

James Robert White PhD

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Expertise in Computational Biology, Bioinformatics & Biostatistics

Computing

Perl / R / Python
Linux HPC / AWS

Microbiome

16S rRNA amplicon
Metagenomics
Metatranscriptomics
Metabolomics
Bacterial genomics
Phylogenetics
qPCR design

Cancer Genomics

Targeted-tissue
Targeted-plasma
ctDNA / cfDNA
Whole-exome
Mutational burden
Mutational signatures
HLA typing
Neoantigen analysis
RNA-seq
TCR-seq

Biostatistics

Machine learning
Biomarker discovery
IVD V&V studies
Regression
Survival analysis
Ordination methods
Longitudinal analysis
Power analysis

Experience

January 2014 – Present

Founder | Resphera Biosciences

Resphera Biosciences is developing innovative computational and statistical approaches to next-generation DNA sequence analysis to help advance translational research in the fields of microbiome, cancer genomics and immunology.

June 2011 – Present

Independent contractor

Research specialist in computational biology and statistical analysis

June 2010 – April 2013

Bioinformatics software engineer II – The Institute for Genome Sciences – University of Maryland School of Medicine
Development of automated cloud-based bioinformatics pipelines for microbiome and other multi-omics datasets

May 2008 – August 2008

Neural prosthetics algorithms group – Johns Hopkins Applied Physics Lab

Designed and implemented decision fusion framework (Kalman filtering and artificial neural networks) for multimodal neural prosthetic devices (DARPA-sponsored)

May 2007 – May 2010

Metagenomics research group – University of Maryland College Park

Development of novel statistical methods for comparative and longitudinal metagenomic data analysis

Education

University of Maryland – College Park, 2006 – 2010

Ph.D. Applied Mathematics and Scientific Computation – May 2010

University of Maryland – College Park, 2002 – 2006

B.S. *summa cum laude*, Mathematics – May 2006

Publications

1. Diplas BH, Ptashkin R, Chou JF, Sabwa S, Foote MB, Rousseau B, Argilés G, White JR, Stewart CM, Bolton K, Chalasani SB, Diaz JA, Maron SB. **Clinical Importance of Clonal Hematopoiesis in Metastatic Gastrointestinal Tract Cancers.** *JAMA Network Open.* 6:2, February 2023.
2. Scharpf RB, Balan A, Ricciuti B, Fiksel J, Cherry C, Wang C, Lenoue-Newton ML, Rizvi HA, White JR, Baras AS, Anaya J, Anagnostou V. **Genomic Landscapes and Hallmarks of Mutant RAS in Human Cancers.** *Cancer Research.* 82:21, November 2022.
3. Seshadri R, Roux S, Huber KJ, Wu D, Yu S, Udway D, Call L, Nayfach S, Hahnke RL, Pukall R, White JR, Ivanova

