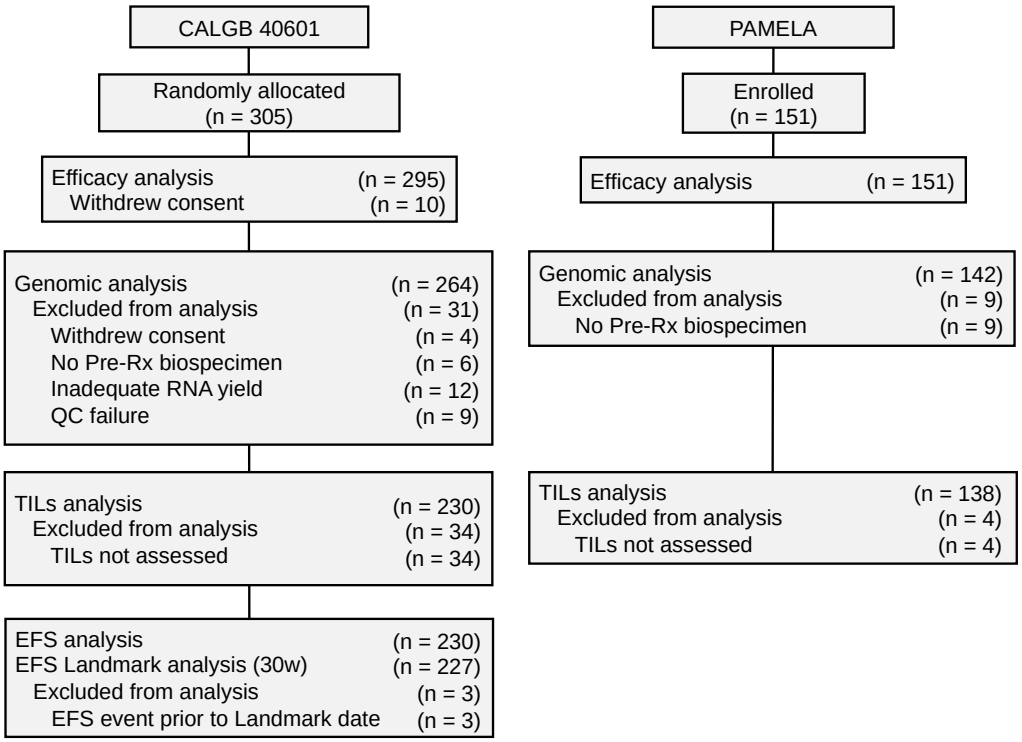
Supplementary Online Content

Fernandez-Martinez A, Pascual T, Singh B, et al. Prognostic and predictive value of immune-related gene expression signatures vs tumor-infiltrating lymphocytes in early-stage ERBB2/HER2-positive breast cancer: a correlative analysis of the CALGB 40601 and PAMELA trials. *JAMA Oncol*. Published online January 5, 2023. doi:10.1001/jamaoncol.2022.6288

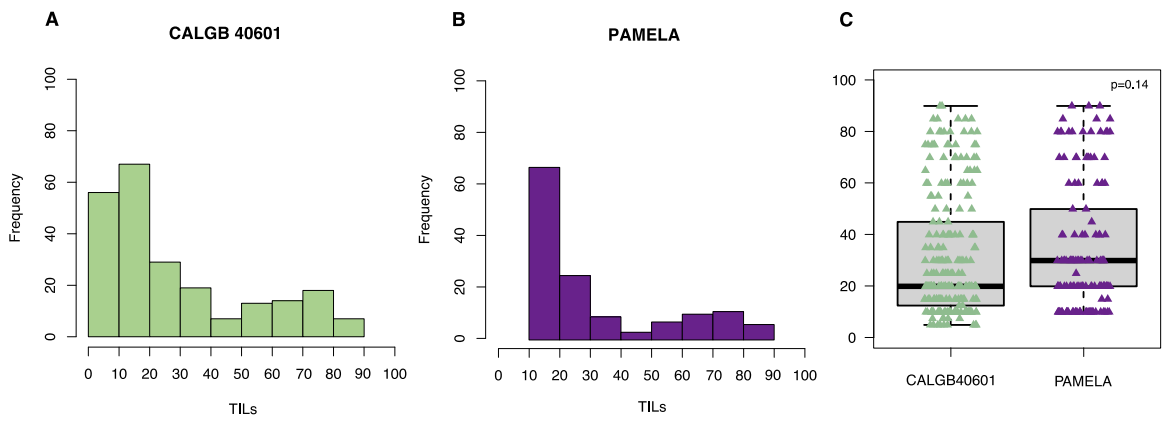
This supplementary material has been provided by the authors to give readers additional information about their work.

eFigure 1. CONSORT Diagram

TILs: Tumor-Infiltrating Lymphocytes; Rx: treatment; QC: quality control; w: weeks.

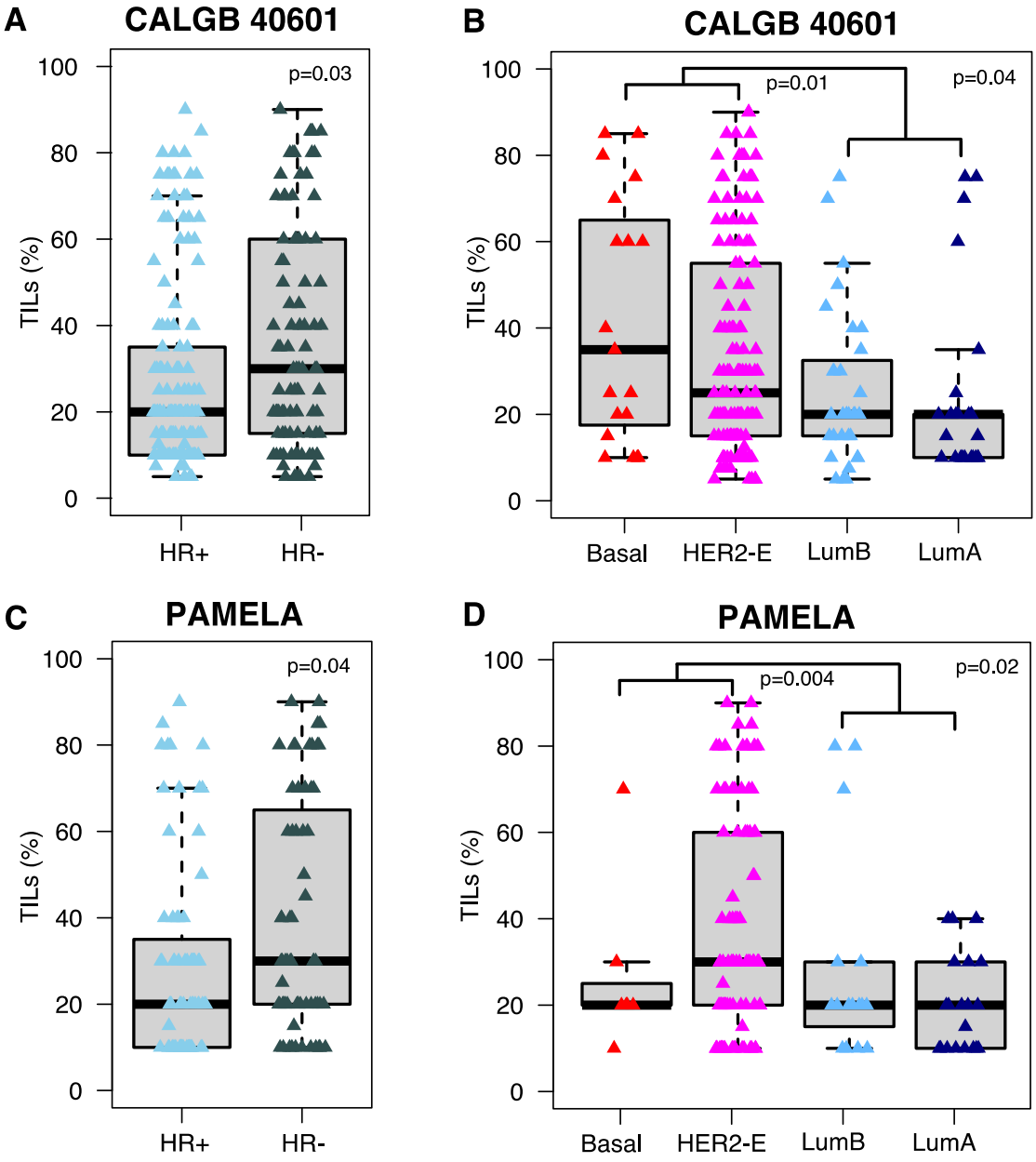


eFigure 2. Distribution of Tumor-Infiltrating Lymphocytes Infiltration by Clinical Trial



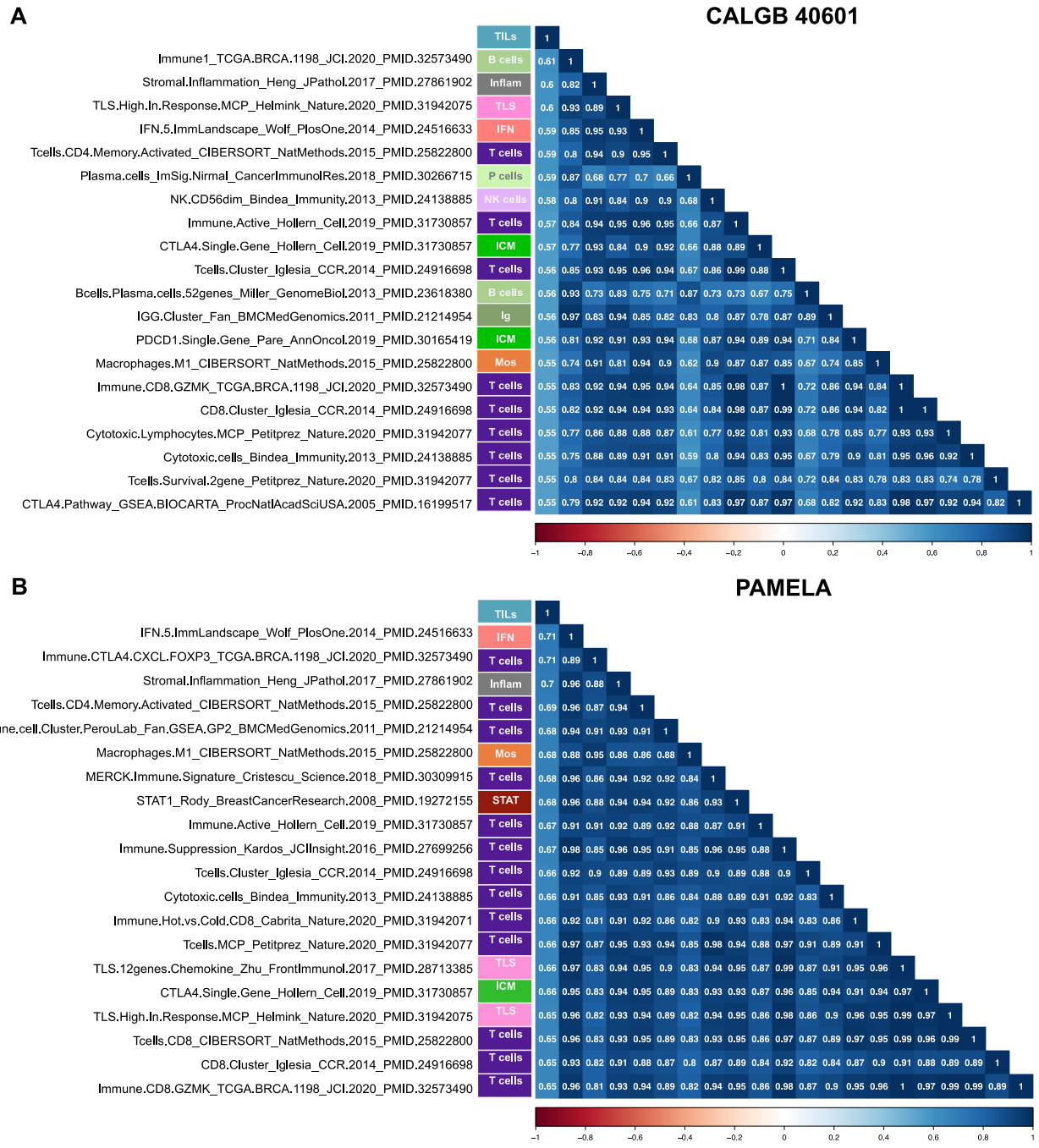
A) Histogram of Tumor-Infiltrating Lymphocytes infiltration levels in CALGB 40601. B) Histogram of Tumor-Infiltrating Lymphocytes infiltration levels in PAMELA. C) Comparison of Tumor-Infiltrating Lymphocytes infiltration levels between both clinical trials. Statistical differences were assessed using an Kruskal Wallis test (P-value at the top of the figure). The horizontal line from the boxplots represents the median of the distribution. TILs: Tumor-Infiltrating Lymphocytes.

eFigure 3. Comparison of Stromal Tumor-Infiltrating Lymphocytes (TILs) Levels by Hormone Receptor Status and Intrinsic Subtype in CALGB 40601 and PAMELA



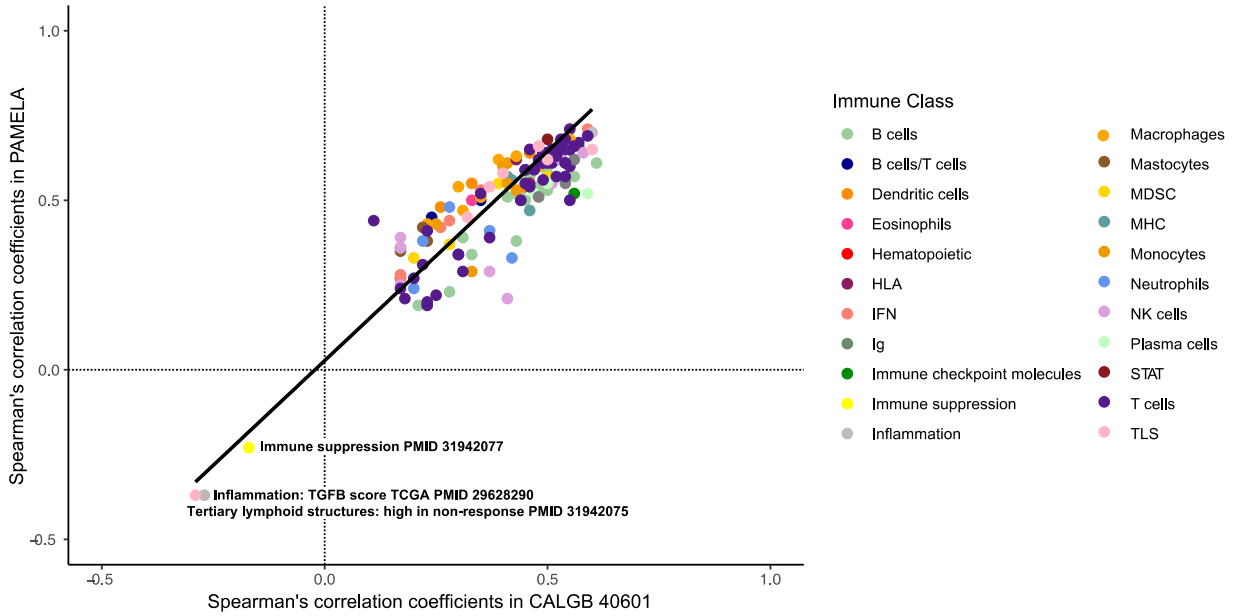
Comparison of stromal Tumor-Infiltrating Lymphocytes (TILs) levels by hormone receptor status and intrinsic subtype in CALGB 40601 (A, B) and PAMELA (C, D) trials. Statistical differences were assessed using an Kruskal Wallis test (P-value at the top of the figure). The horizontal line from the boxplots represents the median of the distribution.
TILs: Tumor-Infiltrating Lymphocytes; HR+: hormone receptor positive; HR-: hormone receptor negative; Basal: basal-like; HER2-E: HER2-Enriched; LumB: luminal B; LumA: luminal A.

eFigure 4. Correlation Between Tumor-Infiltrating Lymphocytes (TILs) Levels and Immune Gene Expression Signatures (iGES)



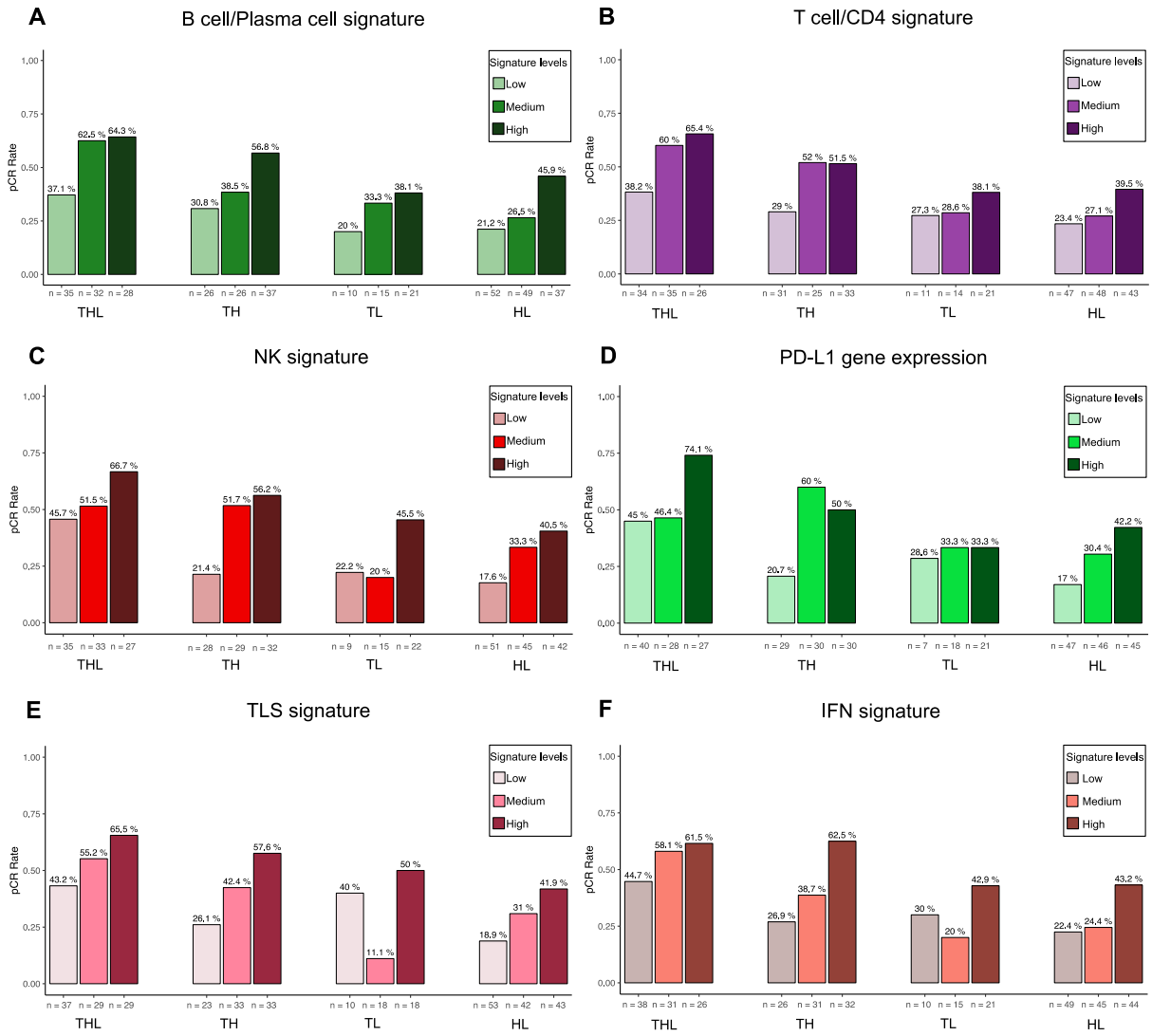
Spearman's Correlations between Tumor-Infiltrating Lymphocytes (TILs) levels and immune gene expression signatures. The 20 signatures with a p-value of 0.05 and the highest correlation coefficients are shown for A) CALGB 40601 and B) PAMELA.
TILs: Tumor-Infiltrating Lymphocytes; Inflam: inflammation; TLS: tertiary lymphoid structures; IFN: interferon; P: plasma; ICM: immune checkpoint molecules; Mos: macrophages; NK: natural killer; Ig: immunoglobulin; STAT: signal transducer and activator of transcription.

eFigure 5. Association Between the Spearman Correlation Coefficients of Tumor-Infiltrating Lymphocytes (TILs) and Immune Gene Expression Signatures (iGES) in CALGB 40601 and PAMELA.



