Using the Octave® MSDA Test to Identify Differences in Disease Activity and Panel Biomarkers Between Oral Disease Modifying Therapies: Evaluating MOA-Specific Proteomic Profiles Against Non-DMT Patients with MS

Jennifer Chester, Gargi Datta, Matthew Burrill, Elisa Toy, Shannon McCurdy, David Brazel, Jonathan Verrier, Andrea Osking, Ferhan Qureshi, Terrie Livingston
Octave Bioscience, Inc, Menlo Park, CA, USA

P1353

Introduction

Many disease-modifying therapies (DMT) are available for MS in the United States (US), each with distinct mechanisms of action (MOA). Fluid biomarkers can help personalize treatment, monitoring, and therapy adjustments.[1] The Octave® Multiple Sclerosis Disease Activity (MSDA) test is a clinically validated, blood-based biomarker panel used in clinical practice across the US.[2] [3]

Objectives

To compare MSDA scores (1-10 in 0.5 increments)and biomarkers across three oral DMT classes - fumarates, sphingosine 1-phosphate (S1P) receptor modulators, and teriflunomide - versus no DMT, to assess whether distinct MOAs are associated with divergent proteomic signatures.

		No DMT (875 patients)	Fumarates (140 patients)	S1P (146 patients)	Teriflunomide (141 patients)
Test count		1121	173	190	187
Age at baseline	Mean (sd)	58.8 (13.2)	53.8 (12.0)	52.6 (12.7)	60.5 (11.1)
Sex (%)	Female	694 (79.3%)	108 (77.1%)	115 (78.8%)	110 (78.0%)
	Male	181 (20.7%)	32 (22.9%)	31 (21.2%)	31 (22.0%)
Race[a]	White	618 (82.9%)	91 (75.8%)	95 (80.5%)	99 (77.3%)
	Black	59 (7.9%)	15 (12.5%)	12 (10.2%)	10 (7.8%)
	Other	69 (9.2%)	14 (11.7%)	11 (9.3%)	19 (14.8%)
Ethnicity[b]	Hispanic/Latino	20 (3.0%)	1 (0.9%)	6 (6.0%)	4 (3.6%)
	Not Hispanic/ Latino	649 (97.0%)	111 (99.1%)	94 (94.0%)	106 (96.4%)

Table 1: Patient demographics per drug MOA restricted to patients on drug for >3 months.
[a]Race data not reported No DMT=748; Fumerates=120, S1P=118, Teriflunomide=128
[b]Ethnicity data not reported No DMT=672; Fumerates=112, S1P=100, Teriflunomide=110

Disclosure: Jennifer Chester, Gargi Datta, Elisa Toy, Shannon McCurdy, David Brazel, Jonathan Verrier, Andrea Osking, Ferhan Qureshi, and Terrie Livingston are employees of and hold equity in Octave Bioscience. Matthew Burrill is a consultant for Octave Bioscience.

References: [1] Chitnis T, Magliozzi R, Abdelhak A, Kuhle J, Leppert D, Bielekova B. Blood and CSF biomarkers for multiple sclerosis: emerging clinical applications. Lancet Neurol. 2025;24(12):1066-1078. doi:10.1016/S1474-4422(25)00249-2
[2] Qureshi F, Hu W, Loh L, et al. Analytical validation of a multi-protein, serum-based assay for disease activity assessments in multiple sclerosis. Proteomics Clinical Applications. Feb 2023. https://doi.org/10.1002/prca.202200018.
[3] Chitnis T, Foley J, Ionete C, et al. Clinical Validation of a Multi-protein, Serum-based Assay for Disease Activity Assessments in Multiple Sclerosis. Clinical Immunology. Aug 2023. https://doi.org/10.1016/j.clim.2023.109688.
[4] Okuda DT, Anderson BJ, Taylor SM, et al. Comparative multi-analyte serum protein differences between generic and brand-name dimethyl fumarate, fingolimod, and teriflunomide in multiple sclerosis, *Clinical Immunology,* Volume 288, 2026, 110766, ISSN 1521-6616, https://doi.org/10.1016/j.clim.2026.110766.

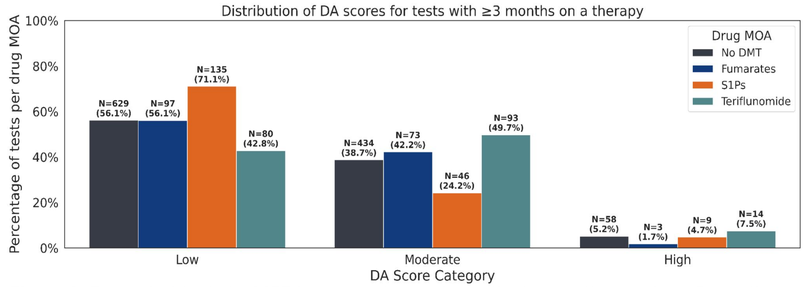


Figure 1: Percent of tests by MSDA score category for patients on a therapy for ≥ 3 months. Low: 1-4; Moderate: 4.5-7; High: 7.5-10

Methods

A retrospective analysis of routine clinical data from the Octave® MSDA Test (through June 2026) characterized MSDA scores across three oral DMT classes; only patients with consecutive tests on the same DMT ≥ 3 months apart were included. Age and sex adjusted ordinary least squares (OLS) models compared MSDA scores and log10 concentrations of the 18 biomarkers between each DMT class and no DMT patients at the last available timepoint for ≥ 3 months between consecutive MSDA tests on the same DMT (or no DMT; excluding patients in multiple classes). Post-hoc contrasts were performed where two or more DMT classes were independently significant. All p-values reported are Bonferroni-corrected.