- N. **Expanding the genomic encyclopedia of Actinobacteria with 824 isolate reference genomes.** *Cell Genomics*. 100213, November 2022.
4. Matute JD, Duan J, Flak MB, Griebel P, Tascon-Arcila JA, Doms S, Hanley T, Antanaviciute A, Gundrum J, Mark Welch JL, Sit B, Abtahi S, Fuhler G, Grootjans J, Tran F, Stengel S, White JR, Blumberg RS. **Intelectin-1 binds and alters the localization of the mucus barrier-modifying bacterium *Akkermansia muciniphila*.** *Journal of Experimental Medicine*. 220:1, November 2022.
 5. Peiffer LB, White JR, Jones CB, Slottke RE, Ernst SE, Moran AE, Graff JN, Sfanos KS. **Composition of gastrointestinal microbiota in association with treatment response in individuals with metastatic castrate resistant prostate cancer progressing on enzalutamide and initiating treatment with anti-PD-1 (pembrolizumab).** *Neoplasia*. 32:100822, October 2022.
 6. Ling W, Lu J, Zhao N, Lulla A, Plantinga AM, Fu W, Zhang A, Liu H, Song H, Li Z, Chen J, Randolph T, Koay W, White JR, Wu M. **Batch effects removal for microbiome data via conditional quantile regression.** *Nature Communications*. 13:1, September 2022.
 7. Wan J, Stephens D, Luo L, White JR, Stewart CM, Rousseau B, Tsui DW, Diaz LA. **Genome-wide mutational signatures in low-coverage whole genome sequencing of cell-free DNA.** *Nature Communications*. 13:1, August 2022.
 8. Drewes JL, Chen J, Markham NO, Knippel RJ, Domingue JC, Tam AJ, Chan JL, Kim L, McMann M, Stevens C, Dejea CM, Tomkovich S, Michel J, White JR, Sears CL. **Human colon cancer-derived *Clostridioides difficile* strains drive colonic tumorigenesis in mice.** *Cancer Discovery*. 12:8, June 2022.
 9. Hwang M, Canzoniero JV, Rosner S, Zhang G, White JR, Belcaid Z, Cherry C, Balan A, Pereira G, Curry A, Niknafs N, Anagnostou V. **Peripheral blood immune cell dynamics reflect antitumor immune responses and predict clinical response to immunotherapy.** *Journal for Immunotherapy of Cancer*. 10:6, June 2022.
 10. Botsis T, Murray J, Alessandro LE, Palsgrove D, Wei WA, White JR, Velculescu VE, Anagnostou V, Johns Hopkins Molecular Tumor Board Investigators. **Natural Language Processing Approaches for Retrieval of Clinically Relevant Genomic Information in Cancer.** *Studies in health technology and informatics*. 295:350, June 2022.
 11. Keefer LA, White JR, Wood D, Gerding K, Valkenburg K, Riley D, Gault C, Papp E, Vollmer C, Greer A, Hernandez J, McGregor P, Zingone A, Ryan B, Deak K, McCall S, Datto M, Prescott J, Thompson J, Cerqueira G, Jones S, Simmons J, McElhinny A, Dickey J, Anguili SA, Diaz LA, Velculescu VE, Sausen M. **Automated next-generation profiling of genomic alterations in human cancers.** *Nature Communications*. 13:2830, May 2022.
 12. Xue J, Rieg JA, Thomas L, White JR, Rieg T. **Intestine-Specific NHE3 Deletion in Adulthood Causes Microbial Dysbiosis.** *Frontiers in Cellular and Infection Microbiology*. 12, May 2022.
 13. Shao XM, Huang J, Niknafs N, Balan A, Cherry C, White JR, Velculescu VE, Anagnostou V, Karchin R. **HLA class II immunogenic mutation burden predicts response to immune checkpoint blockade.** *Annals of Oncology*. 10.1016/j.annonc.2022.03.013, March 2022.
 14. Jones CB, White JR, Ernst SE, Sfanos KS, Peiffer LB. **Incorporation of Data From Multiple Hypervariable Regions when Analyzing Bacterial 16S rRNA Gene Sequencing Data.** *Frontiers in Genetics*. 13:799615, March 2022.
 15. Shaikh FY, Gills JJ, Mohammad F, White JR, Stevens CM, Ding H, Fu J, Tam A, Blosser RL, Domingue JC, Larman T, Chaff J, Spicer J, Reuss J, Naidoo J, Forde P, Ganguly S, Housseau F, Pardoll D, Sears CL. **Murine fecal microbiota transfer models selectively colonize human microbes and reveal transcriptional programs associated with response to neoadjuvant checkpoint inhibitors.** *Cancer Immunology Immunotherapy*. 10.1007/s00262-022-03169-6, February 2022.
 16. Queen J, Domingue JC, White JR, Stevens C, Udayasuryan B, Nguyen TT, Wu S, Ding H, Fan H, McMann M, Corona A, Larman T, Verbridge S, Housseau F, Slade D, Drewes J, Sears CL. **Comparative Analysis of Colon Cancer-Derived *Fusobacterium nucleatum* Subspecies: Inflammation and Colon Tumorigenesis in Murine Models.** *Mbio*. 13:1, February 2022.
 17. Forde PM, Anagnostou V, Sun Z, Dahlberg SE, Kindler HL, Niknafs N, Purcell T, Santana-Davila R, Dudek A, Borghaei H, Lanis M, Belcaid Z, Smith K, Balan A, White JR, Cherry C, Sivakumar A, Shao X, Chan H, Singh D, Thapa S, Illei P, Pardoll D, Karchin R, Velculescu VE, Brahmer J, Ramalingam SS. **Durvalumab with platinum-pemetrexed for unresectable pleural mesothelioma: survival, genomic and immunologic analyses from the phase 2 PrE0505 trial.** *Nature Medicine*. 27:11, November 2021.
 18. Zhao N, Khamash DF, Koh H, Voskertchian A, Egbert E, Mongodin EF, White JR, Hittle L, Colantuoni E, Milstone AM. **Low Diversity in Nasal Microbiome Associated with *Staphylococcus aureus* Colonization and Bloodstream Infections in Hospitalized Neonates.** *Open Forum Infectious Diseases*. 8:10, October 2021.
 19. Mathios D, Johansen JS, Cristiano S, Medina JE, Phallen J, Larsen KR, Bruhm DC, Niknafs N, Ferreira L, Adleff V, Chiao JY, Leal A, Noe M, White JR, Arun AS, Hruban C, Annapragada AV, Jensen S, Orntoft MW, Madsen AH, Carvalho B, de Wit M, Carey J, Dracopoli NC, Maddala T, Fang KC, Hartman AR, Forde PM, Anagnostou V, Brahmer J, Fijneman R, Nielsen H, Meijer G, Andersen C, Møller A, Bojesen S, Scharpf R, Velculescu VE.