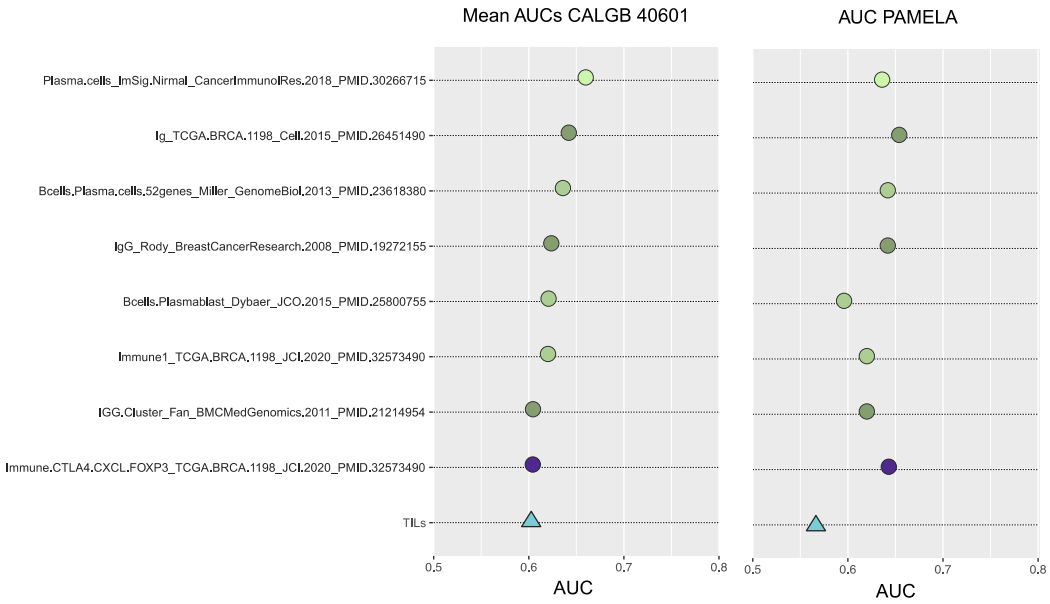
Only the signatures significantly correlated with TILs in both studies (166/202, 81.2%) are represented (adjusted p-value < 0.05).
HLA: human leukocyte antigens; IFN: interferon; Ig: Immunoglobulin; MDSC: myeloid-derived-suppressor cells; MHC: major histocompatibility complex; NK: natural killer; STAT: signal transducer and activator of transcription; TLS: tertiary lymphoid structures.

eFigure 6. Rates of Pathologic Complete Response (pCR) According to Immune Gene Expression Signature (iGES) Levels



iGES have been divided by tertiles to illustrate their association with pCR rates.
pCR: pathologic complete response; T: weekly paclitaxel; H: trastuzumab; L: lapatinib; NK: natural killer; PD-L1: programmed death-1 ligand 1; TLS: tertiary lymphoid structures; IFN: interferon.

eFigure 7. Accuracy Metrics of the Univariable Immune Biomarker Models for Pathologic Complete Response (pCR) Prediction



Using CALGB 40601 as training set, the average AUC of the different models was calculated across all the resamples using 10-fold cross validation. A second AUC for the different biomarkers was calculated using PAMELA as an external validation set. The gene expression signatures are represented as circles compared to TILs as continuous variable, that is represented as a triangle. The circle colors represent the immune signature class as shown in eTable 1.
TILs: Tumor-Infiltrating Lymphocytes; AUC: Area under the receiver operating characteristic curve.

eTable 1. List of Immune Gene Expression Signatures, Signature Class, PMID, and Genes Within a Signature

Signature ID paper	Immune class	Signature class	PMID	Genes
Bcells.Cluster Iglesia CCR.2014 PMID.24916698	**B cells**	Signature	PMID.24916698	3512; 9834; 608; 83416; 5450; 973; 96610; 8755; 389643; 150365; 974; 5079; 2208; 79368; 643; 930; 84824; 640; 115350; 931; 1269; 55024; 23495
Bcells.IL10.Minus Lin JImmunol.2014 PMID.25080484	**B cells**	Signature	PMID.25080484	6504; 3586; 3569; 4049; 374; 50832; 1259; 5167; 2745; 54512; 92935; 6723; 760; 6507; 55176; 1960; 3280; 3662; 9021; 10406; 79005; 10794; 6503; 51559; 11147; 55784; 92002
Bcells.IL10.Plus Lin JImmunol.2014 PMID.25080484	**B cells**	Signature	PMID.25080484	225; 481; 822; 901; 946; 1491; 1545; 1831; 2149; 2170; 2213; 2316; 2838; 3087; 3512; 3552; 3587; 3597; 3663; 3687; 3695; 3782; 3937; 3956; 4000; 4046; 4063; 4233; 4938; 4940; 5027; 5996; 6346; 6505; 6843; 9235; 9447; 9760; 10150; 10225; 10550; 10628; 10752; 10800; 11343; 22797; 23208; 25842; 26207; 26230; 28984; 51284; 51676; 55785; 55809; 55824; 57379; 79026; 81553; 84561; 118429; 128553; 130367; 143686; 151963; 162394; 166824; 167838; 201799; 219285; 219855; 257144; 285386; 374618; 388325; 402415
Bcells.Centroblast Dybaer JCO.2015 PMID.25800755	**B cells**	Signature	PMID.25800755	10810; 7482; 148229; 651; 23710; 4086; 54443; 259266; 55635; 7153; 100126791; 283431; 9928; 10112; 80119; 1062; 25959; 8739; 4297; 157740; 101928620; 81930; 79071; 5450; 23089; 1063; 9787; 27109; 4751; 9582; 10733; 4798; 5577; 124989; 983; 100506844; 23766

Bcells.Centrocyte Dybaer JCO.2015 PMID.25800755	**B cells**	Signature	PMID.25800755	55448; 8622; 101929450; 639; 54820; 116931; 94121; 327657; 64805; 597; 6662; 88; 3117; 55971; 4023; 9638; 92737; 1960; 25953; 3119; 84102; 285313; 63971; 10170; 55785; 816; 285237; 5795; 1289; 53354; 23334; 54072; 55293; 147945; 3690; 100506930; 27197; 148808; 114614; 9782; 2956; 9133; 100509457; 406947; 724102
Bcells.Memory Dybaer JCO.2015 PMID.25800755	**B cells**	Signature	PMID.25800755	6352; 170371; 946; 1230; 100506071; 3684; 27197; 374618; 1285; 1690; 440823; 27163; 2857; 2212; 79026; 195; 83417; 339005; 10382; 285972; 8082; 3310; 440253
Bcells.Naive Dybaer JCO.2015 PMID.25800755	**B cells**	Signature	PMID.25800755	55211; 10252; 4345; 351; 8496; 5243; 167410; 140733; 643733; 100128252; 8531; 8115; 342926; 909; 5796; 9976; 646113; 4606; 1901; 6328; 2650; 401312; 646588; 63934; 2208
Bcells.Memory CIBERSORT NatMethods.2015 PMID.25822800	**B cells**	Signature	PMID.25822800	10863; 60468; 55024; 640; 4064; 930; 911; 933; 951; 969; 971; 973; 974; 1380; 643; 9214; 2213; 79368; 2444; 2841; 91316; 3087; 3112; 3495; 3507; 3514; 91353; 3394; 80183; 4050; 9450; 931; 4829; 5026; 5368; 5790; 55103; 10235; 150094; 6557; 6689; 26228; 29802; 9447; 240; 1235; 939; 9629; 160518; 9750; 2788; 3446; 3574; 4153; 440348; 27240; 11262; 80008; 23495; 608; 9618; 27033
Bcells.Naive CIBERSORT NatMethods.2015 PMID.25822800	**B cells**	Signature	PMID.25822800	5244; 10863; 60468; 55024; 605; 79656; 640; 673; 4064; 930; 911; 933; 951; 969; 971; 973; 974; 1380; 643; 55840; 9214; 2208; 2213; 79368; 2444; 2841; 91316; 3087; 3112; 3495; 3507; 3514; 91353; 3566; 3394; 80183; 283876; 4050; 9450; 4224; 57553; 931; 55335; 4829;

				5026; 9934; 5368; 5670; 5790; 55103; 10235; 6402; 150094; 6557; 6689; 26228; 8115; 54576; 29802; 57335
Bcells Garber CellMolGastroenterol Hepatol.2017 PMID.28508029	**B cells**	Signature	PMID.28508029	10863; 240; 60468; 55024; 53335; 53335; 53335; 53335; 640; 643; 930; 933; 951; 951; 958; 971; 973; 2208; 2788; 3087; 3112; 3117; 114884; 5368; 25780; 6689; 8115; 29802; 9934; 55103; 55103; 55103; 6039; 6328; 608
Bcells.Extended Garber CellMolGastroenterol Hepatol.2017 PMID.28508029	**B cells**	Signature	PMID.28508029	3899; 65069; 10409; 695; 66033; 201895; 934; 100133941; 972; 972; 973; 26047; 51523; 378885; 9214; 84824; 23062; 3119; 3126; 23231; 4067; 4082; 55846; 256236; 5336; 5777; 10509; 51092; 6643
Bcells Bindea Immunity.2013 PMID.24138885	**B cells**	Signature	PMID.24138885	608; 640; 930; 931; 971; 1380; 1690; 1838; 2731; 2788; 3112; 3117; 3493; 3500; 3507; 3514; 3535; 4208; 5244; 5368; 6328; 6565; 6689; 8115; 9834; 10803; 29064; 29760; 53335; 55278; 57553; 60468; 79368; 114884
Bcells.ImmuneProfiles.Mouse.Human Shay PNAS.2013 PMID.23382184	**B cells**	Signature	PMID.23382184	19; 330; 489; 605; 640; 643; 695; 930; 931; 933; 951; 958; 971; 972; 973; 974; 1185; 1235; 1380; 1387; 1456; 1657; 1960; 2181; 2185; 2208; 2841; 2872; 2889; 3280; 3399; 3592; 3662; 3708; 3915; 4033; 4064; 4208; 4209; 4214; 4641; 5079; 5106; 5142; 5287; 5290; 5336; 5451; 5452; 5530; 5579; 5777; 5925; 5966; 5993; 6480; 6565; 6598; 6643; 6689; 6721; 6850; 6925; 6929; 6949; 7187; 7430; 7799; 7942; 8202; 8527; 8564; 8930; 8942; 9015; 9026; 9135; 9308; 9450; 9451; 9467; 9640; 9657; 9665; 9681; 9711; 9734; 9779; 9788; 9873; 9896; 9922; 10193; 10447; 10564; 11108; 11142; 22837; 22876; 22898;

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Bcells.Activated Charoentong CellRep.2017 PMID.28052254	**B cells**	Signature	PMID.28052254	79368; 3507; 931; 10863; 80709; 9938; 60468; 640; 6366; 4064; 930; 939; 952; 974; 388512; 283420; 160365; 1380; 2788; 3112; 3514; 57553; 5368; 6689; 8115; 608
Bcells.Immature Charoentong CellRep.2017 PMID.28052254	**B cells**	Signature	PMID.28052254	115350; 26228; 933; 1536; 199786; 115352; 83416; 84824; 9734; 3117; 84329; 9711; 653361; 654816; 27334; 6672; 117289; 10628; 54877
Bcells.Memory Charoentong CellRep.2017 PMID.28052254	**B cells**	Signature	PMID.28052254	4609; 57379; 890; 1033; 1184; 5167; 2205; 83417; 860; 6653; 6660; 6776; 6777; 54106
Bcells ImSig.Nirmal CancerImmunolRes. 2018 PMID.30266715	**B cells**	Signature	PMID.30266715	283663; 100507616; 29802; 640; 79368; 8115; 5079; 115350; 4063; 971; 83416; 115352; 8698; 5452; 931; 79856; 933; 199786; 3112; 81793; 1380; 26228; 3899; 4064; 5026; 151888; 951; 1235; 930; 28387; 5368; 1879; 974; 84824; 55024; 973
Bcells.Plasma.cells.52genes Miller GenomeBiol.2013 PMID.23618380	**B cells**	Signature	PMID.23618380	973; 26586; 9917; 3662; 54900; 4917; 5450; 608; 3512; 91316; 100423062; 723778; 3500; 28461;

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Bcells.Tcells.Cooperation Hollern Cell.2019 PMID.31730857	**B cells/T cells**	Signature	PMID.31730857	115350; 640; 3502; 3502; 28776; 3500; 3502; 3514; 3512; 973; 100423062; 100423062; 3495; 930; 931; 5079; 3581; 6363; 51617; 2864; 959; 28558; 28621; 387923; 388507
Immune.14 Perez JCO.2015 PMID.2560586	**B cells/T cells**	Signature	PMID.25605861	84632; 120425; 6366; 1233; 913; 959; 6387; 2534; 3112; 3487; 3394; 5729; 5734; 81793
Tcells.Bcells.Lymphocyte.Infiltration Calabro BreastCancerResTreat.2009 PMID.18592372	**B cells/T cells**	Signature	PMID.18592372	6352; 930; 951; 915; 916; 917; 919; 973; 974; 925; 926; 3502; 3512; 3537; 929; 3932; 4050; 931
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Dendritic.cells.Immature. Charoentong CellRep.2017 PMID.28052254	**Dendritic cells**	Signature	PMID.28052254	400; 22876; 353514; 34; 10768; 8854; 224; 223; 246; 271; 275; 471; 498; 128346; 829; 1212; 1441; 5328; 23682; 5962; 58528; 6571; 4070

Dendritic.cells.Immature. Bindea Immunity.2013 PMID.24138885	**Dendritic cells**	Signature	PMID.24138885	645; 909; 910; 911; 913; 1436; 1497; 2162; 2167; 2535; 2952; 2978; 4070; 4321; 5468; 5550; 5909; 8566; 9023; 9429; 9956; 10462; 22846; 23428; 51760; 53343; 64170; 64231; 65010; 81501; 81562
Plasmacytoid.Dendritic.cell Charoentong CellRep.2017 PMID.28052254	**Dendritic cells**	Signature	PMID.28052254	80325; 23466; 146722; 1601; 10521; 2014; 2022; 2204; 11337; 2876; 25994; 3419; 3479; 3563; 3674; 9903; 25984; 9500; 4925; 8481; 8473; 9601; 57661; 60675; 5899; 84666; 50862; 6397; 51734; 9792; 140885; 10959
Eosinophils CIBERSORT NatMethods.2015 PMID.25822800	**Eosinophils**	Signature	PMID.25822800	8809; 671; 932; 6003; 1178; 9173; 9934; 719; 10402; 246; 4688; 53829; 23569; 6036; 51744; 8807; 8972; 26030; 5996; 55024; 597; 27202; 1602; 23604; 9681; 64174; 2015; 30817; 84658; 22905; 2867; 2696; 1880; 8477; 222487; 3568; 4033; 4117; 4084; 27334; 5029; 5146; 27039; 9185; 23223; 64092; 55512; 27293; 79865; 140803; 7673
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Eosinophils Charoentong CellRep.2017 PMID.28052254	**Eosinophils**	Signature	PMID.28052254	1602; 23604; 9681; 84658; 2354; 2696; 1880; 8477; 3568; 442236; 4033; 8013; 9934; 5146; 27039; 23223; 10402
Hematopoietic.Stem.cells.ImmuneProfiles.Mouse.Human Shay PNAS.2013 PMID.23382184	**Hematopoietic**	Signature	PMID.23382184	34; 284; 328; 332; 402; 444; 501; 594; 667; 672; 701; 759; 760; 783; 835; 947; 983; 1017; 1019; 1021; 1063; 1111; 1163; 1312; 1503; 1523; 1602; 1635; 1718; 1793; 1854; 1869; 1876; 1892; 1954; 1964; 2078; 2099; 2119; 2120; 2135; 2237; 2288;

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Immune.HLA.A.F TCGA.BRCA.1198 JCI.2020 PMID.32573490	**HLA**	Signature	PMID.32573490	3133; 116071; 3659; 81030; 3902; 3107; 3105; 3106; 3134; 5698; 5696; 6890; 3965; 3601; 197259
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IFN Rody BreastCancerResearch.2008 PMID.19272155	**IFN**	Signature	PMID.19272155	91543; 4940; 10561; 9636; 55601; 10964; 2537; 4599; 3437; 3429; 3434; 4938; 4939
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IFN.3.ImmLandscape Wolf PlosOne.2014 PMID.24516633	**IFN**	Signature	PMID.24516633	3627; 23586; 55601; 51191; 55008; 3429; 10561; 10964; 2537; 64135; 3434; 3433; 3437; 9636; 4599; 4938; 4939; 4940; 8638; 91543; 64108; 54809; 6772; 6890
IFN.5.ImmLandscape Wolf PlosOne.2014 PMID.24516633	**IFN**	Signature	PMID.24516633	27299; 9447; 597; 330; 10384; 6357; 6362; 6363; 6352; 6355; 1236; 930; 952; 917; 969; 973; 942; 926; 64581; 56253; 1075;

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IFN.Pathway ImSig.Nirmal CancerImmunolRes. 2018 PMID.30266715	**IFN**	Signature	PMID.30266715	57169; 85441; 10964; 57674; 85363; 11274; 9636; 55601; 94240; 4599; 4600; 116071; 684; 151636; 55008; 51191; 10561; 3428; 84875; 51056; 6614; 64761; 54625; 115361; 2633; 64135; 64108; 8519; 4940; 5371; 91543; 4939; 3431; 219285; 3430; 84941; 129607; 6890; 51246; 26270; 54739; 79132; 9246; 51131; 6772; 10346; 6737; 6773; 55337; 5698; 23586; 10379; 3437; 3433; 8638; 3434; 8542; 27074; 83666; 24138; 3665; 54809; 10906; 80830; 441108; 2537
IFN.Score.module3 TCGA Immunity.2018 PMID.29628290	**IFN**	Signature	PMID.29628290	10561; 10964; 23586; 2537; 3429; 3433; 3434; 3437; 8375; 8374; 8376; 3627; 4599; 4938; 4939; 4940; 51191; 54809; 55008; 55601; 64108; 64135; 6772; 6890; 8638; 91543; 9636
Immune.IFN TCGA.BRCA.1198 JCI.2020 PMID.32573490	**IFN**	Signature	PMID.32573490	10379; 24138; 51191; 55008; 55601; 54809; 3429; 2537; 9636; 23586; 64135; 3434; 10561; 10964; 3433; 3437; 129607; 91543; 4939; 4599; 8638; 4938; 4940; 54625; 83666; 6772; 11274; 54739; 4600; 64761; 5359; 9246; 6672; 3431

IgG Rody BreastCancerResearch.2008 PMID.19272155	**Ig**	Signature	PMID.19272155	391427; 96610; 339562; 28902; 651961; 90925; 651629; 91353; 28299; 28461; 5450; 28831; 91316; 3538; 28793; 3514; 28815; 3500; 3507; 28786; 3495; 3493; 3535; 3492; 3537; 652745
IGG.Cluster Fan BMCMedGenomics.2011 PMID.21214954	**Ig**	Signature	PMID.21214954	939; 3561; 973; 11040; 5450; 3514; 28793; 3535; 3512; 608; 4917; 3576; 3107; 54900
Ig TCGA.BRCA.1198 Cell.2015 PMID.26451490	**Ig**	Signature	PMID.26451490	28904; 28467; 28875; 28426; 28776; 28474; 28919; 28424; 28923; 28874; 28420; 28784; 28423; 28817; 28937; 28457; 28876; 28943; 28778; 28400; 28396; 28793; 28434; 28391; 28941; 28938; 28935; 28408; 28394; 28797; 28914; 28395; 28465; 28809; 28450; 28822; 28448; 28933; 28468; 28388; 28813; 28921; 28444; 28815; 28893; 28392; 28299; 28442; 28912; 28908; 28913; 28825; 28439; 28796
Immune.Suppression Kardos JCIInsight.2016 PMID.27699256	**Immune checkpoint molecules**	Signature	PMID.27699256	29126; 3620; 356; 1493; 5133; 3902; 84868; 80380; 3586; 7040; 5743; 4513
CD274.Single.Gene Hollern Cell.2019 PMID.31730857	**Immune checkpoint molecules**	Gene	PMID.31730857	29126; 29126; 29126; 29126
CTLA4.Single.Gene Hollern Cell.2019 PMID.31730857	**Immune checkpoint molecules**	Gene	PMID.31730857	1493; 1493; 1493; 1493
PDCD1.Single.Gene Pare AnnOncol.2019 PMID.30165419	**Immune checkpoint molecules**	Gene	PMID.30165419	5133; 5133; 5133; 5133
Immunosuppression Petitprez Nature.2020 PMID.31942077	**Immune suppression**	Signature	PMID.31942077	7043; 6387; 7040; 3956
Stromal.Inflammation Heng JPathol.2017 PMID.27861902	**Inflammation**	Signature	PMID.27861902	1493; 27436; 50943; 2633; 9812; 11040; 23231; 9047; 56833; 201633; 79413
Wound.Healing Chang PlosBiol.2004 PMID.14737219	**Inflammation**	Signature	PMID.14737219	292; 1111; 1178; 1326; 1633; 1663; 1841; 1978; 1981; 2023; 2107; 2171; 2193; 2224; 2923; 3015; 3037; 3146; 3151; 3157;

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TGFB.score TCGA Immunity.2018 PMID.29628290	**Inflammation**	Signature	PMID.29628290	4314; 65108; 3482; 3912; 6678; 2335; 3676; 6608; 4327; 3696; 3678; 4811; 7076; 6405; 23433; 1499; 4313; 5054; 2048; 1307; 1969; 3371; 3728; 3675; 6934; 1281; 1004; 7482; 8754; 1832; 3339; 392; 3693; 3488; 396; 4035; 3485; 1495; 10234; 4323; 4756; 1946; 3690; 2049; 960; 3487; 7132; 5879; 5829; 5327; 1295; 7479;

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Immune.FOS.JUN.IL6 TCGA.BRCA.1198 JCI.2020 PMID.32573490	**Inflammation**	Signature	PMID.32573490	8013; 3569; 9021; 467; 1959; 64651; 1843; 1958; 2354; 7538; 3164; 3725; 1839; 23645
Macrophages.M0 CIBERSORT NatMethods.2015 PMID.25822800	**Macrophages**	Signature	PMID.25822800	366; 728; 968; 51313; 3101; 10261; 4688; 51296; 8876; 8740; 54; 27299; 79365; 79839; 6362; 6367; 6354; 1116; 1296; 1435; 2921; 6374; 1593; 81501; 2239; 8685; 4318; 7941; 5473; 25797; 56833; 84561; 54209
Macrophages.M1 CIBERSORT NatMethods.2015 PMID.25822800	**Macrophages**	Signature	PMID.25822800	366; 51296; 27299; 1116; 200315; 11026; 10288; 64127; 51284; 51311; 6352; 80830; 8651; 3902; 3559; 5739; 10563; 79931; 1236; 952; 43; 80833; 408; 6363; 6355; 958; 1193; 3627; 6373; 4283; 1594; 79132; 10148; 2687; 8820; 3620; 10964; 643314; 8942; 27074; 51365; 83937; 91543; 6614; 6504; 11182; 7130; 54795
Macrophages.M2 CIBERSORT NatMethods.2015 PMID.25822800	**Macrophages**	Signature	PMID.25822800	51296; 27299; 1116; 51311; 6355; 1193; 10148; 2687; 6614; 968; 51313; 6362; 54209; 199; 5199; 50856; 2242; 2535; 64231; 53829; 51314; 920; 246; 6357; 6358; 6368; 30835; 10462; 1414; 55691; 2952; 3269; 3357; 80896; 80380; 5973; 81029
Macrophages Bindea Immunity.2013 PMID.24138885	**Macrophages**	Signature	PMID.24138885	348; 586; 950; 968; 1116; 1118; 1296; 1536; 2012; 2230; 2239; 2335; 2760; 3730; 4199; 4481; 5730; 6354; 6374; 6447; 6819; 8685; 8832; 9332; 10533; 23601; 26064; 26577; 51338; 58511; 81035; 259230; 1513
Macrophages.M2 Ghassabeh Blood.2006 PMID.16556895	**Macrophages**	Signature	PMID.16556895	383; 84666; 7941; 5660; 6414; 54209; 5376; 10462; 1118; 27159; 374868; 999; 2350

