OMB No. 0925-0001 and 0925-0002 (Rev. 03/2020 Approved Through 02/28/2023)

BIOGRAPHICAL SKETCH

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NAME: Hanlon, Douglas John

eRA COMMONS USER NAME (credential, e.g., agency login): DHANLON

POSITION TITLE: Research Scientist

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)

| INSTITUTION AND LOCATION | DEGREE(if applicable) | Completion DateMM/YYYY | FIELD OF STUDY |
| --- | --- | --- | --- |
| LeMoyne College, Syracuse, NY | B.S. | 06/1987 | Biology |
| Upstate Medical Center, Syracuse, NY | Ph.D. | 06/1993 | Cell & Molecular Biology |
| Yale University, New Haven, CT  | Postdoctoral | 05/1998 | Dermatology/Immunobiology |

1. **Personal Statement**

The principal focus of our laboratory group has been the development of anti-tumor immunotherapies, through extracorporeal engineering of immunostimulatory dendritic APC vaccines as well as nanotechnology platforms for antigen delivery, targeting and readout of Ag-specific responses. An ongoing two-year collaboration with the Santangelo lab has focused these efforts on lipid nanoparticle (LNP)-based delivery systems, relevant not only to cancer but infectious disease and immune tolerance. We have developed methodologies to rapidly differentiate physiological dendritic cells (phDC) directly from human or murine blood samples in time frames (2 hrs to o/n) previously unattainable in existing cellular therapies. We now seek to expand our immunotherapy focus from targeting tumor-associated neo-Ags antigens to those derived from pandemic-relevant pathogens such as SARS-CoV-2, chronic viral infection agents and tissue Ag for tolerance induction.

1. **Positions and Honors**

**Positions and Employment**

9/87-5/92 SUNY Health Science Center at Syracuse, New York, Graduate Teaching Assistant and Doctoral Candidate, Department of Anatomy and Cell Biology

5/92-5/95 Yale University School of Medicine, New Haven, CT - Postdoctoral Associate, Section of Neuropathology

7/95-7/98 Yale University School of Medicine, New Haven, CT - Postdoctoral Associate, Department of Dermatology/Section of Immunobiology

7/98-5/20 Yale University School of Medicine, New Haven, CT - Associate Research Scientist, Department of Dermatology

5/20-present Yale University School of Medicine, New Haven, CT - Research Scientist, Department of Dermatology

##### **Awards and Honors**

1982-1986 Clifford Furnas Scholar of Biology- full academic scholarship from Clifford Furnas Foundation, Buffalo, NY

1988-1989 Outstanding Research: doctoral candidate - SUNY Health Science Center A.A.R.S.

1996 Department of Dermatology Training Grant - funding for collaborative training in Yale’s Dermatology Department and Howard Hughes Medical Institute’s Section of Immunobiology