- Detection and characterization of lung cancer using cell-free DNA fragmentomes.** *Nature Communications*. 12:1, August 2021.
20. Foote MB, White JR, Jee J, Argilés G, Wan JC, Rousseau B, Pessin MS, Diaz LA. **Association of Antineoplastic Therapy With Decreased SARS-CoV-2 Infection Rates in Patients With Cancer.** *JAMA Oncology*. doi:10.1001/jamaoncol.2021.3585, August 2021.
 21. Shields CE, White JR, Chung L, Wenzel A, Hicks JL, Tam AJ, Chan JL, Dejea CM, Fan H, Michel J, Maiuri AR, Sriramkumar S, Podicheti R, Rusch DB, Wang H, De Marzo AM, Besharati S, Anders RA, Baylin SB, O'Hagan HM, Housseau F, Sears CL. **Bacterial-driven inflammation and mutant BRAF expression combine to promote murine colon tumorigenesis that is sensitive to immune checkpoint therapy.** *Cancer Discovery*. 11:1, June 2021.
 22. Shaikh FY, White JR, Gills JJ, Hakozaki T, Richard C, Routy B, Okuma Y, Usyk M, Pandey A, Weber JS, Ahn J, Lipson EJ, Naidoo J, Pardoll DM, Sears CL. **A Uniform Computational Approach Improved on Existing Pipelines to Reveal Microbiome Biomarkers of Nonresponse to Immune Checkpoint Inhibitors.** *Clinical Cancer Research*. 27:9, May 2021.
 23. Shatkin-Margolis A, White JR, Jedlicka AE, Tam T, Hill A, Yeung J, Crisp CC, Pauls RN. **The effect of mindfulness-based stress reduction on the urinary microbiome in interstitial cystitis.** *International Urogynecology Journal*. 15:1, May 2021.
 24. Noel S, Mohammad F, White JR, Lee K, Gharai S, Rabb H. **Gut microbiota-immune system interactions during acute kidney injury.** *Kidney360*. 2:3, March 2021.
 25. Anagnostou V, Bruhm DC, Niknafs N, White JR, Shao XM, Sidhom JW, Stein J, Tsai HL, Wang H, Belcaid Z, Murray J, Balan A, Ferreira L, Ross-Macdonald P, Wind-Rotolo M, Baras AS, Taube J, Karchin R, Scharpf RB, Grasso C, Ribas A, Pardoll DM, Topalian SL, Velculescu VE. **Integrative Tumor and Immune Cell Multi-omic Analyses Predict Response to Immune Checkpoint Blockade in Melanoma.** *Cell Reports Medicine*. 1:8, November 2020.
 26. Reuss JE, Anagnostou V, Cottrell TR, Smith KN, Verde F, Zahurak M, Lanis M, Murray JC, Chan HY, McCarthy C, Wang D, White JR, Yang S, Battafarano R, Broderick S, Bush E, Brock M, Ha J, Jones D, Merghoub T, Taube J, Velculescu VE, Rosner G, Illei P, Pardoll DM, Topalian S, Naidoo J, Levy B, Hellmann MD, Brahmer JR, Chaft JE, Forde PM. **Neoadjuvant nivolumab plus ipilimumab in resectable non-small cell lung cancer.** *Journal for Immunotherapy of Cancer*. 8:2, September 2020.
 27. White JR, Foote MB, Jee J, Argilés G, Wan JM, Diaz LA. **PI3K/mTOR and topoisomerase inhibitors with potential activity against SARS-CoV-2 infection.** *medRxiv [pre-print]*. doi.org/10.1101/2020.09.02.20186783, September 2020.