Macrophages.Th1.Cluster Iglesia CCR.2014 PMID.24916698	**Macrophages**	Signature	PMID.24916698	26191; 5330; 50856; 3111; 752; 117289; 5552; 1436; 945; 713; 714; 712; 1520; 146722; 3394; 388325; 4332; 313; 57705; 8832; 22797; 1536; 5294; 11309; 3113; 3115; 3122; 3109; 3108; 972; 64092; 219972; 7133; 9938; 257106; 84433; 64231; 64098; 8477; 80231; 3594; 286336; 221472; 6404; 951; 3059; 7454; 4689; 3689; 83706; 6688; 4542; 27128; 79626; 199; 7940; 124460; 695; 3937; 5788; 2124; 3071; 963; 5341; 920; 54440; 3587; 1794; 2533; 10320; 1234; 6693; 64333; 10859; 11006; 2207; 9056; 3903; 84868; 7805; 942; 23533; 139716; 64926; 147138; 89857; 54518; 6503; 3635; 126364; 27180; 27036; 968; 3687; 55803; 719; 2123; 7456; 10875; 10261; 10288; 51411; 89790; 51311; 6039
Macrophages.ImmuneProfiles.Mouse.Human Shay PNAS.2013 PMID.23382184	**Macrophages**	Signature	PMID.23382184	136; 526; 719; 1026; 1051; 1317; 1436; 1462; 1508; 1827; 1848; 1861; 2131; 4035; 5271; 5326; 6051; 6237; 6256; 6614; 7045; 7056; 7133; 7941; 8522; 8754; 9056; 9732; 9777; 9935; 10577; 10855; 10924; 22918; 26509; 51311; 55022; 55160; 55486; 64127; 206358; 219654
Macrophages Charoentong CellRep.2017 PMID.28052254	**Macrophages**	Signature	PMID.28052254	1268; 1269; 3101; 3269; 2206; 199; 10409; 6346; 6358; 6368; 10344; 124599; 920; 1414; 10209; 1973; 51313; 2242; 2357; 2358; 23401; 55691; 2535; 2850; 27202; 3176; 10261; 80896; 6036; 51296; 51314; 8876; 81029
Macrophages.Monocytes.CSF1.Response Beck CCR.2009 PMID.19188147	**Macrophages**	Signature	PMID.19188147	113; 241; 272; 341; 348; 55843; 409; 567; 695; 80183; 79630; 719; 834; 6347; 6352; 9034; 9332; 945; 962; 1043; 963; 8832; 942; 925; 976; 51816;

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Macrophages ImSig.Nirmal CancerImmunolRes. 2018 PMID.30266715	**Macrophages**	Signature	PMID.30266715	59342; 140; 4481; 51393; 6688; 51311; 55281; 9034; 313; 4125; 2215; 79895; 58475; 3903; 728; 23643; 1240; 597; 51816; 1520; 9332; 712; 10261; 713; 942; 10673; 409; 11006; 4332; 7941; 1508; 11326; 7127; 29887; 719; 1230; 27128; 10437; 3689; 2359; 64747; 79630; 972; 3684; 968; 7133; 1890; 7805; 3687; 2209; 3101; 2210; 80301; 2207; 3128; 920; 717; 1318; 10457; 7305; 10062; 1436; 51338; 3988; 6916; 80896; 3071; 4542; 56833; 11309; 1536; 11314; 64581; 1806; 2212; 51296; 27299
Immune.GIMAP.IL16 TCGA.BRCA.1198 JCI.2020 PMID.32573490	**Macrophages**	Signature	PMID.32573490	54518; 55843; 1439; 9938; 170371; 1193; 2313; 55303; 168537; 474344; 55340; 4242; 139716; 7133; 4033; 10875; 219972; 3635; 3603
Mast.cells.Activated CIBERSORT NatMethods.2015 PMID.25822800	**Mastocytes**	Signature	PMID.25822800	945; 2205; 84561; 8809; 671; 932; 6003; 79895; 1178; 1215; 1359; 1511; 3067; 27306; 2206; 4602; 50508; 4914; 5023; 5553; 5874; 29091; 7177; 6364; 6346; 2921; 3002; 1437; 6351; 3562; 3198; 3552;

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Mast.cells.Resting CIBERSORT NatMethods.2015 PMID.25822800	**Mastocytes**	Signature	PMID.25822800	945; 2205; 84561; 8809; 2672; 671; 1088; 932; 6489; 6003; 26228; 9934; 9508; 154; 79895; 55589; 719; 1178; 1215; 1359; 10321; 1511; 79843; 400451; 3067; 27306; 4056; 2206; 4602; 50508; 4914; 5023; 54852; 5553; 5874; 23176; 29091; 7177
Mast.cells Bindea Immunity.2013 PMID.24138885	**Mastocytes**	Signature	PMID.24138885	116; 190; 794; 946; 1088; 1215; 1359; 1511; 1991; 2206; 2624; 3067; 3248; 3815; 4013; 4353; 5553; 5742; 6571; 6886; 7177; 7857; 10257; 27306; 57419; 57460; 64499; 79083; 339524; 4129
Mast.cell Charoentong CellRep.2017 PMID.28052254	**Mastocytes**	Signature	PMID.28052254	1359; 9508; 55843; 1215; 1368; 1511; 1960; 2219; 2512; 3310; 3680; 29992; 5743; 6037; 6275; 27181; 6532
MDSC.Granulocytic Youn LeukocBiol.2012 PMID.21954284	**MDSC**	Signature	PMID.21954284	100; 9133; 820; 8698; 2298; 2330; 2354; 2812; 3512; 3929; 4048; 4057; 4155; 4353; 5004; 5657; 641371; 55143; 8434; 1687; 55; 1992; 51449; 11065; 27333; 29942; 57509; 3039; 140460; 932; 55796; 55789; 353189; 10420; 9055; 25903
MDSC.Neutrophil Youn LeukocBiol.2012 PMID.21954284	**MDSC**	Signature	PMID.21954284	894; 1154; 1234; 2919; 2921; 3383; 3557; 3569; 3627; 4023; 4323; 4502; 4794; 5196; 5900; 6275; 6281; 6354; 6385; 6648; 6696; 7057; 7124; 7185; 9641; 23328; 23657; 55686; 56895
MDSC.Tumor.Macrophages Schlecker JImmunol.2012 PMID.23152559	**MDSC**	Signature	PMID.23152559	6351; 6348; 6354; 338442; 5008; 10409; 6369; 383; 967; 1339; 9034; 6696; 10022; 7070; 4323; 5996; 3303; 29923; 3553; 339210; 2920; 4360; 4322; 2919; 467; 3932; 1026; 9047; 2012; 929; 28984; 1601; 10912; 6385; 4283; 23179; 29126; 4643; 1263; 58191; 8877; 1958; 713; 8870; 1154; 101; 7124; 4818; 730249; 3123; 3725;

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MDSC.Tumor Schlecker JImmunol.2012 PMID.23152559	**MDSC**	Signature	PMID.23152559	123; 290; 383; 467; 712; 713; 714; 817; 839; 929; 958; 1026; 1154; 1234; 1462; 1476; 1522; 1601; 1643; 1827; 1845; 1846; 1893; 1910; 1958; 2012; 2078; 2155; 2159; 2213; 2309; 2549; 2697; 2799; 2810; 2919; 2920; 3119; 3123; 3162; 3303; 3304; 3383; 3557; 3617; 3680; 3725; 4000; 4239; 4261; 4283; 4322; 4323; 4360; 4794; 5008; 5025; 5026; 5146; 5209; 5236; 5328; 5553; 5597; 5641; 5817; 5866; 5973; 5996; 6347; 6348; 6351; 6354; 6369; 6385; 6535; 6643; 6692; 6696; 7052; 7076; 7124; 7167; 7185; 7431; 7982; 8360; 8364; 8553; 8808; 8835; 8877; 8892; 8991; 9034; 9043; 9046; 9308; 9518; 9522; 9546; 9641; 9732; 9788; 9797; 9934; 9953; 10046; 10062; 10268; 10312; 10417; 10457; 10461; 10493; 10630; 10915; 11172; 11186; 11238; 11282; 11316; 11346; 22862; 23049; 23099; 23166; 23179; 23207; 23216;

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MDSC Charoentong CellRep.2017 PMID.28052254	**MDSC**	Signature	PMID.28052254	929; 5660; 729230; 914; 942; 7852; 2212; 2213; 2214; 83706; 63940; 10068; 3566; 3683; 3684; 64098; 5732; 80142; 6279; 6280
MHC.11genes Forero CancerImmunolRes. 2016 PMID.26980599	**MHC**	Signature	PMID.26980599	4261; 972; 3113; 3115; 3116; 3117; 3123; 3127; 3128; 1512; 8648; 100290966; 731247
MHC.24genes Forero CancerImmunolRes. 2016 PMID.26980599	**MHC**	Signature	PMID.26980599	4261; 972; 3113; 3115; 3116; 3117; 3123; 3127; 3128; 1512; 8648; 100290966; 731247; 913; 2217; 3861; 57121; 89846; 6844; 120892; 4154; 4916; 84265; 5730; 6451; 9760; 399472
MHC.I Rody BreastCancerResearch.2008 PMID.19272155	**MHC**	Signature	PMID.19272155	3135; 3105; 3106; 3107; 3134
MHC.II Rody BreastCancerResearch.2008 PMID.19272155	**MHC**	Signature	PMID.19272155	1520; 972; 3123; 3117; 3109; 3113; 3115; 3108; 3122; 3937; 5552; 5788

MHC.I.CoreGenes Lauss NatCommun.2017 PMID29170503	**MHC**	Signature	PMID.29170503	3105; 3106; 3107; 6891; 84166; 6890; 5698; 5696; 567
CD68.Cluster Iglesia CCR.2014 PMID.24916698	**Monocytes**	Signature	PMID.24916698	126364; 27180; 27036; 968; 3687; 55803; 719
Monocytes CIBERSORT NatMethods.2015 PMID.25822800	**Monocytes**	Signature	PMID.25822800	8875; 2354; 199; 200315; 366; 432; 433; 683; 728; 729230; 912; 945; 968; 978; 5199; 51363; 50856; 64581; 9586; 1441; 51313; 2219; 2242; 2357; 2535; 3055; 3101; 3176; 10855; 10261; 11027; 11026; 10288; 7940; 4210; 4332; 64231; 4688; 4778; 114548; 64127; 53829; 23569; 6036; 6039; 6283; 51296; 7097; 51284; 51311; 7380; 8876
Tcells.Effector.Memory Bindea Immunity.2013 PMID.24138885	**Monocytes**	Signature	PMID.24138885	1231; 2130; 2313; 4058; 4210; 4776; 5616; 6904; 6955; 7430; 9779; 10000; 10521; 27099; 81544
Monocytes.Dendritic.cell.Metagene Miller GenomeBiol.2013 PMID.23618380	**Monocytes**	Signature	PMID.23618380	3113; 7940; 3133; 3115; 3119; 3108; 3122; 3123; 972
Monocytes Charoentong CellRep.2017 PMID.28052254	**Monocytes**	Signature	PMID.28052254	1072; 4155; 71; 308; 432; 433; 526; 912; 5199; 1486; 9802; 326342; 3097; 10320; 65108; 4324; 10908; 10084; 51368; 7009; 7380
Monocytes ImSig.Nirmal CancerImmunolRes. 2018 PMID.30266715	**Monocytes**	Signature	PMID.30266715	7940; 2268; 199; 7077; 2242; 9056; 22918; 1200; 3162; 2219; 7045; 23313; 79168; 29108; 5265; 391; 29992; 5660; 3055; 150372; 84034; 126364; 57085; 2799; 4853; 10288; 11025; 2896; 945; 84106; 84898; 1509; 146722; 1462; 9473; 64115; 929
Monocytes.Dendritic.25genes Miller GenomeBiol.2013 PMID.23618380	**Monocytes**	Signature	PMID.23618380	241; 920; 972; 1436; 1536; 1794; 2123; 2124; 10875; 3109; 3113; 3115; 3117; 3119; 3122; 3123; 3133; 7462; 7940; 5788; 5552; 3118; 3127; 3128; 3108
CSF1.Response TCGA Immunity.2018 PMID.29628290	**Monocytes**	Signature	PMID.29628290	11151; 4332; 9034; 9056; 3108; 2533; 6039; 7097; 1075; 11006; 9595; 1520; 83937; 4478; 1536; 7805;

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Immune.CD34.TIE1 TCGA.BRCA.1198 JCI.2020 PMID.32573490	**Monocytes**	Signature	PMID.32573490	54810; 6403; 5243; 9452; 22915; 6358; 857; 6886; 79843; 22918; 2078; 947; 1003; 80177; 1901; 7075; 10252; 128553; 5168
HCK Rody BreastCancerResearch.2008 PMID.19272155	**Monocytes**	Signature	PMID.19272155	64231; 11309; 51338; 7940; 199; 7305; 1794; 2207; 6039; 9056; 4332; 4688; 713; 7805; 10437; 22797; 9332; 3903; 942; 3689; 3055; 712; 1230
Influenza.11genes Khatri Immunity.2015 PMID.26682989	**Monocytes**	Signature	PMID.26682989	952; 51191; 55008; 2537; 64135; 3959; 4061; 4599; 64761; 64108; 81030
Neutrophils.Activated.Blood Janiszewska NatCellBiol.2019 PMID.31263265	**Neutrophils**	Signature	PMID.31263265	3043; 1514; 3039; 2791; 3043; 10398; 2815; 11313; 27013; 928; 51635; 10482; 3655; 5473; 1191; 8294; 10170; 64805; 65213; 4201; 6840; 11182; 3555; 7850; 653361; 5196; 3181; 84419; 6503; 3040; 4601; 820; 4792; 4282; 1831; 4001; 65125; 51274; 1611; 9246; 11345; 89875; 3187; 51499; 976; 4940; 259230; 26469; 23521; 54625; 54926; 51206; 4713; 6467; 7979; 128346; 10924; 6271; 3480; 5269; 1475;

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Neutrophils.Activated.Lung Janiszewska NatCellBiol.2019 PMID.31263265	**Neutrophils**	Signature	PMID.31263265	467; 8832; 79145; 143384; 115817; 3265; 80153; 92241; 123; 6222; 84919; 9698; 10905; 334; 23741; 2778; 51324; 23048; 10999; 63935; 1479; 11052; 22898; 54542; 7884; 258010; 23360; 63931; 64961; 23412; 5711; 58476; 26292; 4520; 9686; 1613; 7704; 85439; 26156; 9748; 56688; 5439; 9169; 6856; 10011; 6414; 64965; 79095; 151188; 10010; 5782; 4938; 3656; 55180; 60626; 388272; 4597; 64943; 4200; 8260; 139716; 84265; 8295; 255967; 119504; 22862; 5771; 9658; 23602; 57175; 79077; 6137; 10923; 1175; 54522; 91373; 10906; 2631; 79705; 55331; 9274; 203328; 4671; 51527; 4677; 8199; 84557; 3692; 10451; 11021; 51028; 51021; 64959; 2314; 4214; 4089; 51315; 3397; 53938; 3028; 1435; 79982; 6497; 389203; 55144; 155185; 79042; 4205; 5428; 1431; 5376; 140735; 22890; 51586; 7936; 79143; 1656; 29896; 196264; 54407;

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Neutrophils CIBERSORT NatMethods.2015 PMID.25822800	**Neutrophils**	Signature	PMID.25822800	1178; 9934; 4688; 53829; 23569; 8807; 8972; 26030; 64174; 30817; 84658; 2867; 222487; 4117; 4084; 9185; 79865; 7130; 199; 10261; 1116; 51311; 5199; 366; 200315; 10288; 728; 8876; 25797; 8875; 978; 51363; 9586; 1441; 2357; 11027; 7940; 4210; 4332; 4778; 6283; 7097; 820; 79908; 838; 1232; 1084; 3577; 3579; 55924; 2215; 2358; 3034; 3310; 64386; 8993; 79689; 8794; 54210; 55350
Neutrophils Bindea Immunity.2013 PMID.24138885	**Neutrophils**	Signature	PMID.24138885	249; 683; 1084; 1441; 2204; 2215; 2357; 2358; 3577; 3579; 3772; 4051; 4311; 5142; 6283; 6583; 8291; 8347; 8778; 8794; 8972; 9586; 9895; 10288; 10855; 22918; 50486; 51312; 55313; 55350; 83716
Granulocytes.ImmuneProfiles.Mouse.Human Shay PNAS.2013 PMID.23382184	**Neutrophils**	Signature	PMID.23382184	306; 366; 383; 526; 706; 719; 728; 820; 928; 929; 1116; 1436; 1441; 1675; 2896; 3082; 3162; 3176; 3934; 4057; 4814; 4973; 5154; 5329; 5724; 6280; 6403; 6688; 6813; 6916; 7057; 7077; 7097; 7099; 7130; 8301; 8972; 9764; 9826; 10159; 10170; 10457; 10562; 10634; 11237; 23569; 23601; 26253; 50486; 51257; 51311; 51734; 54210; 55350; 55625; 55647; 55793; 56729; 79689; 83716
Neutrophils.MCP Petitprez	**Neutrophils**	Signature	PMID.31942077	762; 1084; 3577; 3579; 4051; 2215; 3034; 3772;

Nature.2020 PMID.31942077				1955; 51312; 79689; 9895; 7090; 8794; 55350
Neutrophils Charoentong CellRep.2017 PMID.28052254	**Neutrophils**	Signature	PMID.28052254	4117; 64386; 200315; 79908; 55924; 838; 978; 51363; 9586; 3577; 3579; 2867; 3034; 8972; 6283; 79689; 8794; 55350
Neutrophils ImSig.Nirmal CancerImmunolRes. 2018 PMID.30266715	**Neutrophils**	Signature	PMID.30266715	10135; 23258; 10154; 6279; 366; 10581; 57580; 6280; 85464; 6777; 2357; 7097; 84984; 3579; 7099; 3759; 23765; 9750; 7132; 399844; 2180; 8291; 11027; 201799; 126308; 5899; 1441; 604; 284996; 1912; 8837; 144423; 80216; 3985; 4689; 11240; 10409; 6774; 7056; 9103; 8972; 51317; 51312; 692205
NK.Activated CIBERSORT NatMethods.2015 PMID.25822800	**NK cells**	Signature	PMID.25822800	919; 3932; 4068; 3004; 3560; 3820; 79037; 3002; 6352; 3001; 8530; 10578; 2999; 3824; 22914; 5551; 5729; 28526; 51744; 8807; 7535; 10225; 924; 5790; 4818; 3595; 1521; 3823; 51348; 8809; 3802; 3812; 10004; 79899; 53637; 30009; 7294; 29909; 2841; 1803; 4050; 4049; 969; 1437; 3458; 9402; 5732; 259197; 60489; 80830; 6351; 894; 1021; 356; 3805; 3809; 5008; 8651; 8740
NK.Resting CIBERSORT NatMethods.2015 PMID.25822800	**NK cells**	Signature	PMID.25822800	914; 919; 3932; 4068; 3004; 28639; 3560; 3820; 79037; 3002; 6352; 3001; 3003; 8530; 10578; 2999; 3824; 22914; 5551; 5729; 28526; 11126; 51744; 2672; 8807; 7535; 10225; 924; 5790; 4818; 3595; 1521; 3823; 8302; 51348; 566; 671; 820; 92211; 1088; 1669; 1991; 8809; 3802; 3812; 8972; 932; 10004; 51314; 79156; 79899; 53637; 30009; 7011; 55020; 7294; 7694
NK.CD56bright Bindea Immunity.2013 PMID.24138885	**NK cells**	Signature	PMID.24138885	758; 1846; 2302; 6236; 6375; 8398; 8567; 10299; 57876; 83696; 254531

NK.CD56dim Bindea Immunity.2013 PMID.24138885	**NK cells**	Signature	PMID.24138885	2975; 3002; 3804; 3806; 3807; 3810; 3811; 3812; 3813; 10417; 50615; 53637; 55020; 56937; 115653
NK Bindea Immunity.2013 PMID.24138885	**NK cells**	Signature	PMID.24138885	104; 219; 323; 596; 988; 2527; 2574; 2778; 3488; 5710; 6375; 6693; 6846; 6915; 7755; 8572; 8817; 8888; 9437; 9902; 11155; 22924; 25959; 27308; 51343; 55503; 55671; 57716; 64129; 64225; 64924; 65988; 79867; 84436; 259230; 643313; 730096
Tcells.Central.Memory Bindea Immunity.2013 PMID.24138885	**NK cells**	Signature	PMID.24138885	360; 472; 841; 1540; 1678; 2533; 3187; 4214; 4297; 4747; 4775; 5108; 6482; 6638; 7294; 8287; 8556; 8675; 8821; 9057; 9397; 11278; 22990; 23059; 23177; 23348; 55729; 58487; 80012; 80342; 85021; 202134; 246721; 283970; 441155; 116828; 27086; 55269; 84663
NK.ImmuneProfiles. Mouse.Human Shay PNAS.2013 PMID.23382184	**NK cells**	Signature	PMID.23382184	598; 864; 1521; 2151; 3001; 3140; 3458; 3560; 3673; 3824; 3982; 4818; 5782; 6574; 7008; 8459; 8530; 8807; 8809; 9437; 11030; 11092; 11126; 11145; 11178; 11285; 30009; 54438; 54843; 79158; 81563; 83988; 254531
NK.CD56bright Charoentong CellRep.2017 PMID.28052254	**NK cells**	Signature	PMID.28052254	1001; 10866; 3067; 18; 64919; 56935; 56951; 92211; 1193; 9167; 148327; 1435; 1459; 1475; 1476; 1503; 1509; 1594; 25853; 8655; 10480; 84173; 957; 151194; 165186; 10468; 2624; 2766; 7107; 84717; 23462; 3198; 9653; 9957; 3892; 64223; 140465; 79612
NK.CD56dim Charoentong CellRep.2017 PMID.28052254	**NK cells**	Signature	PMID.28052254	2902; 3806; 100132285; 3810; 22977; 1593; 57696; 8445; 55890; 3133; 50615; 4854; 64840; 5704; 6168; 7378
NK Charoentong CellRep.2017 PMID.28052254	**NK cells**	Signature	PMID.28052254	729447; 2635; 7940; 10000; 558; 596; 684; 988; 1000; 56253; 1438; 1522;

