Timothy J. O'Donnell

New York, NY
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EDUCATION

Ph.D. in Biomedical Sciences

Icahn School of Medicine at Mount Sinai. New York, NY, USA
Advisor: Uri Laserson, Ph.D.
Dissertation title: "A model of antigen processing improves prediction of MHC I-presented peptides"
Aug. 2017 – Sept. 2020

Bachelor of Science in Mathematics & Computer Science

Brown University. Providence, RI, USA
Sept. 2005 – May 2009

EMPLOYMENT

Technology Specialist IV

Icahn School of Medicine at Mount Sinai. New York, NY, USA
Hammerbacher Lab, Jan. 2014 – Dec. 2017.
OpenVax group, Jan. 2018 – present.
Tisch Cancer Institute, July 2020 – present.

Associate Research Scientist

D.E. Shaw Research. New York, NY, USA
Aug. 2009 – Jan. 2014.

PUBLICATIONS

Lopez-Bujanda Z, Obradovic A, Nirschl T, Crowley L, Macedo R, Papachristodoulou A, **O'Donnell T**, Laserson U, Zarif J, Reshef R, Yuan T, Soni M, Antonarakis S, Haffner M, Larman HB, Shen M, Muranski P, Drake C. TGM4: an immunogenic prostate-restricted antigen. *Journal for ImmunoTherapy of Cancer.* 2021. doi:10.1136/jitc-2020-001649

Smith C, Olsen K, Gentry K, Sambade M, Beck W, Garness J, Entwistle S, Willis C, Vensko S, Woods A, Fini M, Carpenter B, Routh E, Kodysh J, **O'Donnell T**, Haber C, Heiss K, Stadler V, Garrison E, Sandor A, Ting J, Weiss J, Krajewski K, Grant O, Woods R, Heise M, Vincent B, Rubinsteyn A. Landscape and selection of vaccine epitopes in SARS-CoV-2. *Genome Medicine.* 2021. doi:10.1186/s13073-021-00910-1

Roudko V, Cimen Bozkus C, Orfanelli T, McClain C, Carr C, **O'Donnell T**, Chakraborty L, Samstein R, Huang K, Blank S, Greenbaum B, Bhardwaj N. Shared Immunogenic Poly-Epitope Frameshift Mutations in Microsatellite Unstable Tumors. *Cell.* 2020. doi:10.1016/j.cell.2020.11.004

Gruber C, Patel R S, Trachtman R, Lepow L, Amanat F, Krammer F, Wilson K M, Onel K, Geanon D, Tuballes K, Patel M, Mouskas K, **O'Donnell T**, Merritt E, Simons N, Barcessat V, Del Valle D M, Udondem S, Kang G, Gangadharan S, Ofori-Amanfo G, Laserson U, Rahman A, Kim-Schulze S, Charney A, Gnjatic S, Gelb B D, Merad M, Bogunovic D. Mapping systemic inflammation and antibody responses in multisystem inflammatory syndrome in children (MIS-C). *Cell*. 2020. doi:10.1016/j.cell.2020.09.034

Cantarelli C, Jarque M, Angeletti A, Manrique J, Hartzell S, **O'Donnell T**, Merritt E, Laserson U, Perin L, Donadei C, Anderson L, Fischman C, Chan E, Draibe J, Fulladosa X, Torras J, Riella LV, La Manna G, Fiaccadori E, Maggiore U, Bestard O, Cravedi P. A comprehensive phenotypic and functional immune analysis unravels circulating anti-PLA2R antibody secreting cells in membranous nephropathy patients. *Kidney International Reports*. 2020. doi:10.1016/j.ekir.2020.07.028.

O'Donnell T, Rubinsteyn A, Laserson U. MHCflurry 2.0: Improved Pan-Allele Prediction of MHC Class I-Presented Peptides by Incorporating Antigen Processing. *Cell Systems*. 2020. doi:10.1016/j.cels.2020.06.010.

O'Donnell T, Rubinsteyn A, Bonsack M, Riemer AB, Laserson U, Hammerbacher J. MHCflurry: Open-Source Class I MHC Binding Affinity Prediction. *Cell Systems.* 2018. doi:10.1016/j.cels.2018.05.014.

O'Donnell T, Christie EL, Ahuja A, et al. Chemotherapy weakly contributes to predicted neoantigen expression in ovarian cancer. *BMC Cancer*. 2018;18(1):87. doi:10.1186/s12885-017-3825-0.

Pak TR, Chacko KI, **O'Donnell T**, et al. Estimating Local Costs Associated with Clostridium difficile Infection Using Machine Learning and Electronic Medical Records. *Infect Control Hosp Epidemiol*. 2017;38(12):1478-1486. doi:10.1017/ice.2017.214.

