pp. 1704 – 1718.</p>
<p>MENTORED PUBLICATIONS:</p>	<p>5. Jiang, Q., Meads, M. B., Zhao, X., Achille, A., Noyes, D., Silva, M. C., Canevarolo, R. R., Shain, K. H., Silva, A., Sudalagunta, P. R., Zhang, W., “TLCellClassifier: Machine Learning Based Cell Classification for Bright-Field Time-Lapse Images,” <i>IEEE Transactions on Medical Imaging</i> (under review).</p> <p>6. Jiang, Q., Sudalagunta, P. R., Silva, M. C., Canevarolo, R. R., Alugubelli, R. R., De Avila, G., Tungesvik, A., Perez, L., Gatenby, R., Gillies, R., Meads, M. B., Shain, K. H., Silva, A., Zhang, W., “CancerCellTracker: A Brightfield Time-lapse Microscopy Framework for Cancer Drug Sensitivity Estimation,” <i>Bioinformatics</i>, Vol. 38, No. 16 (2022), pp. 4002 – 4010.</p>
<p>CO-AUTHORED JOURNAL PUBLICATIONS:</p>	<p>7. Tauro, M., Li, T., Sudalagunta, P. R., Meads, M., Alugubelli, R., Lawrence, N. J., Lawrence, H., Gunawan, S., Tran, T. H., Shay, G., Schonbrunn, E., Bishop, R. T., Nasr, M., Cleveland, J. L., Silva, A. S., Shain, K. H., Lynch, C. Unc-51 Like Kinase 3 (ULK3) is a novel mediator of autophagy and cell viability in multiple myeloma. <i>Science Translational Medicine</i> (revised manuscript pending resubmission).</p> <p>8. Bishop, R. T., Li, T., Sudalagunta, P. R., Nasr, M., Nyman, K., Alugubelli, R., Meads, M., Frieling, J., Nerlakanti, N., Tauro, M., Fang, B., Grant, S., Koomen, J., Silva, A., Shain, K. H., Lynch, C., Acid ceramidase controls proteasome inhibitor resistance and is a novel therapeutic target for the treatment of relapsed / refractory multiple myeloma. <i>Hematologica</i>.</p> <p>9. Bishop, R. T., Miller, A. K., Froid, M., Nerlakanti, N., Li, T., Frieling, J., Nasr, M., Nyman, K., Sudalagunta, P. R., Canevarolo, R. R., Silva, A. S., Shain, K. H., Lynch, C., Basanta, D. The bone ecosystem facilitates multiple myeloma relapse and the evolution of heterogeneous proteasome inhibitor resistant disease. <i>Nature Communications</i> 15, 2458 (2024).</p> <p>10. Canevarolo RR, Sudalagunta, P. R., Meads, M. B., Silva, M., Zhao, X., Magaletti, D., Alugubelli, R. R., DeAvila, G., Persi, E., Maura, F., Bell ET, Bishop, R., Cubitt, C., Sansil, S., Zhang, W., Teer, J., Teng, M., Yoder, S., Siegel, E., Shah, B., Nishihori, T., Hazlehurst, L., Lynch, C., Landgren, O., Hampton, O., Gatenby, R., Sullivan, D., Brayer, J., Dalton, W., Cleveland, J. L., Alsina, M., Baz, R., Shain, K. H., Silva, A. S. Epigenetic Plasticity Drives Carcinogenesis and Multi-Therapy Resistance in Multiple Myeloma. <i>Nature Communications</i> (under review).</p> <p>11. Burger K, Fernandez M, Meads MB, Sudalagunta P.R., Oliveira P, Canevarolo RR, Alugubelli RR, Tungesvik A, Avila G, Silva M, Graeter A, Dai H, Vinceletti N, Prabhu A, Magaletti D, Yang C, Li W, Kulkarni A, Hampton O, Koomen J, Roush W, Monastyrskiy A, Berglund A, Silva AS, Cleveland J, Shain KH. CK1δ/CK1ε Signaling Sustains Mitochondrial Metabolism and Cell Survival in Multiple Myeloma. <i>Cancer Research</i> 2023.</p> <p>12. Mostofa, A. G. M., Distler, A., Meads, M. B., Sahakian, E., Powers, J. J., Achille, A., Noyes, D., Wright, G., Fang, B., Izumi, V., Koomen, J., Ramakrishnan R., Nguyen, T. P., De Avila, G., Silva, A. S., Sudalagunta, P., Canevarolo, R. R., Silva, M. C., Alugubelli, R. R., Dai, H. A., Kulkarni, A., Dalton, W. S., Hampton, O. A., Welsh, E. A., Teer, J. K., Tungesvik, A., Wright, K. L., Pinilla-Ibarz, J., Sotomayor, E. M., Shain, K. H., and Brayer, J., “Plasma cell dependence on histone/protein deacetylase 11 reveals a therapeutic target in multiple myeloma”. <i>JCI Insight</i>, Volume 6, Issue 24, 2021. DOI: 10.1172/jci.insight.151713.