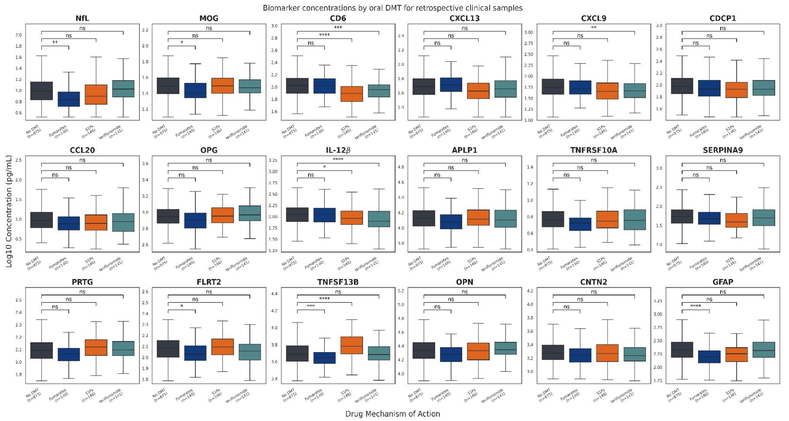


Figure 2: Biomarker distributions for tests from patients on a therapy for ≥ 3 months. N refers to the number of tests per therapy. Statistical significance is from corresponding linear mixed-effects model for each biomarker.
**** p < 0.0001 *** p < 0.001 ** p < 0.01 * p < 0.05 ns: not significant

Results

As of June 2026, 140, 146, 141, and 875 patients (173, 190, 187, and 1,121 tests) were on fumarates, S1Ps, teriflunomide, and no DMT respectively, for ≥3 months. Median MSDA scores were 4, 3.5, 4.5, and 4 (Low: 56%, 71%, 43%, 56%; Moderate: 42%, 24%, 50%, 39%; High: 2%, 5%, 7%, 5%).

At the latest ≥3-month timepoint, S1P adjusted MSDA scores were 0.60 units lower (p<0.001) and teriflunomide 0.42 units higher (p=0.014) than no DMT; fumarates did not differ significantly from no DMT (p=1.00). S1Ps and teriflunomide differed significantly from each other (p<0.001; contrast test). Compared to no DMT, FLRT2, GFAP, MOG, NfL, and TNFSF13B (β=−0.037;−0.079;−0.048;−0.068;−0.063) differed significantly for fumarates; CD6, IL-12β, and TNFSF13B (β=−0.129; −0.075; 0.084) for S1Ps; and CD6, CXCL9, and IL-12β (β=−0.076; −0.096; −0.133) for teriflunomide (Bonferroni-adjusted p<0.05). TNFSF13B differed significantly between fumarates and S1Ps (p<0.001; contrast test).

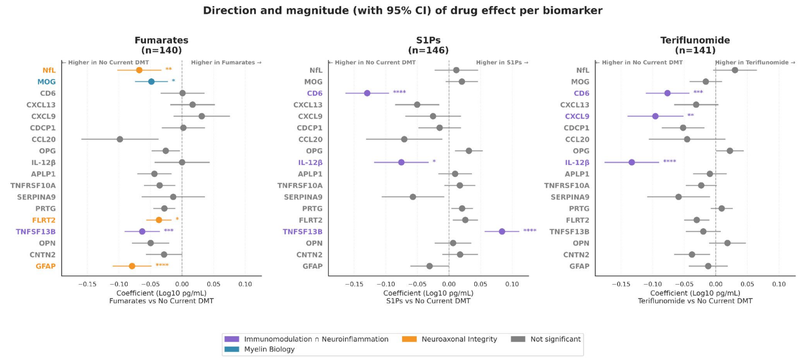


Figure 3: Significant biomarkers by MSDA pathway category.
**** p < 0.0001 *** p < 0.001 ** p < 0.01 * p < 0.05 ns: not significant

Conclusions

MSDA scores and biomarker profiles differed across oral DMT classes, suggesting that MOA-specific proteomic signatures may support more precise therapeutic monitoring in MS. Further differences have been identified between generics and brand name DMTs, not addressed in this analysis.[4] Additional research is required to further validate these findings.

Presented at the 10th Joint ACTRIMS-ECTRIMS meeting (MSToronto), October 21-23, 2026 in Toronto, Canada.