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NK.Tcell Charoentong CellRep.2017 PMID.28052254	**NK cells**	Signature	PMID.28052254	3802; 3809; 3812; 6696; 10385; 55704; 9398; 135228; 51267; 10695; 245812; 1385; 200186; 64784; 1437; 2015; 8061; 2526; 3308; 126393; 3384; 9235; 145501; 3698; 23081; 3804; 3811; 84623; 3821; 10219; 3920; 10990; 4277; 9437; 84901; 10630; 6386; 9056; 7056; 54209; 85480; 53347; 7412; 51087
NK ImSig.Nirmal CancerImmunolRes. 2018 PMID.30266715	**NK cells**	Signature	PMID.30266715	8302; 5551; 3822; 3823; 57292; 3810; 30009; 100132285; 3806; 3808; 154075; 115653; 3802; 3804; 117157; 3824; 3803; 3811; 3812; 3805
NK.MCP Helmink Nature.2020 PMID.31942077	**NK cells**	Signature	PMID.31942077	11126; 3802; 3804; 3805; 3811; 3813; 9437; 5729; 117157
Bcells.Plasmablast Dybaer JCO.2015 PMID.25800755	**Plasma cells**	Signature	PMID.25800755	639; 857; 999; 1534; 2081; 2487; 2549; 3493; 3537; 3655; 3662; 4121; 4189; 4695; 7421; 7494; 8339; 8343; 8344; 8346; 8347; 8349; 8970; 9236; 10788; 10802; 10970; 22862; 22936; 23446; 23710; 23766; 28396; 28831; 51237; 51303; 54502; 54855; 55132; 57823; 64764; 64778; 79694; 91319; 115908; 144535; 151556; 160428; 317649; 340542; 645784; 100533483; 101928615
Plasma.cells CIBERSORT NatMethods.2015 PMID.25822800	**Plasma cells**	Signature	PMID.25822800	973; 79368; 91316; 3112; 3495; 3507; 3514; 91353; 5026; 5368; 150094; 939; 160518; 2788; 80008; 608; 55840; 23457; 270; 51378; 6315; 79703; 2826; 952; 2848; 3012; 8339; 3497; 3738; 26251; 54923; 100130100; 4121; 79694; 22983; 374977; 51237; 5081; 5163; 25780; 5972; 6003; 642741; 6676;

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Bcells.Plasma.cells. Metagene Miller GenomeBiol.2013 PMID.23618380	**Plasma cells**	Signature	PMID.23618380	3537; 3500; 3507; 3493; 3492; 3514; 28831; 50802; 28823; 100293211; 5450; 608; 91316; 3495; 91353; 100423062
Plasma.cells ImSig.Nirmal CancerImmunolRes. 2018 PMID.30266715	**Plasma cells**	Signature	PMID.30266715	3492; 3502; 28823; 91353; 81567; 91316; 51237; 28902; 608; 28831; 3546; 3514; 3537
STAT1 Rody BreastCancerResearch.2008 PMID.19272155	**STAT**	Signature	PMID.19272155	6890; 2633; 64135; 5698; 4283; 3659; 6373; 3627; 3620; 6772
Proliferation.Pathway ImSig.Nirmal CancerImmunolRes. 2018 PMID.30266715	**T cells**	Signature	PMID.30266715	6491; 2146; 79733; 7272; 6790; 9212; 9232; 55388; 113115; 81620; 9134; 11004; 55143; 83879; 11339; 55215; 157313; 55789; 7153; 113130; 890; 259266; 83461; 9928; 983; 990; 3832; 51514; 56992; 22974; 51203; 84057; 55635; 55872; 4171; 11065; 1894; 4173; 5888; 4175; 29128; 4085; 6241; 11130; 554282; 6240; 701; 3925; 9833; 79801; 1163; 24137; 3149; 4751; 2305; 9768; 54443; 55165; 3161; 7083; 57405; 7298; 5427; 64151; 54892; 55355; 1058; 699; 26271; 220134; 55055; 10721; 9319; 9837; 51659; 91687; 10635; 4288; 51053; 9787; 83540; 146909; 1063; 991; 10403; 332; 1062; 29980; 1033; 29127; 10592; 891; 10733; 9133; 55010; 5111; 6941; 10112
Immune.CTLA4.CXCL.FOXP3 TCGA.BRCA.1198 JCI.2020 PMID.32573490.	**T cells**	Signature	PMID.32573490	1493; 6373; 3627; 4283; 3604; 50615; 56833; 50943; 3620; 94240; 2633
CD8.Cluster Iglesia CCR.2014 PMID.24916698	**T cells**	Signature	PMID.24916698	256380; 151888; 925; 3003; 29909; 128611; 5790; 374403; 10663; 4063; 9744; 27240; 201633; 3932; 55423; 919; 84174; 3702; 10225; 4068; 921; 916; 914; 915; 2833; 114836; 3561; 53347; 6504; 149628; 939; 50852;

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Tcells.CD8.MCP Petitprez Nature.2020 PMID.31942077	**T cells**	Signature	PMID.31942077	926; 926; 926; 926
Tcells.CD4.Memory. Activated CIBERSORT NatMethods.2015 PMID.25822800	**T cells**	Signature	PMID.25822800	914; 919; 915; 917; 924; 1803; 29851; 3932; 4068; 28755; 50852; 53347; 959; 923; 29909; 4818; 940; 1493; 3002; 3902; 6364; 993; 1437; 10563; 2842; 3458; 3595; 3605; 55801; 3559; 3562; 3565; 3578; 4049; 4998; 5367; 9136; 220134; 7293; 79931
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Tcells.CD4.Naive CIBERSORT NatMethods.2015 PMID.25822800	**T cells**	Signature	PMID.25822800	939; 54923; 642741; 9214; 4050; 64919; 914; 919; 915; 917; 924; 1803; 1823; 2323; 9402; 3004; 29851; 3575; 3702; 3932; 51176; 4063; 11184; 79884; 4068; 55423; 6932; 28755; 50852; 28671; 28639; 53347; 7535; 10235; 9744; 79722; 80162; 1236; 959; 55086; 2041; 79667; 79690; 2587; 2825; 27040; 5871; 26297; 50853; 7476; 7754; 25799
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Tcells.Follicular.Helper CIBERSORT NatMethods.2015 PMID.25822800	**T cells**	Signature	PMID.25822800	914; 919; 915; 917; 924; 29851; 3932; 4068; 28755; 50852; 53347; 959; 1493; 3902; 10563; 2842; 4049; 7293; 939; 642741; 9214; 64919; 3004; 3702; 51176; 55423; 6932; 28671; 28639; 7535; 969; 5790; 3820; 1606; 6489; 28680; 28677; 11184; 79884; 80162; 27040; 79037; 150094; 643; 767; 1117; 2354; 7976; 3382; 59067; 23178; 5133; 5996; 56301; 28951; 7253; 65986
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Tcells.Regulatory.Tregs CIBERSORT NatMethods.2015 PMID.25822800	**T cells**	Signature	PMID.25822800	914; 919; 915; 917; 29851; 3932; 4068; 28755; 50852; 53347; 1493; 2842; 939; 64919; 3004; 3702; 55423; 28639; 7535; 1606; 28677; 11184; 1803; 923; 29909; 940; 3559; 5367; 4050; 916; 10225; 920; 11123; 2825; 4153; 27240; 8538; 921; 970; 752014; 29121; 1946; 50943; 83786; 3090; 203510; 3560; 55243; 3904; 23547; 126987; 4861; 4917; 56143; 9651;

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Cytolytic.Activity Rooney Cell.2015 PMID.25594174	**T cells**	Signature	PMID.25594174	3001; 5551
Cytotoxic.Lymphocytes.MCP Petitprez Nature.2020 PMID.31942077	**T cells**	Signature	PMID.31942077	925; 8320; 83888; 10578; 3823; 8302; 3824
Immune.Active Hollern Cell.2019 PMID.31730857	**T cells**	Signature	PMID.31730857	12; 356; 433; 640; 718; 914; 915; 916; 917; 920; 923; 924; 925; 927; 930; 931; 933; 939; 940; 959; 969; 972; 973; 1233; 1380; 1493; 1776; 2634; 2841; 2864; 3002; 3109; 3111; 3112; 3117; 3120; 3135; 3274; 3363; 3458; 3495; 3500; 3502; 3512; 3514; 3559; 3560; 3581; 3593; 3595; 3627; 3682; 3702; 3816; 3820; 3824; 4049; 4050; 4261; 4283; 4332; 4818; 5079; 5133; 5551; 5790; 6039; 6346; 6352; 6363; 6367; 6373; 6434; 6504; 6518; 6773; 6846; 6909; 8302; 8530; 8740; 8798; 8942; 9402; 9476; 9934; 10019; 10100; 10225; 10420; 10563; 10612; 10663; 10666; 10803; 22806; 22914; 26191; 26279; 27334; 28557; 28558; 28621; 28683; 28776; 29126; 29851; 29909; 51617; 53347; 54929; 56253; 56949; 57823; 64386; 80380; 84327; 84636; 114132; 114770; 114836; 115350; 115362; 117157; 137970; 152789; 158067; 163351; 168537; 202309; 221150; 221830; 246778; 283420; 284486; 345611; 353345; 387914; 387923; 388507; 388646; 400410; 445347; 100423062; 100527949; 84824
CTLA4.Pathway GSEA.BIOCARTA ProcNatlAcadSciUSA.2005 PMID.16199517	**T cells**	Signature	PMID.16199517	5781; 941; 942; 940; 915; 916; 917; 3702; 5290; 23308; 6957; 6955; 2885; 919; 29851; 5295; 3932; 3123; 3122; 1493; 3558

Immune.cell.Cluster. PerouLab Fan.GSEA.GP2 BMCMedGenomics.2 011 PMID.21214954	**T cells**	Signature	PMID.16 199517	7453; 3620; 6039; 8477; 4332; 27074; 25816; 4067; 7128; 51316; 3575; 1439; 3659; 7133; 27299; 56833; 55423; 4050; 5790; 1236; 9806; 5341; 972; 3108; 3122; 3109; 2207; 7305; 7805; 3689; 712; 6772; 6373; 3627; 2633; 6890; 5698; 55303; 5552; 10875; 3059; 9938; 3932; 2124; 55843; 9595; 3001; 3937; 963; 3587; 962; 6352; 915; 914; 3003; 5788; 4283; 9535; 3394; 1520; 22797; 6503; 9056; 7940; 199; 942; 3071; 9473; 4069; 1043; 6402; 3134; 3106; 3133; 3002; 10507; 11118; 10384; 834
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PD1.Signaling.React ome GSEA ProcNatlAcadSciUS A.2005 PMID.16199517	**T cells**	Signature	PMID.16 199517	1445; 29126; 3113; 3115; 3117; 3118; 3123; 3125; 3127; 3932; 5133; 5777; 80380; 915; 916; 917; 919; 920
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Cytotoxic.cells Bindea Immunity.2013 PMID.24138885	**T cells**	Signature	PMID.24138885	321; 864; 1521; 1844; 2999; 3001; 3820; 3824; 4818; 6095; 7704; 10578; 22914; 51348; 59307; 80833; 339005
Tcells Bindea Immunity.2013 PMID.24138885	**T cells**	Signature	PMID.24138885	914; 915; 916; 917; 923; 940; 3932; 4068; 5588; 6955; 8631; 9452; 10225; 28639; 28755; 50852; 55340; 64919; 83988
Tcells.Thelper Bindea Immunity.2013 PMID.24138885	**T cells**	Signature	PMID.24138885	940; 987; 1386; 4676; 5527; 6117; 6955; 7332; 8604; 9452; 9632; 10538; 10541; 10730; 10772; 23015; 25842; 29851; 55274; 57122; 63901; 79009; 79866; 285527
Tcells.Follicular.Helper Bindea Immunity.2013 PMID.24138885	**T cells**	Signature	PMID.24138885	643; 753; 1114; 1117; 3382; 4086; 4094; 5783; 6489; 7253; 8362; 8645; 8851; 9760; 10563; 10585; 23178; 23462; 27087; 27347; 54436; 55423; 56301; 57496; 57535; 63892; 92595; 28986; 4646; 4647; 5133; 5816
Tcells.Gamma.Delta Bindea Immunity.2013 PMID.24138885	**T cells**	Signature	PMID.24138885	6964; 6983; 9638; 10485; 11126; 445347
Tcells.Th1.cells Bindea Immunity.2013 PMID.24138885	**T cells**	Signature	PMID.24138885	323; 347; 684; 952; 970; 1437; 1493; 1803; 1839; 1847; 2678; 3458; 3595; 4049; 6351; 6443; 7804; 8418; 9143; 9162; 10079; 10950; 25975; 27033; 50616; 54674; 55816
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Tcells.Th2.cells Bindea Immunity.2013 PMID.24138885	**T cells**	Signature	PMID.24138885	107; 286; 332; 995; 1063; 1719; 2625; 2941; 3070; 3904; 4087; 4151; 5251; 5367; 5740; 6632; 7813; 8317; 9645; 10663; 11169; 23516; 51474; 54806; 55247; 55801; 728210
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Immune.87 Perez JCO.2015 PMID.2560586	**T cells**	Signature	PMID.2560586	3635; 729230; 3575; 3133; 3689; 3487; 7454; 10870; 3071; 7494; 81793; 6352; 7133; 3385; 3821; 4049; 3458; 4050; 959; 3394; 7412; 5729; 5734; 941; 4068; 54106; 973; 2833; 313; 695; 9934; 120425; 1235; 4069; 4065; 7852; 3683; 915; 5788; 976; 3561; 3766; 3932; 913; 2534; 11126; 6693; 5336; 3115; 3823; 9437; 3620; 916; 26191; 3112; 1233; 2826; 919; 10563; 84174; 3001; 718; 5168; 6932; 917; 6387; 10225; 54900; 974; 29126; 952; 5551; 1493; 84632; 5588; 80833; 1236; 29851; 6402; 10219;

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LCK Rody BreastCancerResearch.2008 PMID.19272155	**T cells**	Signature	PMID.19272155	55843; 22914; 54440; 9938; 6504; 55340; 4068; 1236; 3702; 28568; 5880; 11151; 5293; 9404; 5579; 6775; 9535; 6404; 10875; 2124; 1439; 3003; 64092; 55303; 3394; 3071; 3587; 28755; 3635; 51316; 6352; 919; 4050; 3561; 3059; 3575; 963; 1231; 3932; 915; 939; 3001; 6402; 28566; 914; 962; 6503; 3937; 5552; 5788
MCD3.CD8 Fan BMCMedGenomics.2011 PMID.21214954	**T cells**	Signature	PMID.21214954	3932; 390243; 151888; 5450; 4242; 115350; 84824; 9214; 51617; 1840; 940; 26999; 4068; 3111; 921; 9840; 27040; 89857; 2833; 4050; 84329; 6689; 1380; 30009; 10750; 10870; 3603; 643; 974; 51237; 931; 55843; 26228; 923; 8631; 926; 915; 914; 3702; 925; 917; 6402; 399; 3695; 3560; 1731; 27334; 939; 6775; 80342; 26279; 393; 26191; 9476; 1269; 168537; 84433
MERCK.Immune.Signature Cristescu Science.2018 PMID.30309915	**T cells**	Signature	PMID.30309915	6352; 939; 29126; 80381; 925; 1240; 4283; 10663; 3117; 3123; 3133; 3620; 3902; 4818; 80380; 5699; 6772; 201633
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Tcells.ImmuneProfiles.Mouse.Human Shay PNAS.2013 PMID.23382184	**T cells**	Signature	PMID.23382184	23; 120; 158; 166; 360; 399; 406; 472; 476; 596; 814; 841; 894; 914; 915; 916; 917; 919; 921; 923; 939; 940; 944; 955; 1107; 1236; 1455; 1477; 1493; 1540; 1606; 1643; 1778; 1936; 2071; 2073; 2113; 2145; 2308; 2534; 2580; 2617; 2625; 3097; 3268; 3337; 3384; 3396; 3561; 3572; 3575; 3603; 3655;

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Tcells.Regulatory Charoentong CellRep.2017 PMID.28052254	**T cells**	Signature	PMID.28052254	3988; 4035; 6349; 971; 23601; 50943; 3676; 3897; 115353; 8685; 4321; 4332; 4360; 64231; 53918; 5341; 11098; 5739; 7903; 23166
Tcells.Follicular.Helper Charoentong CellRep.2017 PMID.28052254	**T cells**	Signature	PMID.28052254	2247; 8829; 8480; 27087; 604; 4345; 9308; 8832; 8851; 1050; 51816; 55501; 10462; 50856; 9022; 1436; 1520; 23336; 1803; 2841; 10625; 3803; 5641; 2615; 4161; 100507436; 4684; 9436; 5133; 80380; 10016; 5052; 135250; 27036; 27180; 7301
Tcells.Th1.cells Charoentong CellRep.2017 PMID.28052254	**T cells**	Signature	PMID.28052254	1600; 84085; 3357; 6403; 27240; 101; 23382; 214; 8706; 166379; 683; 800; 977; 961; 962; 1043; 963; 966; 923; 968; 924; 970; 10225; 976; 10878; 1131; 64581; 91522; 1286; 50509; 220107; 8447; 11072; 2012; 8507; 2161; 54463; 9103; 5045; 139716; 2628; 9945; 2848; 64388; 26762; 3290; 30811; 3385; 3481; 3592; 3659; 3691; 4056; 11253; 4190; 284207; 23531; 55034; 5026; 92241; 6004; 6261; 60485; 6401; 30011; 89790; 8631; 51000; 6769; 30009; 80745; 201633; 51311; 7132; 7185; 10758; 9839
Tcells.Th17.cells Charoentong CellRep.2017 PMID.28052254	**T cells**	Signature	PMID.28052254	10803; 1084; 19; 5243; 81792; 286; 118932; 8707; 145741; 388125; 760; 23261; 85478; 958; 11251; 57560; 3605; 27189; 112744; 23765; 84818; 132014; 51561; 286676; 79836; 284948; 79155

Tcells.Th2 Charoentong CellRep.2017 PMID.28052254	**T cells**	Signature	PMID.28052254	10395; 8828; 64699; 51676; 332; 995; 8317; 1063; 1466; 10663; 1612; 1719; 56521; 1848; 7813; 2625; 2770; 2941; 3070; 55801; 3904; 27074; 114876; 5142; 22822; 5321; 5874; 27303; 54941
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Tcells.Follicular.Helper TCGA Immunity.2018 PMID.29628290	**T cells**	Signature	PMID.29628290	27087; 643; 753; 8851; 1114; 1117; 10563; 23462; 8362; 3382; 8645; 57535; 4094; 28986; 57496; 4646; 4647; 23178; 5133; 10585; 5783; 5816; 54436; 55423; 56301; 4086; 7972; 6489; 27347; 63892; 9760; 7253; 92595
Tcells.Gamma.Delta TCGA Immunity.2018 PMID.29628290	**T cells**	Signature	PMID.29628290	10485; 11126; 9638; 445347; 6964; 6983; 28531
Immune.CD8.GZMK TCGA.BRCA.1198 JCI.2020 PMID.32573490	**T cells**	Signature	PMID.32573490	729230; 497189; 1236; 2672; 387357; 84636; 387751; 10666; 959; 115352; 5133; 100188949; 120425; 9840; 56253; 8320; 283897; 5579; 22914; 256380; 29851; 201633; 29909; 151888; 128611; 925; 10663; 154075; 50852; 3003; 149628; 30009; 3001; 939; 4063; 6504; 4068; 114836; 917; 3702; 10225; 55423; 53347; 3932; 2833; 27240;

				915; 914; 916; 919; 921; 3561; 962; 84174; 6352; 4818; 5551; 923; 79037; 3004; 5790; 8698; 7535; 9744; 1731; 374403; 64926; 147138; 11184; 11151; 9051; 27040; 3718; 9806; 11262; 8530; 1043; 924; 80342
Immune.Cell.Content Verhaak NatCommun.2013 PMID.24113773	**T cells**	Signature	PMID.24113773	10320; 9910; 3575; 55303; 3106; 3937; 4046; 2533; 5341; 3055; 3587; 10859; 3071; 3903; 4688; 1536; 5788; 7805; 963; 2124; 6503; 3689; 4542; 3059; 4332; 3561; 962; 313; 6352; 4050; 9535; 474344; 3003; 7940; 8477; 10288; 7456; 951; 51411; 2207; 7305; 10875; 2313; 3394; 55843; 10019; 7133; 1794; 914; 9459; 11151; 23643; 4069; 3683; 7128; 6039; 7040; 9051; 8530; 5996; 2268; 6402; 64780; 80342; 3676; 9935; 397; 3566; 399; 3113; 4818; 4689; 9404; 3702; 6404; 3115; 915; 11314; 3560; 113; 5734; 5552; 919; 1236; 4478; 241; 5732; 5880; 2634; 7409; 9976; 9934; 4792; 6280; 10437; 64747; 9770; 1200; 391; 50856; 3002; 79037; 6279; 834; 597; 3133; 3820; 10578; 5873; 8807; 8459; 2014; 51291; 3932; 9235; 5790; 3965; 26112; 25939; 6890; 2633; 1520; 2999; 101; 2745; 5551; 969; 3108; 972; 22914; 5791; 3122; 8875; 10312; 1475; 7535; 3134; 3135; 1043; 9936; 939
TLS.Hallmark Cabrita Nature.2020 PMID.31942071	**TLS**	Signature	PMID.31942071	6363; 6366; 10563; 1236; 643; 27074; 6402
TLS.Known.Markers Cabrita Nature.2020 PMID.31942071	**TLS**	Signature	PMID.31942071	1236; 10563; 6363; 7852; 6366; 27074; 942; 604; 6402
TLS.12genes.Chemokine Zhu FrontImmunol.2017 PMID.28713385	**TLS**	Signature	PMID.28713385	6348; 6347; 10563; 6366; 4283; 6355; 6363; 6352; 6373; 6351; 6362; 3627

TLS.High.In.No.Response Helmink Nature.2020 PMID.31942075	**TLS**	Signature	PMID.31942075	51129; 7079; 80760; 4017; 5046; 5055; 374; 3451; 5212; 347; 8534; 133; 1917; 79884; 7056; 5522; 8862; 57722; 147495; 6098; 27295; 4099; 8515; 154664; 2260; 27237; 63982; 79054; 374946; 84929; 148281; 200162; 6620; 5009; 114788; 23743; 7087; 89886; 1770; 55511
TLS.High.In.Response.MCP Helmink Nature.2020 PMID.31942075	**TLS**	Signature	PMID.31942075	4283; 2633; 3001; 915; 3627; 8115; 973; 9235; 3620; 3512; 5450; 6890; 710; 51237; 3821; 923; 158471; 3659; 3458; 5920; 115361; 10396; 151888; 3824; 54900; 83416; 26279; 8368; 56145; 56146; 8395; 55118; 260436; 3738; 100423062; 91319; 389643
TLS.9genes Cabrita Nature.2020 PMID.31942071	**TLS**	Signature	PMID.31942071	5730; 912; 974; 1235; 27040; 1071; 83758; 9086; 8631
TLS.Tumors.w.TLS.and.CD8.vs.CD8.alone Cabrita Nature.2020 PMID.31942071	**TLS**	Signature	PMID.31942071	962; 4050; 1043; 915; 6402; 80342; 939; 51316; 9595; 973; 1236; 974; 4033; 952; 3957; 917; 919; 3512; 330; 51237; 6363; 8875; 6366; 730; 5790; 3112; 3394; 923; 27040; 912; 5730; 971; 54923; 1235; 7351; 54900; 64333; 374403; 81704; 11040; 9086; 54855; 1776; 5777; 5336; 8631; 55840; 114836; 160365; 202309; 115352; 83758; 1071; 79037

eTable 2. Comparison of Baseline Characteristics of the Patients From the CALGB 40601 Event-Free Survival (EFS) and Landmark Subpopulations