1999-2001 Dermatology Foundation Career Development Award

**C. Contributions to Science** (with selected references)

1. Development of clinically-relevant immunotherapies based on “Transimmunization”, a dendritic cell (DC)-based anti-tumor immunotherapy:
2. Alvero AB and Hanlon D, (authors contributed equally), Pitruzzello M, et al. Transimmunization restores immune surveillance and prevents recurrence in a syngeneic mouse model of ovarian cancer. *Oncoimmunology*. 9(1):1758869. (2020)
3. Wei BM, Hanlon D, Khalil D, Han P, Tatsuno K, Sobolev O, Edelson RL. Extracorporeal Photochemotherapy: Mechanistic Insights Driving Recent Advances and Future Directions. Yale J Biol Med. 2020 Mar 27;93(1):145-159. PMID: 32226344; PMCID: PMC7087063.
4. Ventura, A., Vassall, A., Yurter, A., Robinson, E., Filler, R., Hanlon, D., Meeth, K., Ezaldein, H., Girardi, M., Sobolev, O., Bosenberg, M.W., Edelson, R.L. Novel Protocol for Generating Physiologic Immunogenic Dendritic Cells*. J. Vis. Exp*. (147), e59370, doi:10.3791/59370 (2019)
5. Ventura A, Vassall A, Robinson E, Filler R, Hanlon D, Meeth K, Ezaldein H, Girardi M, Sobolev O, Bosenberg MW and Edelson RL. Extracorporeal Photochemotherapy Drives Monocyte-to-Dendritic Cell Maturation to Induce Anticancer Immunity. *Cancer Research* 2018; 78(14):4045-4058
6. Discovery of underlying DC responsible for clinical responses associated with Extracorporeal Phototherapy and development of next-generation immunotherapies and associated T cell readouts utilizing physiologic DC (phDC):
7. Han P and Hanlon D (authors contributed equally), Tatsuno K, Robinson A, Filler R, Sobolev O, Cote, C, Rivera-Molina, F, Toomre D and Fahmy T and Edelson RL (co-contributing authors). Platelet P-selectin initiates cross-presentation and dendritic cell differentiation in blood monocytes. *Science Advances*. Vol. 6, no. 11, eaaz1580. (2020)
8. Nami M, Han P, Hanlon D, Tatsuno K, Wei B, Sobolev O, Pitruzzello M, Vassall A, Yosinski S, Edelson R, Reed M. Rapid Screen for Antiviral T-Cell Immunity with Nanowire Electrochemical Biosensors. Adv Mater. 2022 Jul;34(29):e2109661. doi: 10.1002/adma.202109661. Epub 2022 Mar 25. PMID: 35165959.
9. Hanlon D, Sobolev O, Ventura A, Vassall A, Kibbi N, Han P, Yurter A, Robinson A, Filler R, Tatsuno K and Edelson RL. Rapid Production of Physiologic Dendritic Cells (phDC) for Immunotherapy. “Dendritic Cell Reprogramming”, Springer Methods in Molecular Biology, (2019)
10. Han P, Hanlon D, Sobolev O, Chaudhury R, Edelson RL. Ex vivo dendritic cell generation- A critical comparison of current approaches. Int Rev Cell Mol Biol. 2019;349:251-307. doi: 10.1016/bs.ircmb.2019.10.003. Epub 2019 Nov 15. PMID: 31759433.
11. Understanding the role of immunogenic cell death (ICD) in the treatment of cancer cells to maximize immunotherapeutic vaccine potency:
12. Tatsuno K., Han P., Edelson R., Hanlon D. Detection of Immunogenic Cell Death in Tumor Vaccination Mouse Models. In: Alvero A.B., Mor G.G. (eds) Detection of Cell Death Mechanisms. *Methods in Molecular Biology,* vol 2255, 171-186. (2021)
13. Tatsuno K, Yamazaki T, Hanlon D, Han P, Robinson E, Sobolev O, Yurter A, Rivera-Molina F, Arshad N, Edelson RL and Lorenzo Galluzzi L. Extracorporeal photochemotherapy induces bona fide immunogenic cell death. *Cell Death Dis*.10(8): 578-https://doi.org/10.1038/s41419-019-1819-3. (2019)
14. Use of Nanomaterials as Ag delivery vehicles for “personalized” anti-tumor vaccination:
15. Saluja SS, Hanlon DJ, Sharp FA, Hong E, Khalil D, Robinson E, Tigelaar R, Fahmy TM, Edelson RL. Targeting human dendritic cells via DEC-205 using PLGA nanoparticles leads to enhanced cross-presentation of a melanoma-associated antigen. Int J Nanomedicine. 2014 (12); 9:5231-46
16. Prasad S, Cody V, Saucier-Sawyer JK, Saltzman WM, Sasaki C, Edelson RL, Birchall MA, Hanlon DJ. Polymer nanoparticles containing tumor lysates as antigen delivery vehicles for dendritic cell-based anti-tumor immunotherapy in HNSCC and other solid malignancies. Nanomedicine 7: 1-10 (2011).
17. Prasad S, Cody V, Saucier-Sawyer JK, Fadel TR, Edelson RL, Birchall MA, Hanlon DJ. Optimization of stability, encapsulation, release, and cross-priming of tumor antigen-containing PLGA nanoparticles. Pharm Res. 2012 Sep;29(9):2565-77
18. Solbrig CM, Saucier-Sawyer JK, Cody V, Saltzman WM, Hanlon DJ. Polymer nanoparticles for immunotherapy from encapsulated tumor-associated antigens and whole tumor cells. Mol Pharmaceutics 4: 47–57 (2007).
19. Recognition, in collaboration with the Edelson research group, of Cutaneous T Cell Lymphoma (CTCL) as a distinctive malignancy of skin-homing T cells, whose clinical features reflect the biologic properties of the neoplastic cells. Development of methodologies to culture these cells and utilize them to understand ECP and Transimmunization:
20. Hanlon DJ\*, Berger CL, (authors contributed equally), Kanada D, Dhodapkar, Lombillo V, Wang N, Christensen I, Howe G, Crouche J, El-Fishawy P, and Edelson R. The growth of cutaneous T- cell lymphoma is stimulated by immature dendritic cells. *Blood* 99: 2929-2939 (2002).
21. Berger, CL, Xu A-L, Hanlon D, Lee C, Schechner J, Glusac E, Christensen I, Snyder E, Holloway V, Tigelaar R, Edelson RL. Large-scale induction of human tumor-loaded dendritic cells. *Int. J. Cancer* 91: 438-447 (2001).
22. Berger CL, Longley J, Hanlon DJ, Girardi M, Edelson R. The clonotypic T cell receptor is a source of tumor-associated antigens in cutaneous T cell lymphoma. *Ann NY Acad Sci* 941: 106-123.
23. Berger CL, Hanlon D, Kanada D, Girardi M, Edelson RL. Transimmunization, a novel approach for tumor immunotherapy. *Transfusion & Apheresis Science2002 Jun;* 26(3): 205-216.

Complete List of Published Work in MyBibliography:

<https://www.ncbi.nlm.nih.gov/myncbi/douglas.hanlon.1/bibliography/public/>

**D. Additional Information: Research Support and/or Scholastic Performance**

**Ongoing Research Support**

Sponsored Research Agreement 03/01/2019-02/28/2022

PI Edelson

Transimmune AG

Unrestricted investigation of the role of physiologic dendritic cells in immunity and tolerance.

Current Principal Focus: Elucidation of Platelet Signaling of Monocyte-to-Dendritic Cell Differentiation.

Role: Lab Director

Bill and Melinda Gates Foundation: 07/01/2021-06/30/2022

PIs: Edelson and Hanlon (Yale), Santangelo, (Georgia Tech), Rappaport and Qin (Tulane)

Anti-viral immunization using physiologic dendritic cells

Potentially renewable

Role: Co-PI