</p> <p>13. Zhou, L., Zhang, Y., Meads, M. B., Dai, Y., Ning, Y., Hu, X., Li, L., Sharma, K., Nkwocha, J., Parker, R., Bui D., McCarter, J., Kramer, L., Purcell, C., Sudalagunta, P. R., Canevarolo, R. R., Silva, M. C., DeAvila, G., Alugubelli, R. R., Silva, A. S., Kmiecik, M., Ferreira-Gonzalez, A., Shain, K. H., Grant, S, “IAP and HDAC inhibitors interact synergistically in myeloma cells through noncanonical NF-κB– and caspase-8–dependent mechanisms”. <i>Blood Adv</i> 2021, Volume 5, Issue 19, pp. 3776–3788. DOI: 10.1182/bloodadvances.2020003597.</p> <p>14. Zhao, X., Ren, Y., Lawlor, M., Shah, B. D., Park, P. M. C., Lwin, T., Wang, X., Liu, K., Wang, M., Gao, Jing., Li, T., Xu, M., Silva, A. S., Lee, K., Zhang, T., Koomen, J. M., Jiang, H., Sudalagunta, P. R., Meads, M. B., Cheng, F., Bi, C., Fu, K., Fan, H., Dalton, W.,</p>

	<p>Moscinski, L., Shain, K. H., Sotomayor, E., Wang, G. G., Gray, N. S., Cleveland, J. L., Qi, J., Tao, J., "BCL2 Amplicon Loss and Transcriptional Remodeling Drives ABT-199 Resistance in B Cell Lymphoma Models", <i>Cancer Cell</i>, Volume 35, Issue 5, 2019, pp. 752 – 766.</p> <p>15. Ren, Y., Bi, C., Zhao, X., Lwin, T., Wang, C., Yuan, J., Silva, A. S., Shah, B. D., Fang, B., Li, T., Koomen, J., Jiang, H., Chavez, J., Pham, L., Sudalagunta, P. R., Wan, L., Wang, X., Dalton, W., Moscinski, L., Shain, K. H., Vose, J., Cleveland, J. L., Sotomayor, E., Fu, K., Tao, J., "PLK1 stabilizes a MYC-dependent kinase network in aggressive B cell lymphomas", <i>Journal of Clinical Investigation</i>, Vol. 128, No. 12 (2018), pp. 5517 – 5530.</p> <p>16. Silva, A., Silva, M. C., Sudalagunta P., Distler, A., Jacobson, T., Collins, A., Nguyen, T., Song, T., Chen, D., Chen, L., Cubitt C., Baz, R., Perez, L., Rebatchouk, D., Dalton, W., Greene, J., Gatenby, R., Gillies, R., Sontag, E., Meads, M. B., and Shain, K. H., "An Ex Vivo Platform for the Prediction of Clinical Response in Multiple Myeloma", <i>Cancer Research</i>, Vol. 77, No. 12 (2017), pp. 3336 – 3351.</p>
<p>SERVICE ACTIVITIES:</p>	<ul style="list-style-type: none"> ➤ EDITORIAL: Reviewed 24 publications. <ul style="list-style-type: none"> ❖ Editorial Board Member, Frontiers in Pharmacology & Frontiers in Bioinformatics ❖ Reviewer, Nature Communications, Frontiers in Pharmacology, Frontiers in Immunology, IEEE Transactions on Automatic Control, Nonlinear Dynamics, AIAA Journal, IEEE Transactions on Intelligent Transportation Systems, American Control Conference, IEEE Conference on Decision and Control, and ASME Dynamic Systems and Control Conference. ➤ Grant Reviewer, Multiple Myeloma Research Foundation (MMRF) Research Fellowship Award 2021 – 2023. ➤ Planning Committee Member, NCI Physical Sciences-Oncology Network (PS-ON) and Cancer Systems Biology Consortium (CSBC) Annual Junior Investigator (JI) Meeting 2019. ➤ COMMUNITY SERVICE: <ul style="list-style-type: none"> ❖ Hospice Volunteer, LifePath Hospice – Chapters Health System, Tampa, FL (2017 – 2019) <ul style="list-style-type: none"> ▪ Provide companionship to patients under end-of-life hospice care by making weekly visits to a nursing home. ❖ Para-professional Phone Counsellor, RAFT Crisis Hotline, New River Valley Community Services (2015 – 2016) <ul style="list-style-type: none"> ▪ Certified to provide Mental Health First Aid ▪ Volunteer of the Month Award: January 2016 & Life Saver Award, 2016 ➤ SERVICE @ MOFFITT: <ul style="list-style-type: none"> ❖ Service Committee Chair (2019 – 2020), Moffitt Postdoctoral Association, Moffitt Cancer Center & Research Institute, Tampa, FL. ❖ Biked 325 miles on a bicycle from Tampa to Tallahassee for annual Moffitt Day 2019 – 2021 at the Florida State Capitol to advocate for continued support towards cancer research from the state of Florida.