Characteristic	CALGB40601 EFS cohort (N = 230)	CALGB40601 Landmark cohort (N = 227)	p-value
Age (median, IQ range)	49 (41, 56)	49 (41, 56)	NS
Menopause status			NS
Postmenopausal	89 (38.70%)	87 (38.33%)	
Premenopausal	141 (61.30%)	140 (61.67%)	
HR status			NS
HR-negative	93 (40.43%)	91 (40.09%)	
HR-positive	137 (59.57%)	136 (59.91%)	
Clinical Stage			NS
Stage I	0 (0%)	0 (0%)	
Stage II	157 (68.26%)	156 (68.72%)	
Stage III	73 (31.74%)	71 (31.28%)	
Treatment			NS
HL +/- ET	0 (0%)	0 (0%)	
TH	89 (38.70%)	87 (38.33%)	
THL	95 (41.30%)	95 (41.85%)	
TL	46 (20%)	45 (19.82%)	
Intrinsic subtype			NS
Basal-like	19 (8.26%)	19 (8.37%)	
HER2-Enriched	131 (56.96%)	129 (56.83%)	
Luminal A	26 (11.30%)	26 (11.45%)	
Luminal B	32 (13.91%)	31 (13.66%)	
Normal-like	22 (9.57%)	22 (9.69%)	

Statistical differences were assessed using a Wilcoxon rank sum test (for the age) and Pearson's Chi-squared test (for the rest of the variables).
EFS: event-free survival; IQ: interquartile range; HR: hormone receptor; H: trastuzumab; L: lapatinib; ET: endocrine therapy; T: weekly paclitaxel; NS: no significant.

eTable 3. Correlation of Tumor-Infiltrating Lymphocytes (TILs) and Immune Gene Expression Signatures (iGES) in CALGB 40601 and PAMELA

CALGB 40601	Coefficient	p-value	Coefficient tertiles	p-value tertiles
Immune1 TCGA.BRCA.1198 JCI.2020 PMID.32573490	0.61	<0.001	0.53	<0.001
Stromal.Inflammation Heng JPathol.2017 PMID.27861902	0.6	<0.001	0.54	<0.001
TLS.High.In.Response.MCP Helmink Nature.2020 PMID.31942075	0.6	<0.001	0.53	<0.001
IFN.5.ImmLandscape Wolf PlosOne.2014 PMID.24516633	0.59	<0.001	0.55	<0.001
Tcells.CD4.Memory.Activated CIBERSORT NatMethods.2015 PMID.25822800	0.59	<0.001	0.57	<0.001
Plasma.cells ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715	0.59	<0.001	0.51	<0.001
NK.CD56dim Bindea Immunity.2013 PMID.24138885	0.58	<0.001	0.52	<0.001
Immune.Active Hollern Cell.2019 PMID.31730857	0.57	<0.001	0.50	<0.001
CTLA4.Single.Gene Hollern Cell.2019 PMID.31730857	0.57	<0.001	0.51	<0.001
Tcells.Cluster Iglesia CCR.2014 PMID.24916698	0.56	<0.001	0.49	<0.001
Bcells.Plasma.cells.52genes Miller GenomeBiol.2013 PMID.23618380	0.56	<0.001	0.52	<0.001
IGG.Cluster Fan BMCMedGenomics.2011 PMID.21214954	0.56	<0.001	0.51	<0.001
PDCD1.Single.Gene Pare AnnOncol.2019 PMID.30165419	0.56	<0.001	0.50	<0.001
Macrophages.M1 CIBERSORT NatMethods.2015 PMID.25822800	0.55	<0.001	0.51	<0.001
Immune.CD8.GZMK TCGA.BRCA.1198 JCI.2020 PMID.32573490	0.55	<0.001	0.48	<0.001
CD8.Cluster Iglesia CCR.2014 PMID.24916698	0.55	<0.001	0.47	<0.001
Cytotoxic.Lymphocytes.MCP Petitprez Nature.2020 PMID.31942077	0.55	<0.001	0.51	<0.001
Cytotoxic.cells Bindea Immunity.2013 PMID.24138885	0.55	<0.001	0.49	<0.001
Tcells.Survival.2gene Petitprez Nature.2020 PMID.31942077	0.55	<0.001	0.49	<0.001
CTLA4.Pathway GSEA.BIOCARTA ProcNatlAcadSciUSA.2005 PMID.16199517	0.55	<0.001	0.49	<0.001
Immune.CTLA4.CXCL.FOXP3 TCGA.BRCA.1198 JCI.2020 PMID.32573490.	0.55	<0.001	0.52	<0.001
Immune.Suppression Kardos JCIInsight.2016 PMID.27699256	0.54	<0.001	0.52	<0.001
Tcells.CD8.Memory.vs.Naive.Metagene.3 Pauken Science.2016 PMID.27789795	0.54	<0.001	0.50	<0.001
Ig TCGA.BRCA.1198 Cell.2015 PMID.26451490	0.54	<0.001	0.49	<0.001

Tcells.Gamma.Delta CIBERSORT NatMethods.2015 PMID.25822800	0.54	<0.001	0.45	<0.001
MERCK.Immune.Signature Cristescu Science.2018 PMID.30309915	0.54	<0.001	0.45	<0.001
Immune.87 Perez JCO.2015 PMID.2560586	0.54	<0.001	0.46	<0.001
Tcells.Th1.cells Bindea Immunity.2013 PMID.24138885	0.54	<0.001	0.53	<0.001
CD274.Single.Gene Hollern Cell.2019 PMID.31730857	0.54	<0.001	0.51	<0.001
Bcells.Immature Charoentong CellRep.2017 PMID.28052254	0.54	<0.001	0.48	<0.001
Tcells.CD8 CIBERSORT NatMethods.2015 PMID.25822800	0.53	<0.001	0.47	<0.001
NK.Resting CIBERSORT NatMethods.2015 PMID.25822800	0.53	<0.001	0.45	<0.001
Immune.cell.Cluster.PerouLab Fan.GSEA.GP2 BMCMedGenomics.2011 PMID.21214954	0.53	<0.001	0.51	<0.001
Tcells.MCP Petitprez Nature.2020 PMID.31942077	0.53	<0.001	0.48	<0.001
Immune.Hot.vs.Cold.CD8 Cabrita Nature.2020 PMID.31942071	0.53	<0.001	0.48	<0.001
Immune.CD4.CD53.CD84.BTK TCGA.BRCA.1198 JCI.2020 PMID.32573490	0.53	<0.001	0.48	<0.001
MHC.II Rody BreastCancerResearch.2008 PMID.19272155	0.53	<0.001	0.47	<0.001
Tcells.Resident.Memory.Single.cell Savas NatMed.2018 PMID.29942092	0.52	<0.001	0.46	<0.001
Tcells.Follicular.Helper CIBERSORT NatMethods.2015 PMID.25822800	0.52	<0.001	0.45	<0.001
Tcells.CD4.Memory.Resting CIBERSORT NatMethods.2015 PMID.25822800	0.52	<0.001	0.42	<0.001
Tcells Bindea Immunity.2013 PMID.24138885	0.52	<0.001	0.42	<0.001
Tcells.Th1.cells Charoentong CellRep.2017 PMID.28052254	0.52	<0.001	0.46	<0.001
Cytolytic.Activity Rooney Cell.2015 PMID.25594174	0.51	<0.001	0.45	<0.001
NK ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715	0.51	<0.001	0.48	<0.001
MCD3.CD8 Fan BMCMedGenomics.2011 PMID.21214954	0.51	<0.001	0.43	<0.001
NK.Activated CIBERSORT NatMethods.2015 PMID.25822800	0.51	<0.001	0.46	<0.001
Dendritic.cells.Activated Bindea Immunity.2013 PMID.24138885	0.51	<0.001	0.51	<0.001
Macrophages.Th1.Cluster Iglesia CCR.2014 PMID.24916698	0.51	<0.001	0.48	<0.001
Tcells.CD8.Activated Charoentong CellRep.2017 PMID.28052254	0.51	<0.001	0.45	<0.001
STAT1 Rody BreastCancerResearch.2008 PMID.19272155	0.5	<0.001	0.48	<0.001
Tcells.Regulatory.Tregs CIBERSORT NatMethods.2015 PMID.25822800	0.5	<0.001	0.41	<0.001

TLS.Tumors.w.TLS.and.CD8.vs.CD8.alone Cabrita Nature.2020 PMID.31942071	0.5	<0.001	0.44	<0.001
Plasma.cells CIBERSORT NatMethods.2015 PMID.25822800	0.5	<0.001	0.45	<0.001
Bcells.IL10.Plus Lin JImmunol.2014 PMID.25080484	0.5	<0.001	0.48	<0.001
Macrophages.Monocytes.CSF1.Response Beck CCR.2009 PMID.19188147	0.5	<0.001	0.49	<0.001
CSF1.Response TCGA Immunity.2018 PMID.29628290	0.5	<0.001	0.49	<0.001
MDSC Charoentong CellRep.2017 PMID.28052254	0.5	<0.001	0.50	<0.001
Tcells.CD8.Exhausted.at.day.8.post.Imm.vs. Naive.Metagene.1 Pauken Science.2016 PMID.27789795	0.5	<0.001	0.47	<0.001
Bcells.Cluster Iglesia CCR.2014 PMID.24916698	0.5	<0.001	0.48	<0.001
Tcells.CD8.Memory.vs.Naive.1 Pauken Science.2016 PMID.27789795	0.5	<0.001	0.45	<0.001
Tcells.CD8.Memory.vs.Naive.Metagene.1 Pauken Science.2016 PMID.27789795	0.5	<0.001	0.45	<0.001
Tcells.NK.51genes Miller GenomeBiol.2013 PMID.23618380	0.49	<0.001	0.42	<0.001
Immune.Cell.Content Verhaak NatCommun.2013 PMID.24113773	0.49	<0.001	0.46	<0.001
Tcells ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715	0.49	<0.001	0.42	<0.001
LCK Rody BreastCancerResearch.2008 PMID.19272155	0.49	<0.001	0.46	<0.001
Tcells.Bcells.Lymphocyte.Infiltration Calabro BreastCancerResTreat.2009 PMID.18592372	0.49	<0.001	0.39	<0.001
Lymphocyte.Infiltration.Expression.Score TCGA Immunity.2018 PMID.29628290	0.49	<0.001	0.39	<0.001
Tcells.CD8.Exhausted.vs.Naive.Metagene.1 Pauken Science.2016 PMID.27789795	0.49	<0.001	0.46	<0.001
Tcells.CD4.Activated Charoentong CellRep.2017 PMID.28052254	0.49	<0.001	0.48	<0.001
Tcells.CD8.Exhausted.vs.Naive.Metagene.3 Pauken Science.2016 PMID.27789795	0.49	<0.001	0.43	<0.001
IgG Rody BreastCancerResearch.2008 PMID.19272155	0.48	<0.001	0.44	<0.001
TLS.12genes.Chemokine Zhu FrontImmunol.2017 PMID.28713385	0.48	<0.001	0.45	<0.001
Tcells.Bcell.KEGG.hematopoietic.cell.lineage GSEA.GP2 ProcNatlAcadSciUSA.2005 PMID.16199517	0.48	<0.001	0.42	<0.001
Tcells.NK.Metagene Miller GenomeBiol.2013 PMID.23618380	0.48	<0.001	0.44	<0.001
Monocytes.Dendritic.25genes Miller GenomeBiol.2013 PMID.23618380	0.48	<0.001	0.46	<0.001
Bcells ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715	0.48	<0.001	0.43	<0.001
Tcells.CD4.Naive CIBERSORT NatMethods.2015 PMID.25822800	0.47	<0.001	0.41	<0.001

Bcells.Plasma.cells.Metagene Miller GenomeBiol.2013 PMID.23618380	0.47	<0.001	0.43	<0.001
Tcells.CD8.MCP Petitprez Nature.2020 PMID.31942077	0.46	<0.001	0.35	<0.001
Bcells.Plasmablast Dybaer JCO.2015 PMID.25800755	0.46	<0.001	0.39	<0.001
Dendritic.cells.Activated CIBERSORT NatMethods.2015 PMID.25822800	0.46	<0.001	0.44	<0.001
Bcells.Memory CIBERSORT NatMethods.2015 PMID.25822800	0.46	<0.001	0.41	<0.001
Tcells.CD8.Memory.vs.Naive.Metagene.2 Pauken Science.2016 PMID.27789795	0.46	<0.001	0.41	<0.001
MHC.11genes Forero CancerImmunolRes.2016 PMID.26980599	0.46	<0.001	0.42	<0.001
Immune.HLA.D TCGA.BRCA.1198 JCI.2020 PMID.32573490	0.46	<0.001	0.38	<0.001
Tcells.CD8.Effector.Memory Charoentong CellRep.2017 PMID.28052254	0.45	<0.001	0.40	<0.001
Immune.CD19 TCGA.BRCA.1198 JCI.2020 PMID.32573490	0.45	<0.001	0.38	<0.001
Tcells.Regulatory Charoentong CellRep.2017 PMID.28052254	0.45	<0.001	0.43	<0.001
Tcells.Activation Petitprez Nature.2020 PMID.31942077	0.45	<0.001	0.42	<0.001
Dendritic.cells.Activated Charoentong CellRep.2017 PMID.28052254	0.45	<0.001	0.44	<0.001
Bcells Bindea Immunity.2013 PMID.24138885	0.44	<0.001	0.37	<0.001
Bcells.Naive CIBERSORT NatMethods.2015 PMID.25822800	0.44	<0.001	0.39	<0.001
PD1.Signaling.Reactome GSEA ProcNatlAcadSciUSA.2005 PMID.16199517	0.44	<0.001	0.41	<0.001
Bcells.ImmuneProfiles.Mouse.Human Shay PNAS.2013 PMID.23382184	0.43	<0.001	0.34	<0.001
Immune.HLA.A.F TCGA.BRCA.1198 JCI.2020 PMID.32573490	0.43	<0.001	0.41	<0.001
Bcells.Activated Charoentong CellRep.2017 PMID.28052254	0.43	<0.001	0.36	<0.001
Macrophages ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715	0.43	<0.001	0.46	<0.001
Monocytes.Dendritic.cell.Metagene Miller GenomeBiol.2013 PMID.23618380	0.43	<0.001	0.34	<0.001
MHC.I Rody BreastCancerResearch.2008 PMID.19272155	0.42	<0.001	0.35	<0.001
Neutrophils.Activated.Lung Janiszewska NatCellBiol.2019 PMID.31263265	0.42	<0.001	0.36	<0.001
MHC.I.CoreGenes Lauss NatCommun.2017 PMID29170503	0.41	<0.001	0.38	<0.001
Bcells Garber CellMolGastroenterolHepatol.2017 PMID.28508029	0.41	<0.001	0.38	<0.001
NK.MCP Helmink Nature.2020 PMID.31942077	0.41	<0.001	0.29	<0.001
Monocytes CIBERSORT NatMethods.2015 PMID.25822800	0.41	<0.001	0.45	<0.001

HCK Rody BreastCancerResearch.2008 PMID.19272155	0.41	<0.001	0.43	<0.001
TLS.Known.Markers Cabrita Nature.2020 PMID.31942071	0.4	<0.001	0.36	<0.001
Monocytes ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715	0.4	<0.001	0.35	<0.001
MDSC.Neutrophil Youn LeukocBiol.2012 PMID.21954284	0.39	<0.001	0.36	<0.001
Macrophages.M0 CIBERSORT NatMethods.2015 PMID.25822800	0.39	<0.001	0.44	<0.001
TLS.Hallmark Cabrita Nature.2020 PMID.31942071	0.37	<0.001	0.30	<0.001
Tcells.ImmuneProfiles.Mouse.Human Shay PNAS.2013 PMID.23382184	0.37	<0.001	0.34	<0.001
Tcells.Central.Memory Bindea Immunity.2013 PMID.24138885	0.37	<0.001	0.26	<0.001
Neutrophils CIBERSORT NatMethods.2015 PMID.25822800	0.37	<0.001	0.36	<0.001
Bcells.Tcells.Cooperation Hollern Cell.2019 PMID.31730857	0.35	<0.001	0.28	<0.001
Immune.GIMAP.IL16 TCGA.BRCA.1198 JCI.2020 PMID.32573490	0.35	<0.001	0.32	<0.001
Tcells.CD8.Exhausted.Anti.PDL1.vs.Control. Metagene.1 Pauken Science.2016 PMID.27789795	0.35	<0.001	0.39	<0.001
IFNg.Module11 Gatza ProcNatlAcadSciUSA.2010 PMID.20335537	0.35	<0.001	0.36	<0.001
IFN.Cluster.GSEA.GP11 Fan BMCMedGenomics.2011 PMID.21214954	0.35	<0.001	0.37	<0.001
Bcells.IL10.Minus Lin JImmunol.2014 PMID.25080484	0.33	<0.001	0.27	<0.001
Monocytes Charoentong CellRep.2017 PMID.28052254	0.33	<0.001	0.27	<0.001
Dendritic.cells.Resting CIBERSORT NatMethods.2015 PMID.25822800	0.33	<0.001	0.32	<0.001
Eosinophils CIBERSORT NatMethods.2015 PMID.25822800	0.33	<0.001	0.31	<0.001
TLS.9genes Cabrita Nature.2020 PMID.31942071	0.32	<0.001	0.24	<0.001
Bcells.Extended Garber CellMolGastroenterolHepatol.2017 PMID.28508029	0.31	<0.001	0.29	<0.001
Macrophages Bindea Immunity.2013 PMID.24138885	0.31	<0.001	0.31	<0.001
Tcells.Gamma.Delta Bindea Immunity.2013 PMID.24138885	0.31	<0.001	0.26	<0.001
Tcells.Gamma.Delta TCGA Immunity.2018 PMID.29628290	0.31	<0.001	0.26	<0.001
Tcells.CD8.Exhausted.vs.AntiPDL1.2 Pauken Science.2016 PMID.27789795	0.31	<0.001	0.28	<0.001
Tcells.Follicular.Helper Bindea Immunity.2013 PMID.24138885	0.3	<0.001	0.26	<0.001
Tcells.Follicular.Helper TCGA Immunity.2018 PMID.29628290	0.3	<0.001	0.26	<0.001

Macrophages.M2 CIBERSORT NatMethods.2015 PMID.25822800	0.3	<0.001	0.27	<0.001
Bcells.Centrocyte Dybaer JCO.2015 PMID.25800755	0.28	<0.001	0.25	<0.001
MDSC.Tumor.Macrophages Schlecker JImmunol.2012 PMID.23152559	0.28	<0.001	0.30	<0.001
Bcells.Memory Dybaer JCO.2015 PMID.25800755	0.28	<0.001	0.27	<0.001
IFNa.Module10 Gatza ProcNatlAcadSciUSA.2010 PMID.20335537	0.28	<0.001	0.33	<0.001
Granulocytes.ImmuneProfiles.Mouse.Human Shay PNAS.2013 PMID.23382184	0.28	<0.001	0.28	<0.001
Dendritic.cells Bindea Immunity.2013 PMID.24138885	0.26	<0.001	0.26	<0.001
IFN.Pathway ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715	0.26	<0.001	0.29	<0.001
Tcells.CD8.Exhausted.vs.Naive.2 Pauken Science.2016 PMID.27789795	0.25	0.001	0.23	0.001
Influenza.11genes Khatri Immunity.2015 PMID.26682989	0.25	<0.001	0.26	<0.001
Immune.14 Perez JCO.2015 PMID.2560586	0.24	<0.001	0.23	0.001
Macrophages.M2 Ghassabeh Blood.2006 PMID.16556895	0.23	0.001	0.22	0.001
CD68.Cluster Iglesia CCR.2014 PMID.24916698	0.23	0.001	0.21	0.002
Proliferation.Pathway ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715	0.23	0.003	0.22	0.001
Tcells.CD8.Effector.vs.Naive.2 Pauken Science.2016 PMID.27789795	0.23	0.003	0.22	0.001
Tcells.CD4.Effector.Memory Charoentong CellRep.2017 PMID.28052254	0.23	<0.001	0.25	<0.001
Mast.cells.Resting CIBERSORT NatMethods.2015 PMID.25822800	0.23	<0.001	0.18	0.01
Mast.cell Charoentong CellRep.2017 PMID.28052254	0.22	0.001	0.23	0.001
Tcells.Regulatory.cell.2gene Petitprez Nature.2020 PMID.31942077	0.22	0.001	0.17	0.01
Neutrophils ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715	0.22	<0.001	0.27	<0.001
Denditic.cells.ImmuneProfiles.Mouse.Human Shay PNAS.2013 PMID.23382184	0.21	0.003	0.24	<0.001
Bcells.Centroblast Dybaer JCO.2015 PMID.25800755	0.21	0.004	0.16	0.02
Tcells.Follicular.Helper Charoentong CellRep.2017 PMID.28052254	0.2	0.001	0.21	0.002
MDSC.Tumor Schlecker JImmunol.2012 PMID.23152559	0.2	0.001	0.22	0.001
Serum.Response.Up TCGA Immunity.2018 PMID.29628290	0.2	0.001	0.12	0.07
Neutrophils Bindea Immunity.2013 PMID.24138885	0.2	0.013	0.23	0.001
Tcells.Th2 Charoentong CellRep.2017 PMID.28052254	0.18	<0.001	0.17	0.01

