Table SI: List of the 26 baseline predictor variables identified in this study.

	Predictor variable	Outcome	Source
Demographics and baseline characteristics	Sex	Male vs. female	Literature
	Age	Continuous	Literature
	BMI	BMI<30 vs. BMI ≥30	TSDT
	Race	White vs. non-white	Machine-learning and TSDT
	Family history of PsO	No vs. yes	TSDT
	Smoking status	Current vs. other	Literature
Comorbidities	Any comorbidities	No vs. yes	Machine learning and TSDT
	Psoriatic arthritis	No vs. yes	TSDT
	Hypertension	No vs. yes	TSDT
	Diabetes mellitus	No vs. yes	Literature
	Dyslipedmia	No vs. yes	Literature
	HADS-anxiety	≥8 vs. <8	Literature
	HADS-depression	≥8 vs. <8	Literature
Disease characteristics	PASI score	Continuous	Machine learning
	BSA score	Continuous	Literature
	Disease duration	Continuous	Literature
	Genital PsO	No vs. yes	Literature
	Scalp PsO	No vs. yes	Machine learning and TSDT
	Palmoplantar PsO	No vs. yes	Machine learning and TSDT
	Nail PsO	No vs. yes	TSDT
Prior biologic use	Bioexperience	Bio-naïve vs. bioexperienced	Literature
Concomitant medication	Topical agent	No vs. yes	TSDT
	Conventional therapy	No vs. yes	TSDT
Biologic treatment class	IL-17A		
	TNF-α	IL-17A vs. TNF-α	Machine learning
	IL-12/23	IL-17A vs. IL-12/23	Literature
	IL-23	IL-17A vs. IL-23	Machine learning

BMI=body mass index; BSA=body surface area; HADS-A=hospital anxiety and depression scale - anxiety; HADS-D=hospital anxiety and depression scale – depression; IL=interleukin; M=month; PASI=psoriasis area and severity index; PsO=psoriasis; TNF=tumor necrosis factor; TSDT=Treatment-Specific Subgroup Detection Tool.

Table SII: Hyperparameters of the machine learning models.

Models	Hyperparameters
Logistic Model (LR)	No. of Features: 36
LASSO Model (PLR)	Lambda: sequence of 100 lambdas chosen by sparsegl No. of Features: 44 No. CV folds: 5
XGBoost Model	Learning Rate: 0.01 Max Depth: 2:7 Number of rounds: 10000 Early stopping rounds: 200 Min Child Weight: 1, 10, 100 Gamma: 0 Column Subsample Ratio by Tree: 0.5 No. Features: 44 No. CV folds: 5

LASSO: Least Absolute Shrinkage and Selection Operator; XGBoost: Extreme Gradient Boosting

Table SIII: Performance (median with 95% rCI) of PASI 100 response models on validation sets.

	PASI100 at W12									
Model Type	*AUC*	*Precision AUC*	*Accuracy*	*Youden Index*	*F1 Score*	*PPV*	*NPV*	*Sensitivity*	*Specificity*	*MCC*
XGBoost	0.651 (0.604, 0.703)	0.429 (0.375, 0.495)	0.698 (0.680, 0.715)	0.016 (-0.006, 0.106)	0.060 (0.000, 0.265)	0.5 (0, 1)	0.701 (0.696, 0.723)	0.032 (0.000, 0.177)	0.990 (0.916, 1.000)	0.062 (-0.033, 0.189)
Logistic	0.656 (0.609, 0.702)	0.419 (0.370, 0.478)	0.690 (0.656, 0.715)	0.085 (0.023, 0.146)	0.250 (0.155, 0.324)	0.465 (0.349, 0.6)	0.718 (0.703, 0.733)	0.169 (0.097, 0.242)	0.916 (0.864, 0.958)	0.126 (0.037, 0.210)
LASSO (sparsegl)	0.648 (0.602, 0.696)	0.412 (0.363, 0.471)	0.698 (0.673, 0.705)	0.000 (-0.009, 0.069)	0.030 (0.000, 0.210)	0.429 (0, 0.934)	0.698 (0.696, 0.713)	0.016 (0.000, 0.137)	0.993 (0.923, 1.000)	0.000 (-0.035, 0.139)
	PASI100 at m12									
Model Type	*AUC*	*Precision AUC*	*Accuracy*	*Youden Index*	*F1 Score*	*PPV*	*NPV*	*Sensitivity*	*Specificity*	*MCC*
XGBoost	0.592 (0.543, 0.636)	0.564 (0.517, 0.615)	0.566 (0.523, 0.607)	0.132 (0.046, 0.215)	0.566 (0.500, 0.617)	0.555 (0.512, 0.601)	0.576 (0.531, 0.623)	0.575 (0.470, 0.691)	0.559 (0.436, 0.649)	0.132 (0.046, 0.215)
Logistic	0.611 (0.564, 0.656)	0.588 (0.536, 0.642)	0.583 (0.537, 0.626)	0.165 (0.074, 0.252)	0.579 (0.525, 0.627)	0.572 (0.526, 0.615)	0.592 (0.547, 0.639)	0.586 (0.514, 0.657)	0.580 (0.500, 0.649)	0.165 (0.074, 0.252)
LASSO (sparsegl)	0.608 (0.560, 0.653)	0.585 (0.534, 0.637)	0.577 (0.534, 0.621)	0.155 (0.070, 0.241)	0.576 (0.523, 0.621)	0.568 (0.524, 0.618)	0.588 (0.544, 0.631)	0.583 (0.508, 0.657)	0.574 (0.489, 0.654)	0.156 (0.070, 0.241)
	PASI 100 at w12, m6 and m12									
Model Type	*AUC*	*Precision AUC*	*Accuracy*	*Youden Index*	*F1 Score*	*PPV*	*NPV*	*Sensitivity*	*Specificity*	*MCC*
XGBoost	0.636 (0.566, 0.695)	0.240 (0.186, 0.305)	0.838 (0.830, 0.840)	0.000 (-0.006, 0.027)	0.000 (0.000, 0.058)	0.354 (0, 1)	0.838 (0.837, 0.832)	0.000 (0.000, 0.030)	1.000 (0.991, 1.000)	0.000 (-0.031, 0.113)
Logistic	0.637 (0.578, 0.689)	0.231 (0.188, 0.288)	0.838 (0.833, 0.840)	-0.000 (-0.006, 0.015)	0.000 (0.000, 0.030)	0 (0, 1)	0.838 (0.837, 0.840)	0.000 (0.000, 0.015)	1.000 (0.991, 1.000)	0.000 (-0.031, 0.113)
LASSO (sparsegl)	0.639 (0.580, 0.697)	0.233 (0.188, 0.296)	0.838 (0.838, 0.838)	0.000 (0.000, 0.000)	0.000 (0.000, 0.000)	NA (NA, NA)	0.838 (0.838, 0.838)	0.000 (0.000, 0.000)	1.000 (1.000, 1.000)	0.000 (0.000, 0.000)

Higher AUC = Better distinction between comparisons of variables tested; Higher Precision = Better minimization of false positives; Youden Index of >50% or higher F1 score = Better performance of model; Higher specificity= Better identification of negative results. PPV= tp/(tp+fp). Where NA is stated, tp=fp=0 so a valid answer for PPV was not attainable. AUC=Area Under Curve; LASSO= Least Absolute Shrinkage and Selection Operator; MCC= Matthew's correlation coefficient; NPV= Negative Predictive Value; rCI=resample confidence interval; PPV=positive predictive value; sparsegl=Sparse Group Lasso; XGBoost=Extreme Gradient Boosting.