Xu H, Schmidt AG, **O'Donnell T**, et al. Key mutations stabilize antigen-binding conformation during affinity maturation of a broadly neutralizing influenza antibody lineage. *Proteins*. 2014. doi:10.1002/prot.24745.

Schmidt A. G, Xu H, Khan A. R, **O'Donnell T.**, et al. Preconfiguration of the antigen-binding site during affinity maturation of a broadly neutralizing influenza virus antibody. *Proc Natl Acad Sci*. 2013. doi:10.1073/pnas.1218256109.

INVITED TALKS

"Predicting MHC Ligands." Chodera Lab, Memorial Sloan Kettering Cancer Center. New York, NY. April 2018.

"Software for tumor neoantigen prediction and vaccine design." Neoantigen Summit. Boston, MA. November 2016. [slides]

"Tumor neoantigen prediction." Littman Lab, NYU. New York, NY. October 2016.

"Dipping into guacamole: a new somatic variant caller." NYC Big Data Genetics Meetup. New York, NY. August 2016. [slides]

"Developing a cloud-based neoepitope prediction pipeline." Parker Institute for Cancer Immunotherapy Informatics Retreat. San Francisco, CA. July 2016.

BOOK CHAPTERS

Timothy O'Donnell and Alex Rubinsteyn. "High-Throughput MHC I Ligand Prediction Using MHCflurry." *Methods Molecular Biology: Bioinformatics for Cancer Immunotherapy.* Humana, New York, NY. March 2020. https://doi.org/10.1007/978-1-0716-0327-7_8

Sebastian Boegel, John C Castle, Julia Kodysh, **Timothy O'Donnell**, Alex Rubinsteyn. "Bioinformatic methods for cancer neoantigen prediction." *Progress in Molecular Biology and Translational Science.* Academic Press. July 2019. https://doi.org/10.1016/bs.pmbts.2019.06.016

CONTRIBUTED ABSTRACTS

Timothy J. O'Donnell, Meimi Shan, Elliott Merritt, et al. "PhIP-seq assessment of the serum antibody repertoire before and after immune-related adverse events in four melanoma patients treated with checkpoint blockade immunotherapy." Fourth CRI-CIMT-EATI-AACR International Cancer Immunotherapy Conference. doi: 10.1158/2326-6074.CRICIMTEATIAACR18-B032. Sept 2018.

Alex Rubinsteyn and **Tim O'Donnell**. "Predicting expression of neoantigens." International Society for Computational Biology (ISMB). July 2018.

Tim O'Donnell, Alex Rubinsteyn, Michael S. Rooney, Joel Greshock, Jeff Hammerbacher. "Improving MHC I ligandome prediction using mass-spec." CSHL Fundamental Immunology & Its Therapeutic Potential. April 2017.

A. Rubinsteyn, I. Hodes, **T. O'Donnell**, S. F. Mondet, et al. "Computational pipeline for a personalized genomic vaccine trial." Proceedings of the Second CRI-CIMT-EATI-AACR International Cancer Immunotherapy Conference. doi: 10.1158/2326-6066.IMM2016-A022. Sept. 2016.

Alex Rubinsteyn, **Timothy O'Donnell**, Nandita Damaraju, Jeffrey Hammerbacher "Predicting Peptide-MHC Binding Affinities With Imputed Training Data" 2016 ICML Workshop on Computational Biology; doi: 10.1101/054775. June 2016.

Tim O'Donnell, Arun Ahuja, Alexandra Snyder, Jeff Hammerbacher "Probing the increase in neoantigen burden at recurrence in ovarian cancer" 13th Cancer Immunotherapy (CIMT) annual meeting. doi: 10.7490/f1000research.1112114.1. May 2016.

Tim O'Donnell, Alexandra Snyder, B. Arman Aksoy, Jeff Hammerbacher "Does platinum therapy impact somatic mutation burden?" Keystone Symposium on Cancer Immunotherapy. Jan 2016.

Theodore Pak, **Timothy O'Donnell**, Andrew Kasarskis "Automated Identification of Emerging Drug Resistance by Retrospective Mining of Electronic Medical Records" Abstract No. 170. ID Week. Aug 2015.

Arun Ahuja, Ryan Williams, **Tim O'Donnell**, Jeff Hammerbacher "Validating a New Somatic Mutation Caller Using TCGA Data," Abstract No. 18. TCGA Fourth Annual Scientific Symposium, May 2015.

SERVICE

Member of Immune Epitope Database (IEDB) Expert Committee, 2020 – present.

Editorial Board member (Review editor), Cancer Immunity and Immunotherapy section, *Frontiers in Immunology* and *Frontiers in Oncology*, 2021 – present.

Guest reviewer for *Cell Systems*, *Cell Reports, Bioinformatics*, *PLOS Computational Biology, OncoImmunology*, *BMC Immunology, Molecular & Cellular Proteomics, ImmunoInformatics*