Bcells.Naive Dybaer JCO.2015 PMID.25800755	0.17	0.002	0.14	0.04
NK.ImmuneProfiles.Mouse.Human Shay PNAS.2013 PMID.23382184	0.17	0.002	0.17	0.01
Wound.Healing Chang PlosBiol.2004 PMID.14737219	0.17	0.003	0.15	0.03
MHC.24genes Forero CancerImmunolRes.2016 PMID.26980599	0.17	0.008	0.15	0.03
Mast.cells.Activated CIBERSORT NatMethods.2015 PMID.25822800	0.17	0.009	0.13	0.07
NK Charoentong CellRep.2017 PMID.28052254	0.17	0.01	0.17	0.01
NK.Tcell Charoentong CellRep.2017 PMID.28052254	0.17	0.01	0.22	0.001
IFN.Cluster Fan BMCMedGenomics.2011 PMID.21214954	0.17	0.02	0.20	0.003
Immune.IFN TCGA.BRCA.1198 JCI.2020 PMID.32573490	0.17	0.03	0.20	0.003
Tcells.CD8 Bindea Immunity.2013 PMID.24138885	0.17	0.03	0.05	0.47
IFN.3.ImmLandscape Wolf PlosOne.2014 PMID.24516633	0.17	0.04	0.20	0.002
IFN.Score.module3 TCGA Immunity.2018 PMID.29628290	0.17	0.04	0.20	0.002
Eosinophils Charoentong CellRep.2017 PMID.28052254	0.15	0.03	0.17	0.014
Tcells.Thelper Bindea Immunity.2013 PMID.24138885	0.14	0.012	0.07	0.29
Tcells.Th17.cells Charoentong CellRep.2017 PMID.28052254	0.11	0.03	0.08	0.22
Dendritic.cells.Immature. Charoentong CellRep.2017 PMID.28052254	0.1	0.04	0.14	0.05
Mast.cells Bindea Immunity.2013 PMID.24138885	-0.14	0.04	-0.10	0.14
Eosinophils Bindea Immunity.2013 PMID.24138885	-0.16	0.03	-0.07	0.34
Immunosuppression Petitprez Nature.2020 PMID.31942077	-0.17	0.01	-0.11	0.10
Tcells.Th17.cells Bindea Immunity.2013 PMID.24138885	-0.18	0.04	-0.16	0.02
TGFB.score TCGA Immunity.2018 PMID.29628290	-0.26	<0.001	-0.19	0.006
TLS.High.In.No.Response Helmink Nature.2020 PMID.31942075	-0.29	<0.001	-0.24	<0.001
PAMELA	**Coefficient**	**p-value**		
IFN.5.ImmLandscape Wolf PlosOne.2014 PMID.24516633	0.71	<0.001	0.64	<0.001
Stromal.Inflammation Heng JPathol.2017 PMID.27861902	0.7	<0.001	0.63	<0.001
TLS.High.In.Response.MCP Helmink Nature.2020 PMID.31942075	0.65	<0.001	0.58	<0.001
Tcells.Bcell.Cluster Fan BMCMedGenomics.2011 PMID.21214954	0.68	<0.001	0.62	<0.001

Tcells.CD4.Memory.Activated CIBERSORT NatMethods.2015 PMID.25822800	0.69	<0.001	0.62	<0.001
Immune.Active Hollern Cell.2019 PMID.31730857	0.67	<0.001	0.62	<0.001
Tcells.Cluster Iglesia CCR.2014 PMID.24916698	0.66	<0.001	0.64	<0.001
Tcells.CD8 CIBERSORT NatMethods.2015 PMID.25822800	0.65	<0.001	0.64	<0.001
CD8.Cluster Iglesia CCR.2014 PMID.24916698	0.65	<0.001	0.62	<0.001
Cytotoxic.cells Bindea Immunity.2013 PMID.24138885	0.66	<0.001	0.62	<0.001
Immune.CD8.GZMK TCGA.BRCA.1198 JCI.2020 PMID.32573490	0.65	<0.001	0.62	<0.001
Macrophages.M1 CIBERSORT NatMethods.2015 PMID.25822800	0.68	<0.001	0.62	<0.001
Tcells ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715	0.63	<0.001	0.63	<0.001
NK.Activated CIBERSORT NatMethods.2015 PMID.25822800	0.63	<0.001	0.59	<0.001
Tcells.Resident.Memory.Single.cell Savas NatMed.2018 PMID.29942092	0.64	<0.001	0.60	<0.001
Immune.Hot.vs.Cold.CD8 Cabrita Nature.2020 PMID.31942071	0.66	<0.001	0.64	<0.001
Tcells.Follicular.Helper CIBERSORT NatMethods.2015 PMID.25822800	0.65	<0.001	0.61	<0.001
Immune.87 Perez JCO.2015 PMID.2560586	0.65	<0.001	0.62	<0.001
Immune.Cell.Content Verhaak NatCommun.2013 PMID.24113773	0.64	<0.001	0.63	<0.001
Tcells.Gamma.Delta CIBERSORT NatMethods.2015 PMID.25822800	0.61	<0.001	0.54	<0.001
LCK Rody BreastCancerResearch.2008 PMID.19272155	0.64	<0.001	0.59	<0.001
Tcells.CD4.Memory.Resting CIBERSORT NatMethods.2015 PMID.25822800	0.63	<0.001	0.63	<0.001
MCD3.CD8 Fan BMCMedGenomics.2011 PMID.21214954	0.62	<0.001	0.54	<0.001
Tcells.MCP Petitprez Nature.2020 PMID.31942077	0.66	<0.001	0.57	<0.001
Tcells.CD8.Activated Charoentong CellRep.2017 PMID.28052254	0.65	<0.001	0.57	<0.001
TLS.Tumors.w.TLS.and.CD8.vs.CD8.alone Cabrita Nature.2020 PMID.31942071	0.62	<0.001	0.59	<0.001
Tcells Bindea Immunity.2013 PMID.24138885	0.64	<0.001	0.62	<0.001
Tcells.NK.51genes Miller GenomeBiol.2013 PMID.23618380	0.63	<0.001	0.59	<0.001
MERCK.Immune.Signature Cristescu Science.2018 PMID.30309915	0.68	<0.001	0.68	<0.001
NK.Resting CIBERSORT NatMethods.2015 PMID.25822800	0.62	<0.001	0.55	<0.001
Tcells.Bcells.Lymphocyte.Infiltration Calabro BreastCancerResTreat.2009 PMID.18592372	0.63	<0.001	0.57	<0.001

Lymphocyte.Infiltration.Expression.Score TCGA Immunity.2018 PMID.29628290	0.63	<0.001	0.57	<0.001
Tcells.NK.Metagene Miller GenomeBiol.2013 PMID.23618380	0.61	<0.001	0.56	<0.001
Immune.CTLA4.CXCL.FOXP3 TCGA.BRCA.1198 JCI.2020 PMID.32573490.	0.71	<0.001	0.67	<0.001
NK.CD56dim Bindea Immunity.2013 PMID.24138885	0.64	<0.001	0.61	<0.001
CTLA4.Pathway GSEA.BIOCARTA ProcNatlAcadSciUSA.2005 PMID.16199517	0.65	<0.001	0.61	<0.001
Dendritic.cells.Activated Bindea Immunity.2013 PMID.24138885	0.65	<0.001	0.65	<0.001
Immune.CD4.CD53.CD84.BTK TCGA.BRCA.1198 JCI.2020 PMID.32573490	0.62	<0.001	0.62	<0.001
Cytotoxic.Lymphocytes.MCP Petitprez Nature.2020 PMID.31942077	0.6	<0.001	0.57	<0.001
TLS.12genes.Chemokine Zhu FrontImmunol.2017 PMID.28713385	0.66	<0.001	0.64	<0.001
Tcells.Regulatory.Tregs CIBERSORT NatMethods.2015 PMID.25822800	0.61	<0.001	0.57	<0.001
IGG.Cluster Fan BMCMedGenomics.2011 PMID.21214954	0.62	<0.001	0.52	<0.001
Macrophages.Th1.Cluster Iglesia CCR.2014 PMID.24916698	0.63	<0.001	0.62	<0.001
Tcells.CD4.Naive CIBERSORT NatMethods.2015 PMID.25822800	0.59	<0.001	0.59	<0.001
Immune.Suppression Kardos JCIInsight.2016 PMID.27699256	0.67	<0.001	0.64	<0.001
Immune1 TCGA.BRCA.1198 JCI.2020 PMID.32573490	0.61	<0.001	0.54	<0.001
Tcells.CD4.Activated Charoentong CellRep.2017 PMID.28052254	0.64	<0.001	0.60	<0.001
Macrophages.Monocytes.CSF1.Response Beck CCR.2009 PMID.19188147	0.62	<0.001	0.60	<0.001
CSF1.Response TCGA Immunity.2018 PMID.29628290	0.62	<0.001	0.60	<0.001
Tcells.Bcell.KEGG.hematopoietic.cell.lineage GSEA.GP2 ProcNatlAcadSciUSA.2005 PMID.16199517	0.62	<0.001	0.59	<0.001
STAT1 Rody BreastCancerResearch.2008 PMID.19272155	0.68	<0.001	0.66	<0.001
CD274.Single.Gene Hollern Cell.2019 PMID.31730857	0.65	<0.001	0.64	<0.001
Bcells.IL10.Plus Lin JImmunol.2014 PMID.25080484	0.58	<0.001	0.51	<0.001
Tcells.CD8.Effector.Memory Charoentong CellRep.2017 PMID.28052254	0.59	<0.001	0.58	<0.001
MHC.II Rody BreastCancerResearch.2008 PMID.19272155	0.65	<0.001	0.63	<0.001
Tcells.CD8.Exhausted.at.day.8.post.Imm.vs. Naive.Metagene.1 Pauken Science.2016 PMID.27789795	0.62	<0.001	0.56	<0.001
Dendritic.cells.Activated CIBERSORT NatMethods.2015 PMID.25822800	0.64	<0.001	0.61	<0.001

Cytolytic.Activity Rooney Cell.2015 PMID.25594174	0.61	<0.001	0.59	<0.001
Tcells.Th1.cells Bindea Immunity.2013 PMID.24138885	0.57	<0.001	0.54	<0.001
Tcells.CD8.Memory.vs.Naive.1 Pauken Science.2016 PMID.27789795	0.64	<0.001	0.60	<0.001
Tcells.CD8.Memory.vs.Naive.Metagene.1 Pauken Science.2016 PMID.27789795	0.64	<0.001	0.60	<0.001
Bcells.Immature Charoentong CellRep.2017 PMID.28052254	0.57	<0.001	0.56	<0.001
Immune.GIMAP.IL16 TCGA.BRCA.1198 JCI.2020 PMID.32573490	0.51	<0.001	0.51	<0.001
TLS.Known.Markers Cabrita Nature.2020 PMID.31942071	0.58	<0.001	0.53	<0.001
Immune.HLA.A.F TCGA.BRCA.1198 JCI.2020 PMID.32573490	0.62	<0.001	0.60	<0.001
NK ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715	0.55	<0.001	0.52	<0.001
Tcells.CD8.Exhausted.vs.Naive.Metagene.3 Pauken Science.2016 PMID.27789795	0.61	<0.001	0.58	<0.001
Bcells.Memory CIBERSORT NatMethods.2015 PMID.25822800	0.57	<0.001	0.47	<0.001
Tcells.CD8.Memory.vs.Naive.Metagene.3 Pauken Science.2016 PMID.27789795	0.61	<0.001	0.55	<0.001
Tcells.CD8.MCP Petitprez Nature.2020 PMID.31942077	0.65	<0.001	0.66	<0.001
Plasma.cells CIBERSORT NatMethods.2015 PMID.25822800	0.55	<0.001	0.47	<0.001
Monocytes.Dendritic.25genes Miller GenomeBiol.2013 PMID.23618380	0.6	<0.001	0.59	<0.001
Bcells ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715	0.54	<0.001	0.47	<0.001
TLS.Hallmark Cabrita Nature.2020 PMID.31942071	0.54	<0.001	0.48	<0.001
MDSC Charoentong CellRep.2017 PMID.28052254	0.57	<0.001	0.50	<0.001
HCK Rody BreastCancerResearch.2008 PMID.19272155	0.61	<0.001	0.56	<0.001
Bcells.Naive CIBERSORT NatMethods.2015 PMID.25822800	0.53	<0.001	0.44	<0.001
Macrophages.M0 CIBERSORT NatMethods.2015 PMID.25822800	0.62	<0.001	0.60	<0.001
CTLA4.Single.Gene Hollern Cell.2019 PMID.31730857	0.66	<0.001	0.63	<0.001
Macrophages ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715	0.63	<0.001	0.63	<0.001
Bcells.Plasma.cells.52genes Miller GenomeBiol.2013 PMID.23618380	0.57	<0.001	0.49	<0.001
Tcells.Th1.cells Charoentong CellRep.2017 PMID.28052254	0.57	<0.001	0.55	<0.001
Bcells.Cluster Iglesia CCR.2014 PMID.24916698	0.53	<0.001	0.44	<0.001
Tcells.Regulatory Charoentong CellRep.2017 PMID.28052254	0.55	<0.001	0.50	<0.001

Ig TCGA.BRCA.1198 Cell.2015 PMID.26451490	0.55	<0.001	0.49	<0.001
Monocytes ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715	0.6	<0.001	0.57	<0.001
Tcells.CD8.Exhausted.vs.Naive.Metagene.1 Pauken Science.2016 PMID.27789795	0.56	<0.001	0.53	<0.001
Bcells.Tcells.Cooperation Hollern Cell.2019 PMID.31730857	0.5	<0.001	0.40	<0.001
Bcells.Activated Charoentong CellRep.2017 PMID.28052254	0.52	<0.001	0.41	<0.001
Bcells Bindea Immunity.2013 PMID.24138885	0.5	<0.001	0.42	<0.001
Macrophages.M2 CIBERSORT NatMethods.2015 PMID.25822800	0.54	<0.001	0.61	<0.001
Tcells.CD8.Memory.vs.Naive.Metagene.2 Pauken Science.2016 PMID.27789795	0.54	<0.001	0.56	<0.001
MHC.I Rody BreastCancerResearch.2008 PMID.19272155	0.56	<0.001	0.55	<0.001
Immune.HLA.D TCGA.BRCA.1198 JCI.2020 PMID.32573490	0.55	<0.001	0.50	<0.001
Dendritic.cells.Activated Charoentong CellRep.2017 PMID.28052254	0.54	<0.001	0.52	<0.001
PD1.Signaling.Reactome GSEA ProcNatlAcadSciUSA.2005 PMID.16199517	0.5	<0.001	0.50	<0.001
Dendritic.cells.Resting CIBERSORT NatMethods.2015 PMID.25822800	0.55	<0.001	0.55	<0.001
TLS.9genes Cabrita Nature.2020 PMID.31942071	0.45	<0.001	0.42	<0.001
MHC.I.CoreGenes Lauss NatCommun.2017 PMID29170503	0.57	<0.001	0.59	<0.001
Tcells.ImmuneProfiles.Mouse.Human Shay PNAS.2013 PMID.23382184	0.39	<0.001	0.43	<0.001
Bcells.Plasma.cells.Metagene Miller GenomeBiol.2013 PMID.23618380	0.52	<0.001	0.44	<0.001
Immune.CD19 TCGA.BRCA.1198 JCI.2020 PMID.32573490	0.5	<0.001	0.43	<0.001
Bcells Garber CellMolGastroenterolHepatol.2017 PMID.28508029	0.51	<0.001	0.45	<0.001
MDSC.Neutrophil Youn LeukocBiol.2012 PMID.21954284	0.55	<0.001	0.54	<0.001
MHC.11genes Forero CancerImmunolRes.2016 PMID.26980599	0.47	<0.001	0.39	<0.001
Monocytes CIBERSORT NatMethods.2015 PMID.25822800	0.55	<0.001	0.51	<0.001
Bcells.Plasmablast Dybaer JCO.2015 PMID.25800755	0.47	<0.001	0.40	<0.001
Tcells.CD8.Exhausted.Anti.PDL1.vs.Control. Metagene.1 Pauken Science.2016 PMID.27789795	0.52	<0.001	0.53	<0.001
IFN.Cluster.GSEA.GP11 Fan BMCMedGenomics.2011 PMID.21214954	0.53	<0.001	0.48	<0.001
Plasma.cells ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715	0.52	<0.001	0.45	<0.001

IFNg.Module11 Gatza ProcNatlAcadSciUSA.2010 PMID.20335537	0.51	<0.001	0.49	<0.001
Monocytes.Dendritic.cell.Metagene Miller GenomeBiol.2013 PMID.23618380	0.53	<0.001	0.59	<0.001
Tcells.Activation Petitprez Nature.2020 PMID.31942077	0.59	<0.001	0.57	<0.001
Eosinophils CIBERSORT NatMethods.2015 PMID.25822800	0.5	<0.001	0.42	<0.001
IgG Rody BreastCancerResearch.2008 PMID.19272155	0.51	<0.001	0.41	<0.001
Tcells.Survival.2gene Petitprez Nature.2020 PMID.31942077	0.5	<0.001	0.49	<0.001
Immune.14 Perez JCO.2015 PMID.2560586	0.45	<0.001	0.45	<0.001
Dendritic.cells Bindea Immunity.2013 PMID.24138885	0.48	<0.001	0.46	<0.001
Bcells.ImmuneProfiles.Mouse.Human Shay PNAS.2013 PMID.23382184	0.38	<0.001	0.39	<0.001
Tcells.Th17.cells Charoentong CellRep.2017 PMID.28052254	0.44	<0.001	0.33	<0.001
PDCD1.Single.Gene Pare AnnOncol.2019 PMID.30165419	0.52	<0.001	0.45	<0.001
NK.ImmuneProfiles.Mouse.Human Shay PNAS.2013 PMID.23382184	0.39	<0.001	0.40	<0.001
IFNa.Module10 Gatza ProcNatlAcadSciUSA.2010 PMID.20335537	0.44	<0.001	0.39	<0.001
Mast.cells.Resting CIBERSORT NatMethods.2015 PMID.25822800	0.38	<0.001	0.39	<0.001
Mast.cell Charoentong CellRep.2017 PMID.28052254	0.42	<0.001	0.38	<0.001
TLS.High.In.No.Response Helmink Nature.2020 PMID.31942075	-0.37	<0.001	-0.26	<0.001
Macrophages.M2 Ghassabeh Blood.2006 PMID.16556895	0.43	<0.001	0.40	<0.001
Neutrophils CIBERSORT NatMethods.2015 PMID.25822800	0.41	<0.001	0.39	<0.001
Granulocytes.ImmuneProfiles.Mouse.Human Shay PNAS.2013 PMID.23382184	0.48	<0.001	0.53	<0.001
Influenza.11genes Khatri Immunity.2015 PMID.26682989	0.43	<0.001	0.37	<0.001
MHC.24genes Forero CancerImmunolRes.2016 PMID.26980599	0.36	<0.001	0.35	<0.001
IFN.Pathway ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715	0.42	<0.001	0.34	<0.001
Bcells.Extended Garber CellMolGastroenterolHepatol.2017 PMID.28508029	0.39	<0.001	0.34	<0.001
Mast.cells.Activated CIBERSORT NatMethods.2015 PMID.25822800	0.35	<0.001	0.37	<0.001
Macrophages Bindea Immunity.2013 PMID.24138885	0.47	<0.001	0.48	<0.001
MDSC.Tumor.Macrophages Schlecker JImmunol.2012 PMID.23152559	0.37	<0.001	0.37	<0.001
Monocytes Charoentong CellRep.2017 PMID.28052254	0.29	<0.001	0.30	0.001

Tcells.CD4.Effector.Memory Charoentong CellRep.2017 PMID.28052254	0.41	<0.001	0.36	<0.001
Neutrophils.Activated.Lung Janiszewska NatCellBiol.2019 PMID.31263265	0.33	<0.001	0.40	<0.001
Tcells.Central.Memory Bindea Immunity.2013 PMID.24138885	0.29	<0.001	0.26	0.003
Tcells.Follicular.Helper Bindea Immunity.2013 PMID.24138885	0.34	<0.001	0.36	<0.001
Tcells.Follicular.Helper TCGA Immunity.2018 PMID.29628290	0.34	<0.001	0.36	<0.001
Neutrophils.Activated.Blood Janiszewska NatCellBiol.2019 PMID.31263265	0.33	<0.001	0.28	0.002
Neutrophils ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715	0.38	<0.001	0.38	<0.001
Bcells.Naive Dybaer JCO.2015 PMID.25800755	0.28	<0.001	0.23	0.008
Tcells.CD4.Central.Memory Charoentong CellRep.2017 PMID.28052254	0.25	<0.001	0.32	<0.001
Tcells.CD8.Exhausted.vs.AntiPDL1.2 Pauken Science.2016 PMID.27789795	0.29	0.001	0.23	0.008
NK.MCP Helmink Nature.2020 PMID.31942077	0.21	0.001	0.13	0.14
TGFB.score TCGA Immunity.2018 PMID.29628290	-0.22	0.001	-0.10	0.25
Tcells.CD8 Bindea Immunity.2013 PMID.24138885	0.24	0.001	0.19	0.03
Tcells.Follicular.Helper Charoentong CellRep.2017 PMID.28052254	0.27	0.001	0.31	<0.001
Bcells.IL10.Minus Lin JImmunol.2014 PMID.25080484	0.34	0.002	0.28	0.001
Immune.IFN TCGA.BRCA.1198 JCI.2020 PMID.32573490	0.28	0.002	0.23	0.01
IFN.Cluster Fan BMCMedGenomics.2011 PMID.21214954	0.27	0.003	0.24	0.007
NK.CD56bright Bindea Immunity.2013 PMID.24138885	0.26	0.003	0.21	0.02
NK.Tcell Charoentong CellRep.2017 PMID.28052254	0.36	0.003	0.37	<0.001
IFN.3.ImmLandscape Wolf PlosOne.2014 PMID.24516633	0.27	0.004	0.25	0.004
IFN.Score.module3 TCGA Immunity.2018 PMID.29628290	0.27	0.004	0.25	0.004
MDSC.Tumor Schlecker JImmunol.2012 PMID.23152559	0.33	0.004	0.30	0.001
Tcells.Regulatory.cell.2gene Petitprez Nature.2020 PMID.31942077	0.31	0.007	0.34	<0.001
Immunosuppression Petitprez Nature.2020 PMID.31942077	-0.23	0.009	-0.14	0.13
Bcells.Memory Dybaer JCO.2015 PMID.25800755	0.23	0.01	0.20	0.02
Tcells.Th2 Charoentong CellRep.2017 PMID.28052254	0.21	0.01	0.22	0.01
Tcells.CD8.Exhausted.vs.Naive.2 Pauken Science.2016 PMID.27789795	0.22	0.01	0.17	0.05

NK Charoentong CellRep.2017 PMID.28052254	0.25	0.01	0.24	0.006
Bcells.Memory Charoentong CellRep.2017 PMID.28052254	0.22	0.02	0.16	0.08
Neutrophils Bindea Immunity.2013 PMID.24138885	0.24	0.03	0.24	0.006
IFN Rody BreastCancerResearch.2008 PMID.19272155	0.21	0.03	0.21	0.02
Bcells.Centroblast Dybaer JCO.2015 PMID.25800755	0.19	0.03	0.12	0.20
Tcells.Effector.Memory Bindea Immunity.2013 PMID.24138885	0.14	0.03	0.22	0.01
Hematopoietic.Stem.cells.ImmuneProfiles.Mouse.Human Shay PNAS.2013 PMID.23382184	-0.14	0.04	-0.17	0.06
Proliferation.Pathway ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715	0.2	0.04	0.11	0.22
CD103.Negative Broz CancerCell.2014 PMID.25446897	0.2	0.04	0.21	0.02
Tcells.CD8.Effector.vs.Naive.2 Pauken Science.2016 PMID.27789795	0.19	0.04	0.09	0.32

Only the immune signatures significantly associated with TILs as continuous variables in each study are shown. Spearman's correlation coefficients and p-values (95% CI) are included. P-values are adjusted for multiple testing using a Benjamini & Hochberg method to control the False Discovery Rate.

eTable 4. Association of Tumor-Infiltrating Lymphocytes (TILs) and Immune Gene Expression Signatures (iGES) With Pathologic Complete Response (pCR) in the Combined CALGB 40601 and PAMELA Data Set