 28. Banerjee A, Herring CA, Chen B, Kim H, Simmons AJ, Southard-Smith AN, Allaman MM, White JR, Macedonia MC, Mckinley ET, Solano MA, Scoville E, Liu Q, Wilson K, Coffey R, Washington M, Goettel J, Lau K. **Succinate Produced by Intestinal Microbes Promotes Specification of Tuft Cells to Suppress Ileal Inflammation.** *Gastroenterology*. doi.org/10.1053/j.gastro.2020.08.029, August 2020.
 29. Noë M, Niknafs N, Fischer CG, Hackeng WM, Guthrie VB, Hosoda W, Debeljak M, Papp E, Adleff V, White JR, Luchini C, Pea A, Scarpa A, Butturini G, Zamboni G, Castelli P, Hong S, Yachida S, Hiraoka N, Gill A, Samra J, Offerhaus G, Hoorens A, Verheij J, Jansen C, Adsay N, Jiang W, Winter J, Albores-Saavedra J, Terris B, Thompson E, Roberts N, Hruban R, Karchin R, Scharpf R, Brosens L, Velculescu V, Wood L. **Genomic characterization of malignant progression in neoplastic pancreatic cysts.** *Nature Communications*. 11:1, August 2020.
 30. Merino DM, McShane LM, Fabrizio D, Funari V, Chen SJ, White JR, Wenz P, Baden J, Barrett JC, Chaudhary R, Chen L, Chen W, Cheng J, Cyanam D, Dickey J, Gupta V, Hellmann M, Helman E, Li Y, Maas J, Papin A, Patidar R, Quinn K, Rizvi N, Tae H, Ward C, Xie M, Zehir A, Zhao C, Dietel M, Stenzinger A, Stewart M, Allen J. **Establishing guidelines to harmonize tumor mutational burden (TMB): in silico assessment of variation in TMB quantification across diagnostic platforms: phase I of the Friends of Cancer Research TMB Harmonization Project.** *Journal for Immunotherapy of Cancer*. 8:1, March 2020.
 31. Labriola MK, Zhu J, Gupta R, McCall S, Jackson J, Kong EF, White JR, Cerqueira G, Gerding K, Simmons JK, George D, Zhang T. **Characterization of tumor mutation burden, PD-L1 and DNA repair genes to assess relationship to immune checkpoint inhibitors response in metastatic renal cell carcinoma.** *Journal for Immunotherapy of Cancer*. 8:1, March 2020.
 32. Velculescu V, Zhang T, White JR, Diaz L (inventors); Personal Genome Diagnostics Inc, assignee. **Neoantigen treatment prioritization using multivariate analysis based on: HLA genotype, self-similarity, similarity to known antigens, antigen expression levels and mutant allele frequency.** *United States Patent*. US 10,563,266, February 2020.
 33. Liss MA, Chen Y, Rodriguez R, Pruthi D, Johnson-Pais T, Wang H, Mansour A, White JR, Kaushik D. **Microbiome within Primary Tumor Tissue from Renal Cell Carcinoma May Be Associated with PD-L1 Expression of the Venous Tumor Thrombus.** *Advances in Urology*. 2020:9068068, February 2020.
 34. Anagnostou V, Niknafs N, Marrone K, Bruhm DC, White JR, Naidoo J, Hummelink K, Monkhorst K, Lalezari F, Lanis

