

March 2023

Mass Cytometry profiling of the peripheral blood immunome in patients with psoriasis and psoriatic arthritis uncovers potential biomarkers related to disease progression

Meyer Gershater

Wayne State School of Medicine, gi7180@wayne.edu

CongCong Yin

Henry Ford Health System

Tingting Liu

Henry Ford Health System

Yi Yao

Henry Ford Health System

Peter Dimitrion

Wayne State School of Medicine

See next page for additional authors

Follow this and additional works at: https://digitalcommons.wayne.edu/som_srs

 Part of the [Medicine and Health Sciences Commons](#)

Recommended Citation

Gershater, Meyer; Yin, CongCong; Liu, Tingting; Yao, Yi; Dimitrion, Peter; Toor, Jugmohit; Subedi, Kalpana; and Mi, Qing-Sheng, "Mass Cytometry profiling of the peripheral blood immunome in patients with psoriasis and psoriatic arthritis uncovers potential biomarkers related to disease progression" (2023). *Medical Student Research Symposium*. 209.

https://digitalcommons.wayne.edu/som_srs/209

This Research Abstract is brought to you for free and open access by the School of Medicine at DigitalCommons@WayneState. It has been accepted for inclusion in Medical Student Research Symposium by an authorized administrator of DigitalCommons@WayneState.

Authors

Meyer Gershater, CongCong Yin, Tingting Liu, Yi Yao, Peter Dimitrion, Jugmohit Toor, Kalpana Subedi, and Qing-Sheng Mi

Mass Cytometry profiling of the peripheral blood immunome in patients with psoriasis and psoriatic arthritis uncovers potential biomarkers related to disease progression

Congcong Yin MD/PhD^{1,2}, Gershater, Meyer MS^{1,2,3}, Tingting Liu, ^{1,2}, Yi Yao PhD^{1,2}, Peter Dimitrion MS^{1,2,3}, Jugmohit Toor^{1,2}, Kalpana Subedi PhD^{1,2}, Qing-Sheng Mi MD/PhD^{1,2,3,6#}

¹Center for Cutaneous Biology and Immunology Research, Department of Dermatology, Henry Ford Health System, Detroit, MI, 48202, USA.

²Immunology Research Program, Henry Ford Cancer Institute, Henry Ford Health System, Detroit, MI, 48202, USA.

³Cancer Biology Graduate Program, School of Medicine, Wayne State University, Detroit, MI, 48202, USA.

⁶Department of Biochemistry, Microbiology, and Immunology, School of Medicine, Wayne State University, Detroit, MI, 48202, USA.

#Corresponding Author: Dr. Qing-Sheng Mi, Henry Ford Health System, 1 Ford Place, Detroit, MI, USA.

Cutaneous psoriasis (PsC) is an auto-immune disorder affecting 60 million people globally, among 30% of whom progress to psoriatic arthritis (PsA), a disease with poorly understood etiology, making diagnosis and treatment difficult. Indeed, a complete systemic immune profile of PsA has yet to be performed. In the study herein, we collected peripheral blood samples from patients with PsC, PsA with or without systemic therapy, and healthy controls (HC), and utilized mass cytometry by time of flight (CyTOF) to acquire immune cell profiles of major leukocyte subsets. We found that patients with PsC and/or PsA exhibited increased frequencies of intermediate (CD14+CD16+) and nonclassical (CD14-CD16+) monocytes as well as regulatory T cells. Separation of our heterogenous patient population revealed distinct immune profiles according to ethnicity and sex in patient groups. Analysis of homing markers revealed upregulation of CCR4, CCR7, and CXCR3 on Classical Monocytes and/or Naïve CD8+ T cells in PsC and/or PsA patients. Moreover, analysis of functional markers revealed upregulation of CD38, CD28, and CD25 on Tregs and EM CD4+ T cells in PsC and/or PsA patients. Unbiased machine learning algorithms (CITRUS) revealed upregulation of Classical Monocytes in PsC and PsA compared to HC patients. Lastly, CITRUS revealed upregulated Intermediate Monocytes in PsA compared to PsC patients, and upregulated Classical Monocytes in treated PsA compared to untreated PsA patients. Therefore, we provide a comprehensive profile of immune cell population frequencies and phenotypes in patients with PsC and PsA, highlighting Monocytes and Tregs as potential biomarkers for early diagnosis of PsA.