All Signatures	OR	Lower CI	Upper CI	p value	AIC
Bcells.Plasma.cells.52genes Miller GenomeBiol.2013 PMID.23618380	1.93	1.51	2.51	<0.001	453.15
Ig TCGA.BRCA.1198 Cell.2015 PMID.26451490	1.94	1.51	2.51	<0.001	453.11
Plasma.cells ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715	2.01	1.57	2.63	<0.001	450.06
IgG Rody BreastCancerResearch.2008 PMID.19272155	1.81	1.42	2.33	<0.001	458.11
Immune1 TCGA.BRCA.1198 JCI.2020 PMID.32573490	1.77	1.40	2.27	<0.001	459.16
IGG.Cluster Fan BMCMedGenomics.2011 PMID.21214954	1.64	1.30	2.09	0.001	464.74
NK.CD56dim Bindea Immunity.2013 PMID.24138885	1.65	1.31	2.12	0.001	464.57
Bcells.Plasma.cells.Metagene Miller GenomeBiol.2013 PMID.23618380	1.65	1.30	2.11	0.001	464.76
TLS.High.In.Response.MCP Helmink Nature.2020 PMID.31942075	1.64	1.30	2.10	0.001	465.05
Immune.CTLA4.CXCL.FOXP3 TCGA.BRCA.1198 JCI.2020 PMID.32573490.	1.63	1.28	2.10	0.002	466.12
CD274.Single.Gene Hollern Cell.2019 PMID.31730857	1.55	1.23	1.98	0.005	468.41
Bcells.Centroblast Dybkae JCO.2015 PMID.25800755	1.55	1.23	1.98	0.005	468.37
Denditic.cells.ImmuneProfiles.Mouse.Human Shay PNAS.2013 PMID.23382184	1.48	1.18	1.88	0.02	471.30
TILs 40	2.29	1.40	3.77	0.02	471.68
TILs	1.01	1.01	1.02	0.02	472.23
Macrophages.M1 CIBERSORT NatMethods.2015 PMID.25822800	1.47	1.16	1.86	0.02	472.10
STAT1 Rody BreastCancerResearch.2008 PMID.19272155	1.46	1.16	1.86	0.02	472.11
IFN.5.ImmLandscape Wolf PlosOne.2014 PMID.24516633	1.44	1.15	1.83	0.02	472.63
Bcells.Plasmablast Dybaer JCO.2015 PMID.25800755	1.43	1.14	1.80	0.02	472.66
Tcells.CD4.Memory.Activated CIBERSORT NatMethods.2015 PMID.25822800	1.44	1.14	1.82	0.02	472.81
Stromal.Inflammation Heng JPathol.2017 PMID.27861902	1.43	1.14	1.80	0.03	473.18
Bcells.Cluster Iglesia CCR.2014 PMID.24916698	1.40	1.12	1.77	0.03	473.77

Dendritic.cells.Activated Bindea Immunity.2013 PMID.24138885	1.41	1.12	1.79	0.03	473.91
Immune.Suppression Kardos JCIInsight.2016 PMID.27699256	1.41	1.12	1.79	0.03	474.03
Proliferation.Pathway ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715	1.41	1.12	1.78	0.03	473.78
Tcells.CD8.Effector.vs.Naive.2 Pauken Science.2016 PMID.27789795	1.40	1.12	1.78	0.03	473.84
Tcells.CD8.Exhausted.vs.Naive.2 Pauken Science.2016 PMID.27789795	1.40	1.12	1.78	0.03	473.88
MDSC Charoentong CellRep.2017 PMID.28052254	1.41	1.12	1.79	0.03	474.17
Plasma.cells CIBERSORT NatMethods.2015 PMID.25822800	1.38	1.11	1.74	0.03	474.31
TLS.12genes.Chemokine Zhu FrontImmunol.2017 PMID.28713385	1.39	1.11	1.76	0.03	474.40
Tcells.CD4.Activated Charoentong CellRep.2017 PMID.28052254	1.39	1.11	1.77	0.03	474.35
TILs 20	1.86	1.20	2.91	0.04	474.98
Immune.Active Hollern Cell.2019 PMID.31730857	1.37	1.09	1.73	0.04	475.04
Dendritic.cells.Activated CIBERSORT NatMethods.2015 PMID.25822800	1.37	1.09	1.74	0.04	475.31
PDCD1.Single.Gene Pare AnnOncol.2019 PMID.30165419	1.39	1.10	1.78	0.04	475.19
Cytotoxic.Lymphocytes.MCP Petitprez Nature.2020 PMID.31942077	1.37	1.09	1.73	0.04	475.18
Tcells.Activation Petitprez Nature.2020 PMID.31942077	1.38	1.09	1.77	0.04	475.16
MHC.I.CoreGenes Lauss NatCommun.2017 PMID29170503	1.36	1.08	1.71	0.04	475.56
MERCK.Immune.Signature Cristescu Science.2018 PMID.30309915	1.36	1.09	1.73	0.04	475.44
Tcells.CD8.Exhausted.vs.AntiPDL1.2 Pauken Science.2016 PMID.27789795	1.35	1.08	1.70	0.05	475.70
Tcells.Cluster Iglesia CCR.2014 PMID.24916698	1.35	1.08	1.70	0.05	475.80
Tcells.Th1.cells Bindea Immunity.2013 PMID.24138885	1.34	1.07	1.68	0.06	476.16
Tcells.CD8.Memory.vs.Naive.Metagene.3 Pauken Science.2016 PMID.27789795	1.34	1.07	1.70	0.06	476.18
Monocytes Charoentong CellRep.2017 PMID.28052254	1.34	1.07	1.68	0.06	476.30
Tcells.Central.Memory Bindea Immunity.2013 PMID.24138885	1.32	1.06	1.66	0.07	476.47
Tcells.Th17.cells Charoentong CellRep.2017 PMID.28052254	1.32	1.06	1.66	0.07	476.47
Immune.CD19 TCGA.BRCA.1198 JCI.2020 PMID.32573490	1.32	1.06	1.66	0.07	476.68
Tcells.Follicular.Helper Bindea Immunity.2013 PMID.24138885	1.33	1.06	1.68	0.07	476.67

Tcells.Follicular.Helper TCGA Immunity.2018 PMID.29628290	1.33	1.06	1.68	0.07	476.67
TLS.High.In.No.Response Helmink Nature.2020 PMID.31942075	0.76	0.61	0.95	0.07	476.90
Mast.cells Bindea Immunity.2013 PMID.24138885	0.77	0.61	0.95	0.08	476.97
Macrophages.M0 CIBERSORT NatMethods.2015 PMID.25822800	1.31	1.05	1.64	0.08	477.07
MHC.11genes Forero CancerImmunolRes.2016 PMID.26980599	1.30	1.04	1.63	0.08	477.42
NK.Activated CIBERSORT NatMethods.2015 PMID.25822800	1.30	1.04	1.63	0.08	477.42
CTLA4.Single.Gene Hollern Cell.2019 PMID.31730857	1.32	1.04	1.69	0.08	477.31
Tcells.CD8 CIBERSORT NatMethods.2015 PMID.25822800	1.30	1.04	1.63	0.08	477.45
Tcells.Follicular.Helper CIBERSORT NatMethods.2015 PMID.25822800	1.30	1.04	1.64	0.08	477.44
CTLA4.Pathway GSEA.BIOCARTA ProcNatlAcadSciUSA.2005 PMID.16199517	1.31	1.04	1.65	0.08	477.17
Immune.87 Perez JCO.2015 PMID.2560586	1.30	1.04	1.64	0.08	477.24
Tcells.CD8.Activated Charoentong CellRep.2017 PMID.28052254	1.30	1.04	1.64	0.08	477.34
Tcells.MCP Petitprez Nature.2020 PMID.31942077	1.30	1.04	1.65	0.08	477.38
Immune.CD8.GZMK TCGA.BRCA.1198 JCI.2020 PMID.32573490	1.30	1.04	1.63	0.08	477.33
Tcells.Effector.Memory Bindea Immunity.2013 PMID.24138885	0.78	0.62	0.97	0.08	477.50
CD8.Cluster Iglesia CCR.2014 PMID.24916698	1.29	1.03	1.62	0.09	477.64
Bcells.Centrocyte Dybkaer JCO.2015 PMID.25800755	1.28	1.02	1.61	0.10	478.00
Bcells.Memory CIBERSORT NatMethods.2015 PMID.25822800	1.27	1.02	1.60	0.10	478.03
Bcells.Activated Charoentong CellRep.2017 PMID.28052254	1.28	1.02	1.60	0.10	477.98
Plasmacytoid.Dendritic.cell Charoentong CellRep.2017 PMID.28052254	0.78	0.62	0.98	0.10	477.92
MDSC.Tumor.Macrophages Schlecker JImmunol.2012 PMID.23152559	1.29	1.02	1.63	0.10	478.03
Cytotoxic.cells Bindea Immunity.2013 PMID.24138885	1.28	1.02	1.60	0.10	477.99
Tcells.CD8.Central.Memory Charoentong CellRep.2017 PMID.28052254	0.79	0.63	0.98	0.10	478.03
Tcells.Th2 Charoentong CellRep.2017 PMID.28052254	1.27	1.02	1.60	0.10	478.03
TLS.Tumors.w.TLS.and.CD8.vs.CD8.alone Cabrita Nature.2020 PMID.31942071	1.27	1.02	1.60	0.10	478.03

MDSC.Granulocytic Youn LeukocBiol.2012 PMID.21954284	1.27	1.02	1.60	0.10	478.07
Tcells.Gamma.Delta CIBERSORT NatMethods.2015 PMID.25822800	1.27	1.02	1.59	0.10	478.15
MHC.II Rody BreastCancerResearch.2008 PMID.19272155	1.27	1.02	1.60	0.10	478.20
Immune.CD34.TIE1 TCGA.BRCA.1198 JCI.2020 PMID.32573490	0.80	0.64	0.99	0.11	478.37
Tcells.Survival.2gene Petitprez Nature.2020 PMID.31942077	1.27	1.01	1.60	0.11	478.36
Tcells.NK.51genes Miller GenomeBiol.2013 PMID.23618380	1.26	1.01	1.58	0.11	478.44
Bcells ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715	1.26	1.01	1.58	0.11	478.48
PD1.Signaling.Reactome GSEA ProcNatlAcadSciUSA.2005 PMID.16199517	1.26	1.01	1.59	0.11	478.51
Tcells.Bcells.Lymphocyte.Infiltration Calabro BreastCancerResTreat.2009 PMID.18592372	1.25	1.01	1.57	0.12	478.59
Lymphocyte.Infiltration.Expression.Score TCGA Immunity.2018 PMID.29628290	1.25	1.01	1.57	0.12	478.59
Bcells.Memory Charoentong CellRep.2017 PMID.28052254	1.25	1.00	1.57	0.12	478.66
Macrophages Charoentong CellRep.2017 PMID.28052254	0.80	0.64	0.99	0.12	478.58
NK.CD56bright Bindea Immunity.2013 PMID.24138885	1.25	1.00	1.57	0.12	478.64
MHC.I Rody BreastCancerResearch.2008 PMID.19272155	1.26	1.00	1.58	0.12	478.75
Tcells.CD8.Effector.Memory Charoentong CellRep.2017 PMID.28052254	1.25	1.00	1.57	0.12	478.75
NK.Resting CIBERSORT NatMethods.2015 PMID.25822800	1.25	1.00	1.57	0.12	478.79
TILs 60	1.73	0.99	3.04	0.12	478.89
Bcells.Tcells.Cooperation Hollern Cell.2019 PMID.31730857	1.24	1.00	1.55	0.12	478.86
MCD3.CD8 Fan BMCMedGenomics.2011 PMID.21214954	1.24	1.00	1.56	0.12	478.89
Tcells.CD8.Memory.vs.Naive.Metagene.2 Pauken Science.2016 PMID.27789795	1.24	1.00	1.56	0.12	478.88
Tcells.Resident.Memory.Single.cell Savas NatMed.2018 PMID.29942092	1.25	1.00	1.57	0.12	478.91
NK.CD56dim Charoentong CellRep.2017 PMID.28052254	1.23	0.99	1.54	0.13	479.07
NK Charoentong CellRep.2017 PMID.28052254	0.81	0.65	1.01	0.13	479.13
Tcells.Th2.cells Bindea Immunity.2013 PMID.24138885	1.23	0.99	1.54	0.13	479.12

Bcells.ImmuneProfiles.Mouse.Human Shay PNAS.2013 PMID.23382184	1.23	0.98	1.53	0.14	479.29
Bcells.Immature Charoentong CellRep.2017 PMID.28052254	1.23	0.98	1.53	0.14	479.32
Immune.HLA.A.F TCGA.BRCA.1198 JCI.2020 PMID.32573490	1.23	0.98	1.55	0.14	479.28
Bcells.Memory Dybaer JCO.2015 PMID.25800755	1.23	0.98	1.54	0.14	479.31
Macrophages.Th1.Cluster Iglesia CCR.2014 PMID.24916698	1.23	0.98	1.54	0.15	479.37
Immune.CD4.CD53.CD84.BTK TCGA.BRCA.1198 JCI.2020 PMID.32573490	1.22	0.98	1.54	0.15	479.42
Immune.Hot.vs.Cold.CD8 Cabrita Nature.2020 PMID.31942071	1.22	0.98	1.54	0.15	479.45
LCK Rody BreastCancerResearch.2008 PMID.19272155	1.22	0.98	1.53	0.15	479.50
Tcells.CD8.Exhausted.vs.Naive.Metagene.1 Pauken Science.2016 PMID.27789795	1.22	0.98	1.54	0.15	479.48
Tcells.Bcell.Cluster Fan BMCMedGenomics.2011 PMID.21214954	1.22	0.98	1.54	0.16	479.55
Tcells Bindea Immunity.2013 PMID.24138885	1.22	0.98	1.54	0.16	479.56
Bcells.Naive CIBERSORT NatMethods.2015 PMID.25822800	1.21	0.98	1.52	0.16	479.61
Tcells.Gamma.Delta Bindea Immunity.2013 PMID.24138885	1.21	0.98	1.51	0.16	479.63
Tcells.Gamma.Delta TCGA Immunity.2018 PMID.29628290	1.21	0.98	1.51	0.16	479.63
Tcells ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715	1.21	0.97	1.52	0.16	479.68
Tcells.CD8.Exhausted.at.day.8.post.Imm.vs.Naive.Metagene.1 Pauken Science.2016 PMID.27789795	1.22	0.97	1.53	0.16	479.71
Bcells Bindea Immunity.2013 PMID.24138885	1.20	0.96	1.50	0.19	479.95
Tcells.NK.Metagene Miller GenomeBiol.2013 PMID.23618380	1.20	0.96	1.50	0.20	480.03
Macrophages.Monocytes.CSF1.Response Beck CCR.2009 PMID..19188147	1.20	0.96	1.50	0.20	480.09
CSF1.Response TCGA Immunity.2018 PMID.29628290	1.20	0.96	1.50	0.20	480.09
Neutrophils.Activated.Lung Janiszewska NatCellBiol.2019 PMID.31263265	1.20	0.96	1.51	0.20	480.05
Tcells.CD4.Memory.Resting CIBERSORT NatMethods.2015 PMID.25822800	1.20	0.96	1.50	0.20	480.08
Tcells.Th1.cells Charoentong CellRep.2017 PMID.28052254	1.20	0.96	1.50	0.20	480.10
NK ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715	1.19	0.96	1.49	0.20	480.17

Tcells.CD8.Exhausted.vs.Naive.Metagene.3 Pauken Science.2016 PMID.27789795	1.20	0.96	1.50	0.20	480.17
Tcells.CD8.MCP Petitprez Nature.2020 PMID.31942077	1.20	0.96	1.51	0.20	480.19
Tcells.Regulatory.Tregs CIBERSORT NatMethods.2015 PMID.25822800	1.19	0.95	1.49	0.20	480.21
Tcells.CD4.Naive CIBERSORT NatMethods.2015 PMID.25822800	1.19	0.95	1.49	0.22	480.31
Neutrophils ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715	1.19	0.95	1.51	0.22	480.32
Dendritic.cells.Immature. Bindea Immunity.2013 PMID.24138885	1.18	0.95	1.48	0.22	480.38
MDSC.Neutrophil Youn LeukocBiol.2012 PMID.21954284	1.19	0.95	1.49	0.22	480.38
Macrophages ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715	1.18	0.95	1.48	0.22	480.42
Immune.Cell.Content Verhaak NatCommun.2013 PMID.24113773	1.18	0.95	1.48	0.22	480.43
IFNg.Module11 Gatza ProcNatlAcadSciUSA.2010 PMID.20335537	1.18	0.95	1.48	0.23	480.47
Influenza.11genes Khatri Immunity.2015 PMID.26682989	1.18	0.95	1.47	0.23	480.47
Bcells.IL10.Plus Lin JImmunol.2014 PMID.25080484	1.18	0.94	1.48	0.23	480.49
TLS.Known.Markers Cabrita Nature.2020 PMID.31942071	1.17	0.94	1.47	0.24	480.56
Neutrophils.Activated.Blood Janiszewska NatCellBiol.2019 PMID.31263265	0.85	0.67	1.06	0.24	480.57
TLS.Hallmark Cabrita Nature.2020 PMID.31942071	1.17	0.94	1.47	0.24	480.61
Monocytes CIBERSORT NatMethods.2015 PMID.25822800	1.17	0.94	1.46	0.24	480.62
Dendritic.cells.Resting CIBERSORT NatMethods.2015 PMID.25822800	1.16	0.94	1.45	0.26	480.75
Tcells.Regulatory Charoentong CellRep.2017 PMID.28052254	1.17	0.93	1.46	0.26	480.77
Immune.HLA.D TCGA.BRCA.1198 JCI.2020 PMID.32573490	1.17	0.93	1.46	0.26	480.78
Monocytes..Dendritic.cell.Metagene Miller GenomeBiol.2013 PMID.23618380	1.17	0.93	1.46	0.26	480.80
Tcells.CD8.Memory.vs.Naive.1 Pauken Science.2016 PMID.27789795	1.17	0.93	1.47	0.26	480.81
Tcells.CD8.Memory.vs.Naive.Metagene.1 Pauken Science.2016 PMID.27789795	1.17	0.93	1.47	0.26	480.81
Cytolytic.Activity Rooney Cell.2015 PMID.25594174	1.16	0.93	1.46	0.27	480.87
Monocytes.Dendritic.25genes Miller GenomeBiol.2013 PMID.23618380	1.15	0.92	1.44	0.32	481.11

IFN.Cluster.GSEA.GP11 Fan BMCMedGenomics.2011 PMID.21214954	1.15	0.92	1.43	0.32	481.14
Tcells.CD8 Bindea Immunity.2013 PMID.24138885	0.87	0.70	1.09	0.32	481.14
Neutrophils Bindea Immunity.2013 PMID.24138885	0.88	0.70	1.09	0.34	481.25
Tcells.CD4.Central.Memory Charoentong CellRep.2017 PMID.28052254	0.88	0.71	1.09	0.35	481.29
Neutrophils CIBERSORT NatMethods.2015 PMID.25822800	1.13	0.91	1.42	0.35	481.33
Dendritic.cells Bindea Immunity.2013 PMID.24138885	1.13	0.91	1.42	0.36	481.35
Bcells.IL10.Minus Lin JImmunol.2014 PMID.25080484	1.13	0.91	1.41	0.39	481.46
Serum.Response.Up TCGA Immunity.2018 PMID.29628290	1.13	0.90	1.41	0.40	481.54
Bcells Garber CellMolGastroenterolHepatol.2017 PMID.28508029	1.12	0.90	1.39	0.41	481.57
NK.MCP Helmink Nature.2020 PMID.31942077	1.12	0.90	1.39	0.41	481.60
Tcells.Bcell.KEGG.hematopoietic.cell.lineage GSEA.GP2 ProcNatlAcadSciUSA.2005 PMID.16199517	1.12	0.90	1.40	0.41	481.59
Macrophages.M2 CIBERSORT NatMethods.2015 PMID.25822800	1.12	0.90	1.40	0.42	481.62
Tcells.CD4.Effector.Memory Charoentong CellRep.2017 PMID.28052254	0.90	0.72	1.12	0.43	481.66
IFNa.Module10 Gatza ProcNatlAcadSciUSA.2010 PMID.20335537	1.12	0.90	1.39	0.43	481.67
Wound.Healing Chang PlosBiol.2004 PMID.14737219	1.11	0.89	1.39	0.44	481.72
Macrophages Bindea Immunity.2013 PMID.24138885	1.11	0.89	1.39	0.44	481.72
Granulocytes.ImmuneProfiles.Mouse.Human Shay PNAS.2013 PMID.23382184	1.11	0.89	1.40	0.46	481.77
MDSC.Tumor Schlecker JImmunol.2012 PMID.23152559	1.11	0.89	1.39	0.46	481.80
Tcells.ImmuneProfiles.Mouse.Human Shay PNAS.2013 PMID.23382184	1.10	0.89	1.37	0.48	481.84
Tcells.CD8.Exhausted.Anti.PDL1.vs.Control.Metagene.1 Pauken Science.2016 PMID.27789795	1.10	0.89	1.38	0.48	481.86
Tcells.Thelper Bindea Immunity.2013 PMID.24138885	1.10	0.88	1.37	0.49	481.88
HCK Rody BreastCancerResearch.2008 PMID.19272155	1.10	0.88	1.38	0.49	481.90
NK.ImmuneProfiles.Mouse.Human Shay PNAS.2013 PMID.23382184	1.10	0.88	1.36	0.50	481.93