- M, Rosner S, Reuss J, Smith K, Adleff V, Rodgers K, Belcaid Z, Rhymee L, Levy B, Feliciano J, Hann C, Ettinger D, Georgiades C, Verde F, Illei P, Li Q, Baras A, Gabrielson E, Brock M, Karchin R, Pardoll D, Baylin S, Brahmer J, Scharpf R, Forde P, Velculescu V. **Multimodal genomic features predict outcome of immune checkpoint blockade in non-small-cell lung cancer.** *Nature Cancer*. 1:1, January 2020.
35. Zhang A, Sodhi C, Wang M, Shores D, Fulton W, Prindle T, Brosten S, O'Hare E, Lau A, Ding H, Jia H, Lu P, White JR, Hui J, Sears C, Hackam D, Alaish S. **A Central Role for Lipocalin-2 in the Adaptation to Short Bowel Syndrome through Downregulation of IL-22 in Mice.** *Cellular and Molecular Gastroenterology and Hepatology*. 10:2, January 2020.
 36. De Groot AS, Skowron G, White JR, Boyle C, Richard G, Serreze D, Martin WD. **Therapeutic Administration of Tregitope-Human Albumin Fusion with Insulin Peptides to Promote Antigen-Specific Adaptive Tolerance Induction.** *Scientific Reports*. 9:1, November 2019.
 37. Georgiades A, Durham JN, Keefer LA, Bartlett BR, Zielonka M, Murphy D, White JR, Lu S, Verner EL, Ruan F, Riley D, Anders RA, Gedvilaite E, Angiuoli S, Jones S, Velculescu VE, Le DT, Diaz Jr LA, Sausen M. **Noninvasive Detection of Microsatellite Instability and High Tumor Mutation Burden in Cancer Patients Treated with PD-1 Blockade.** *Clinical Cancer Research*. doi.10.1158/1078-0432.CCR-19-1372, September 2019.
 38. Riquelme E, Zhang Y, Zhang L, Montiel M, Zoltan M, Dong W, Quesada P, Sahin I, Chandra V, San Lucas A, Scheet P, Xu H, Hanash SM, Feng L, Burks JK, Do KA, Peterson CB, Nejman D, Tzeng CD, Kim MP, Sears CL, Ajami N, Petrosino J, Wood LD, Maitra A, Straussman R, Katz M, White JR, Jenq R, Wargo J, McAllister F. **Tumor Microbiome Diversity and Composition Influence Pancreatic Cancer Outcomes.** *Cell*. 178:4, August 2019.
 39. Wan JC, White JR, Diaz Jr LA. **Hey CIRI, What's My Prognosis?** *Cell*. 178:3, July 2019.
 40. Cristiano S, Leal A, Phallen J, Fiksel J, Adleff V, Bruhm DC, Jensen S, Medina JE, Hruban C, White JR, Palsgrove DN, Niknafs N, Anagnostou V, Forde P, Naidoo J, Marrone K, Brahmer J, Woodward BD, Husain H, van Rooijen KL, Ørntoft AH, van de Velde CJ, Verheij M, Cats A, Punt CJ, Vink GR, van Grieken NC, Koopman M, Fijneman RJ, Johansen JS, Nielsen HJ, Meijer GA, Andersen CL, Scharpf RB, Velculescu VE. **Genome-wide cell-free DNA fragmentation in patients with cancer.** *Nature*. doi.org/10.1038/s41586-019-1272-6, May 2019.
 41. Tuddenham SA, Koay WL, Zhao N, White JR, Ghanem KG, Sears CL. **The Impact of HIV Infection on Gut Microbiota Alpha-Diversity: An Individual Level Meta-analysis.** *Clinical Infectious Diseases*. doi.10.1093/cid/ciz258, March 2019.
 42. Anagnostou V, Forde PM, White JR, Niknafs N, Hruban C, Naidoo J, Marrone K, Sivakumar A, Bruhm DC, Rosner S, Phallen J, Leal A, Adleff V, Smith KN, Cottrell TR, Rhymee L, Palsgrove DN, Hann CL, Levy B, Feliciano J, Georgiades C, Verde F, Illei P, Li QK, Gabrielson E, Brock MV, Isbell JM, Sauter JL, Taube J, Scharpf RB, Karchin R, Pardoll DM, Chaft JE, Hellmann MD, Brahmer JR, Velculescu VE. **Dynamics of Tumor and Immune Responses during Immune Checkpoint Blockade in Non-Small Cell Lung Cancer.** *Cancer Research*. 79:6, March 2019.
 43. Tomkovich S, Dejea CM, Winglee K, Drewes JL, Chung L, Housseau F, Pope JL, Gauthier J, Sun X, Mühlbauer M, Liu X, Fathi P, Anders RA, Besharati S, Perez-Chanona E, Yang Y, Ding H, Wu X, Wu S, White JR, Gharaibeh RZ, Fodor AA, Wang H, Pardoll DM, Jobin C, Sears CL. **Human colon mucosal biofilms from healthy or colon cancer hosts are carcinogenic.** *Journal of Clinical Investigation*. 129:4, March 2019.
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 45. Greathouse KL, White JR, Padgett RN, Perrotta BG, Jenkins GD, Chia N, Chen J. **Gut microbiome meta-analysis reveals dysbiosis is independent of body mass index in predicting risk of obesity-associated CRC.** *BMJ Open Gastroenterology*. 6:1, February 2019.
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 47. Bodogai M, O'connell J, Kim K, Kim Y, Moritoh K, Chen C, Gusev F, Vaughan K, Shulzhenko N, Mattison JA, Lee-Chang C, Chen W, Carlson O, Becker K, Gurung M, Morgun A, White JR, Meade T, Perdue K, Mack M, Ferrucci L, Trinchieri G, de Cabo R, Rogaev E, Egan J, Wu J, Biragyn A. **Commensal bacteria contribute to insulin resistance in aging by activating innate B1a cells.** *Science Translational Medicine*. 14:10, November 2018.
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 50. Angiuoli SV, White JR, Jones S. **Regarding the Congruence Between 2 Circulating Tumor DNA Sequencing**

Assays. *JAMA Oncology*. 4:10, October 2018.

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52. Chen IM, Chu K, Palaniappan K, Pillay M, Ratner A, Huang J, Huntemann M, Varghese N, White JR, Seshadri R, Smirnova T. **IMG/M v. 5.0: an integrated data management and comparative analysis system for microbial genomes and microbiomes.** *Nucleic Acids Research*. 47:D1, October 2018.
53. Jarvis KG, Daquigan N, White JR, Morin PM, Howard LM, Manetas JE, Ottesen A, Ramachandran P, Grim CJ. **Microbiomes associated with foods from plant and animal sources.** *Frontiers in Microbiology*. 9, October 2018.
54. Wood DE, White JR, Georgiadis A, Van Emburgh B, Parpart-Li S, Mitchell J, Anagnostou V, Niknafs N, Karchin R, Papp E, McCord C, LoVerso P, Riley D, Diaz LA, Jones S, Sausen M, Velculescu VE, Angiuoli SV. **A machine learning approach for somatic mutation discovery.** *Science Translational Medicine*. 10:457, September 2018.
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