Bcells.Extended Garber CellMolGastroenterolHepatol.2017 PMID.28508029	0.91	0.73	1.14	0.50	481.94
Dendritic.cells.Activated Charoentong CellRep.2017 PMID.28052254	1.09	0.88	1.37	0.52	481.98
Mast.cells.Resting CIBERSORT NatMethods.2015 PMID.25822800	1.08	0.87	1.35	0.57	482.10
Mast.cell Charoentong CellRep.2017 PMID.28052254	0.93	0.74	1.15	0.58	482.13
Tcells.Th17.cells Bindea Immunity.2013 PMID.24138885	0.93	0.75	1.15	0.61	482.19
Immune.14 Perez JCO.2015 PMID.2560586	1.07	0.86	1.33	0.65	482.27
IFN Rody BreastCancerResearch.2008 PMID.19272155	0.94	0.75	1.16	0.65	482.26
MHC.24genes Forero CancerImmunolRes.2016 PMID.26980599	0.94	0.75	1.17	0.65	482.27
Macrophages.ImmuneProfiles.Mouse.Human Shay PNAS.2013 PMID.23382184	1.06	0.85	1.33	0.68	482.32
Immunosuppression Petitprez Nature.2020 PMID.31942077	0.95	0.76	1.18	0.71	482.37
Hematopoietic.Stem.cells.ImmuneProfiles.Mouse.Human Shay PNAS.2013 PMID.23382184	1.06	0.85	1.32	0.71	482.37
Neutrophils Charoentong CellRep.2017 PMID.28052254	0.95	0.75	1.18	0.71	482.37
Tcells.Follicular.Helper Charoentong CellRep.2017 PMID.28052254	1.06	0.85	1.32	0.71	482.36
Eosinophils Charoentong CellRep.2017 PMID.28052254	1.06	0.85	1.32	0.71	482.38
Tcells.Gamma.Delta Charoentong CellRep.2017 PMID.28052254	1.05	0.85	1.31	0.71	482.39
NK Bindea Immunity.2013 PMID.24138885	0.95	0.77	1.18	0.73	482.41
Tcells.Regulatory.cell.2gene Petitprez Nature.2020 PMID.31942077	0.95	0.76	1.19	0.73	482.41
Immune.GIMAP.IL16 TCGA.BRCA.1198 JCI.2020 PMID.32573490	1.05	0.84	1.31	0.73	482.42
NK.CD56bright Charoentong CellRep.2017 PMID.28052254	1.05	0.84	1.31	0.76	482.46
Bcells.Naive Dybaer JCO.2015 PMID.25800755	0.97	0.78	1.20	0.83	482.52
IFN.Pathway ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715	1.03	0.83	1.29	0.83	482.53
Immune.FOS.JUN.IL6 TCGA.BRCA.1198 JCI.2020 PMID.32573490	0.97	0.77	1.21	0.83	482.53
Macrophages.M2 Ghassabeh Blood.2006 PMID.16556895	1.03	0.83	1.29	0.83	482.52
Monocytes ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715	1.03	0.83	1.30	0.83	482.53

IFN.3.ImmLandscape Wolf PlosOne.2014 PMID.24516633	0.97	0.78	1.21	0.87	482.56
IFN.Score.module3 TCGA Immunity.2018 PMID.29628290	0.97	0.78	1.21	0.87	482.56
NK.Tcell Charoentong CellRep.2017 PMID.28052254	1.03	0.82	1.28	0.87	482.57
Dendritic.cells.Immature. Charoentong CellRep.2017 PMID.28052254	1.02	0.82	1.27	0.88	482.58
IFN.Cluster Fan BMCMedGenomics.2011 PMID.21214954	0.98	0.79	1.21	0.88	482.58
Mast.cells.Activated CIBERSORT NatMethods.2015 PMID.25822800	1.02	0.82	1.27	0.88	482.57
Immune.IFN TCGA.BRCA.1198 JCI.2020 PMID.32573490	0.98	0.79	1.22	0.88	482.58
Eosinophils Bindea Immunity.2013 PMID.24138885	1.02	0.82	1.27	0.90	482.59
CD103.Negative Broz CancerCell.2014 PMID.25446897	1.01	0.81	1.26	0.95	482.61
CD68.Cluster Iglesia CCR.2014 PMID.24916698	0.99	0.80	1.23	0.96	482.61
Neutrophils.MCP Petitprez Nature.2020 PMID.31942077	0.99	0.80	1.24	0.97	482.61
TLS.9genes Cabrita Nature.2020 PMID.31942071	1.00	0.81	1.25	0.98	482.62
TGFB.score TCGA Immunity.2018 PMID.29628290	1.00	0.81	1.25	0.99	482.62
Eosinophils CIBERSORT NatMethods.2015 PMID.25822800	1.00	0.81	1.24	0.99	482.62

Logistic regression multivariable models adjusted by study and treatment arm has been built for each biomarker. P-values are adjusted for multiple testing using a Benjamini & Hochberg method to control the False Discovery Rate.

eTable 5. Association of Tumor-Infiltrating Lymphocytes (TILs) and Immune Gene Expression Signatures (iGES) With Pathologic Complete Response (pCR) in the Presence of Clinical Parameters Using the Combined CALGB 40601 and PAMELA Cohort

Signatures	OR	Lower CI	Upper CI	p value	AIC
Bcells.Plasma.cells.52genes Miller GenomeBiol.2013 PMID.23618380	1.82	1.39	2.40	0.002	429.72
Ig TCGA.BRCA.1198 Cell.2015 PMID.26451490	1.80	1.38	2.37	0.002	420.23
Plasma.cells ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715	1.82	1.40	2.42	0.002	429.49
IgG Rody BreastCancerResearch.2008 PMID.19272155	1.67	1.29	2.19	0.005	434.08
Immune1 TCGA.BRCA.1198 JCI.2020 PMID.32573490	1.66	1.29	2.17	0.005	434.23
IGG.Cluster Fan BMCMedGenomics.2011 PMID.21214954	1.55	1.21	2.01	0.02	438.13
NK.CD56dim Bindea Immunity.2013 PMID.24138885	1.53	1.18	2.00	0.03	439.31
Bcells.Plasma.cells.Metagene Miller GenomeBiol.2013 PMID.23618380	1.54	1.20	2.01	0.03	438.43
TLS.High.In.Response.MCP Helmink Nature.2020 PMID.31942075	1.57	1.22	2.05	0.02	437.57
TILs	1.01	1.00	1.02	0.18	444.48

Logistic regression multivariable models are adjusted by study, treatment arm, clinical stage, age, HR-status, menopausal status, and subtype.
Only the iGES significantly associated with pCR and TILs are shown.
P-values are adjusted for multiple testing using a Benjamini & Hochberg method to control the False Discovery Rate.

eTable 6. Accuracy Metrics (Area Under the Curve From the Receiver Operating Characteristic Curves: AUC ROC) of the Univariable Immune-Biomarker Models to Predict Pathologic Complete Response (pCR)

Signature	AUC CALGB 40601	AUC PAMELA
Ig TCGA.BRCA.1198 Cell.2015 PMID.26451490	0.64	0.65
Immune.CTLA4.CXCL.FOXP3 TCGA.BRCA.1198 JCI.2020 PMID.32573490.	0.60	0.64
Bcells.Plasma.cells.52genes Miller GenomeBiol.2013 PMID.23618380	0.63	0.64
IgG Rody BreastCancerResearch.2008 PMID.19272155	0.62	0.64
Plasma.cells ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715	0.66	0.63
Immune1 TCGA.BRCA.1198 JCI.2020 PMID.32573490	0.62	0.62
IGG.Cluster Fan BMCMedGenomics.2011 PMID.21214954	0.60	0.62
Bcells.Plasmablast Dybaer JCO.2015 PMID.25800755	0.62	0.59
TILs	0.60	0.57
Monocytes Charoentong CellRep.2017 PMID.28052254	0.62	0.56
Denditic.cells.ImmuneProfiles.Mouse.Human Shay PNAS.2013 PMID.23382184	0.62	0.56
MDSC.Granulocytic Youn LeukocBiol.2012 PMID.21954284	0.61	0.53
TILs 40	0.60	0.59
TLS.High.In.Response.MCP Helmink Nature.2020 PMID.31942075	0.60	0.63
IFN.5.ImmLandscape Wolf PlosOne.2014 PMID.24516633	0.59	0.60
Tcells.CD8.Exhausted.vs.AntiPDL1.2 Pauken Science.2016 PMID.27789795	0.59	0.53
Plasma.cells CIBERSORT NatMethods.2015 PMID.25822800	0.59	0.55
MDSC.Tumor.Macrophages Schlecker JImmunol.2012 PMID.23152559	0.59	0.61
MHC.11genes Forero CancerImmunolRes.2016 PMID.26980599	0.59	0.58
PD1.Signaling.Reactome GSEA ProcNatlAcadSciUSA.2005 PMID.16199517	0.59	0.56
TLS.High.In.No.Response Helmink Nature.2020 PMID.31942075	0.58	0.55
TILs 20	0.58	0.55
Bcells.Centrocyte Dybkaer JCO.2015 PMID.25800755	0.58	0.52
Bcells.Plasma.cells.Metagene Miller GenomeBiol.2013 PMID.23618380	0.58	0.63
Tcells.CD8.Exhausted.at.day.8.post.Imm.vs.Naive.Metagene.1 Pauken Science.2016 PMID.27789795	0.58	0.56
Tcells.CD4.Activated Charoentong CellRep.2017 PMID.28052254	0.58	0.54
Bcells.Centroblast Dybkae JCO.2015 PMID.25800755	0.58	0.63
Macrophages.M0 CIBERSORT NatMethods.2015 PMID.25822800	0.58	0.60
NK.CD56dim Bindea Immunity.2013 PMID.24138885	0.58	0.63
Tcells.CD8.Exhausted.vs.Naive.Metagene.3 Pauken Science.2016 PMID.27789795	0.57	0.57

Tcells.CD4.Memory.Activated CIBERSORT NatMethods.2015 PMID.25822800	0.57	0.58
CD274.Single.Gene Hollern Cell.2019 PMID.31730857	0.57	0.65
Tcells.Th1.cells Bindea Immunity.2013 PMID.24138885	0.57	0.56
Tcells.CD8.Exhausted.vs.Naive.Metagene.1 Pauken Science.2016 PMID.27789795	0.57	0.53
Tcells.Th17.cells Charoentong CellRep.2017 PMID.28052254	0.57	0.53
Tcells.CD8.Memory.vs.Naive.1 Pauken Science.2016 PMID.27789795	0.57	0.55
MHC.II Rody BreastCancerResearch.2008 PMID.19272155	0.57	0.59
MDSC Charoentong CellRep.2017 PMID.28052254	0.57	0.60
PDCD1.Single.Gene Pare AnnOncol.2019 PMID.30165419	0.57	0.61
Tcells.Activation Petitprez Nature.2020 PMID.31942077	0.57	0.62
Tcells.Central.Memory Bindea Immunity.2013 PMID.24138885	0.57	0.59
TLS.12genes.Chemokine Zhu FrontImmunol.2017 PMID.28713385	0.57	0.60
Immune.CD8.GZMK TCGA.BRCA.1198 JCI.2020 PMID.32573490	0.56	0.56
Tcells.Th2 Charoentong CellRep.2017 PMID.28052254	0.56	0.64
TILs 60	0.56	0.55
Neutrophils CIBERSORT NatMethods.2015 PMID.25822800	0.56	0.55
Dendritic.cells.Activated Bindea Immunity.2013 PMID.24138885	0.56	0.60
Bcells.Memory Dybaer JCO.2015 PMID.25800755	0.56	0.58
STAT1 Rody BreastCancerResearch.2008 PMID.19272155	0.56	0.61
LCK Rody BreastCancerResearch.2008 PMID.19272155	0.56	0.56
Tcells.CD8.Effector.vs.Naive.2 Pauken Science.2016 PMID.27789795	0.56	0.58
MERCK.Immune.Signature Cristescu Science.2018 PMID.30309915	0.56	0.60
CTLA4.Single.Gene Hollern Cell.2019 PMID.31730857	0.56	0.59
Tcells.Cluster Iglesia CCR.2014 PMID.24916698	0.56	0.57
Immune.Suppression Kardos JCIInsight.2016 PMID.27699256	0.56	0.61
Tcells.CD8.Memory.vs.Naive.Metagene.3 Pauken Science.2016 PMID.27789795	0.56	0.57
Immune.87 Perez JCO.2015 PMID.2560586	0.56	0.57
Immune.Active Hollern Cell.2019 PMID.31730857	0.56	0.59
Neutrophils.Activated.Blood Janiszewska NatCellBiol.2019 PMID.31263265	0.56	0.50
Tcells.CD8.Central.Memory Charoentong CellRep.2017 PMID.28052254	0.56	0.54
Tcells.CD8.Activated Charoentong CellRep.2017 PMID.28052254	0.56	0.56
TLS.Known.Markers Cabrita Nature.2020 PMID.31942071	0.56	0.53
Tcells.CD8.Exhausted.vs.Naive.2 Pauken Science.2016 PMID.27789795	0.56	0.59
Stromal.Inflammation Heng JPathol.2017 PMID.27861902	0.56	0.60
MHC.I.CoreGenes Lauss NatCommun.2017 PMID29170503	0.56	0.64
Macrophages.M1 CIBERSORT NatMethods.2015 PMID.25822800	0.55	0.61

NK ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715	0.55	0.55
Dendritic.cells.Activated CIBERSORT NatMethods.2015 PMID.25822800	0.55	0.61
CD8.Cluster Iglesia CCR.2014 PMID.24916698	0.55	0.56
Bcells.Extended Garber CellMolGastroenterolHepatol.2017 PMID.28508029	0.55	0.55
NK.Resting CIBERSORT NatMethods.2015 PMID.25822800	0.55	0.56
Bcells.Cluster Iglesia CCR.2014 PMID.24916698	0.55	0.56
Tcells.NK.51genes Miller GenomeBiol.2013 PMID.23618380	0.55	0.58
Tcells.Gamma.Delta CIBERSORT NatMethods.2015 PMID.25822800	0.55	0.56
TLS.Tumors.w.TLS.and.CD8.vs.CD8.alone Cabrita Nature.2020 PMID.31942071	0.55	0.55
Bcells.Activated Charoentong CellRep.2017 PMID.28052254	0.55	0.55
Neutrophils Bindea Immunity.2013 PMID.24138885	0.55	0.53
Hematopoietic.Stem.cells.ImmuneProfiles.Mouse.Human Shay PNAS.2013 PMID.23382184	0.55	0.45
TLS.Hallmark Cabrita Nature.2020 PMID.31942071	0.55	0.51
NK Charoentong CellRep.2017 PMID.28052254	0.55	0.56
Tcells.Th2.cells Bindea Immunity.2013 PMID.24138885	0.55	0.62
Tcells.CD8.Memory.vs.Naive.Metagene.2 Pauken Science.2016 PMID.27789795	0.55	0.59
Immune.GIMAP.IL16 TCGA.BRCA.1198 JCI.2020 PMID.32573490	0.55	0.53
Tcells.Survival.2gene Petitprez Nature.2020 PMID.31942077	0.55	0.57
Tcells.CD4.Naive CIBERSORT NatMethods.2015 PMID.25822800	0.55	0.53
Bcells ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715	0.55	0.55
NK.CD56bright Bindea Immunity.2013 PMID.24138885	0.55	0.59
Bcells.Memory Charoentong CellRep.2017 PMID.28052254	0.55	0.58
Tcells ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715	0.55	0.56
MCD3.CD8 Fan BMCMedGenomics.2011 PMID.21214954	0.55	0.56
Macrophages Charoentong CellRep.2017 PMID.28052254	0.55	0.52
Bcells.Immature Charoentong CellRep.2017 PMID.28052254	0.54	0.55
Proliferation.Pathway ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715	0.54	0.59
Immune.FOS.JUN.IL6 TCGA.BRCA.1198 JCI.2020 PMID.32573490	0.54	0.50
IFN.Score.module3 TCGA Immunity.2018 PMID.29628290	0.54	0.43
TLS.9genes Cabrita Nature.2020 PMID.31942071	0.54	0.52
Dendritic.cells.Activated Charoentong CellRep.2017 PMID.28052254	0.54	0.60
IFN.Cluster Fan BMCMedGenomics.2011 PMID.21214954	0.54	0.44
Immune.IFN TCGA.BRCA.1198 JCI.2020 PMID.32573490	0.54	0.44
Tcells.CD8.Memory.vs.Naive.Metagene.1 Pauken Science.2016 PMID.27789795	0.54	0.55
CD68.Cluster Iglesia CCR.2014 PMID.24916698	0.54	0.47

Tcells.Bcells.Lymphocyte.Infiltration Calabro BreastCancerResTreat.2009 PMID.18592372	0.54	0.57
Tcells.Effector.Memory Bindea Immunity.2013 PMID.24138885	0.54	0.54
CD103.Negative Broz CancerCell.2014 PMID.25446897	0.54	0.54
Bcells Bindea Immunity.2013 PMID.24138885	0.54	0.57
Tcells.Thelper Bindea Immunity.2013 PMID.24138885	0.54	0.51
TGFB.score TCGA Immunity.2018 PMID.29628290	0.54	0.48
Mast.cells.Activated CIBERSORT NatMethods.2015 PMID.25822800	0.54	0.53
Neutrophils Charoentong CellRep.2017 PMID.28052254	0.54	0.44
NK.Tcell Charoentong CellRep.2017 PMID.28052254	0.54	0.51
Lymphocyte.Infiltration.Expression.Score TCGA Immunity.2018 PMID.29628290	0.54	0.57
Eosinophils Bindea Immunity.2013 PMID.24138885	0.54	0.45
IFN.3.ImmLandscape Wolf PlosOne.2014 PMID.24516633	0.54	0.43
NK Bindea Immunity.2013 PMID.24138885	0.54	0.54
Neutrophils.Activated.Lung Janiszewska NatCellBiol.2019 PMID.31263265	0.54	0.51
NK.CD56bright Charoentong CellRep.2017 PMID.28052254	0.54	0.53
Bcells.Naive CIBERSORT NatMethods.2015 PMID.25822800	0.54	0.54
Cytotoxic.cells Bindea Immunity.2013 PMID.24138885	0.54	0.57
Tcells.Bcell.Cluster Fan BMCMedGenomics.2011 PMID.21214954	0.54	0.59
Macrophages.Th1.Cluster Iglesia CCR.2014 PMID.24916698	0.54	0.58
Tcells.CD8.Effector.Memory Charoentong CellRep.2017 PMID.28052254	0.54	0.60
CSF1.Response TCGA Immunity.2018 PMID.29628290	0.54	0.58
Mast.cells Bindea Immunity.2013 PMID.24138885	0.54	0.63
Eosinophils Charoentong CellRep.2017 PMID.28052254	0.54	0.46
Bcells.Naive Dybaer JCO.2015 PMID.25800755	0.54	0.44
Monocytes.Dendritic.25genes Miller GenomeBiol.2013 PMID.23618380	0.54	0.57
Tcells.Follicular.Helper TCGA Immunity.2018 PMID.29628290	0.54	0.62
IFN Rody BreastCancerResearch.2008 PMID.19272155	0.54	0.58
Tcells.Resident.Memory.Single.cell Savas NatMed.2018 PMID.29942092	0.54	0.61
Tcells.Th17.cells Bindea Immunity.2013 PMID.24138885	0.54	0.44
Bcells.IL10.Plus Lin JImmunol.2014 PMID.25080484	0.53	0.58
MDSC.Neutrophil Youn LeukocBiol.2012 PMID.21954284	0.53	0.59
Tcells.Regulatory.Tregs CIBERSORT NatMethods.2015 PMID.25822800	0.53	0.54
Dendritic.cells Bindea Immunity.2013 PMID.24138885	0.53	0.57
Tcells.NK.Metagene Miller GenomeBiol.2013 PMID.23618380	0.53	0.57
Bcells Garber CellMolGastroenterolHepatol.2017 PMID.28508029	0.53	0.52
Bcells.Memory CIBERSORT NatMethods.2015 PMID.25822800	0.53	0.55
Tcells.Follicular.Helper Bindea Immunity.2013 PMID.24138885	0.53	0.62
Tcells.MCP Petitprez Nature.2020 PMID.31942077	0.53	0.58

Immune.HLA.D TCGA.BRCA.1198 JCI.2020 PMID.32573490	0.53	0.59
Tcells.CD4.Effector.Memory Charoentong CellRep.2017 PMID.28052254	0.53	0.57
Immune.Cell.Content Verhaak NatCommun.2013 PMID.24113773	0.53	0.57
Tcells.CD8 CIBERSORT NatMethods.2015 PMID.25822800	0.53	0.57
IFN.Pathway ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715	0.53	0.48
Macrophages.ImmuneProfiles.Mouse.Human Shay PNAS.2013 PMID.23382184	0.53	0.58
NK.Activated CIBERSORT NatMethods.2015 PMID.25822800	0.53	0.58
Tcells.Follicular.Helper CIBERSORT NatMethods.2015 PMID.25822800	0.53	0.57
Serum.Response.Up TCGA Immunity.2018 PMID.29628290	0.53	0.48
Dendritic.cells.Resting CIBERSORT NatMethods.2015 PMID.25822800	0.53	0.61
Eosinophils CIBERSORT NatMethods.2015 PMID.25822800	0.53	0.48
Tcells.Follicular.Helper Charoentong CellRep.2017 PMID.28052254	0.53	0.54
Tcells.CD4.Central.Memory Charoentong CellRep.2017 PMID.28052254	0.53	0.56
Neutrophils.MCP Petitprez Nature.2020 PMID.31942077	0.53	0.52
Tcells.Gamma.Delta Bindea Immunity.2013 PMID.24138885	0.53	0.49
Immunosuppression Petitprez Nature.2020 PMID.31942077	0.53	0.54
Tcells.CD4.Memory.Resting CIBERSORT NatMethods.2015 PMID.25822800	0.53	0.55
Bcells.ImmuneProfiles.Mouse.Human Shay PNAS.2013 PMID.23382184	0.53	0.53
Monocytes..Dendritic.cell.Metagene Miller GenomeBiol.2013 PMID.23618380	0.53	0.59
Immune.CD19 TCGA.BRCA.1198 JCI.2020 PMID.32573490	0.53	0.56
Immune.CD34.TIE1 TCGA.BRCA.1198 JCI.2020 PMID.32573490	0.53	0.60
Tcells.CD8.MCP Petitprez Nature.2020 PMID.31942077	0.53	0.54
Tcells.ImmuneProfiles.Mouse.Human Shay PNAS.2013 PMID.23382184	0.53	0.53
HCK Rody BreastCancerResearch.2008 PMID.19272155	0.53	0.57
CTLA4.Pathway GSEA.BIOCARTA ProcNatlAcadSciUSA.2005 PMID.16199517	0.53	0.59
Tcells.Th1.cells Charoentong CellRep.2017 PMID.28052254	0.53	0.58
Tcells.Gamma.Delta TCGA Immunity.2018 PMID.29628290	0.53	0.49
Immune.HLA.A.F TCGA.BRCA.1198 JCI.2020 PMID.32573490	0.53	0.58
Tcells.Regulatory Charoentong CellRep.2017 PMID.28052254	0.53	0.58
Tcells.CD8.Exhausted.Anti.PDL1.vs.Control.Metagene.1 Pauken Science.2016 PMID.27789795	0.53	0.51
Immune.CD4.CD53.CD84.BTK TCGA.BRCA.1198 JCI.2020 PMID.32573490	0.53	0.58
Macrophages.M2 CIBERSORT NatMethods.2015 PMID.25822800	0.53	0.60
Tcells Bindea Immunity.2013 PMID.24138885	0.53	0.56

Monocytes ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715	0.53	0.40
Macrophages.Monocytes.CSF1.Response Beck CCR.2009 PMID..19188147	0.53	0.58
Macrophages Bindea Immunity.2013 PMID.24138885	0.53	0.57
Dendritic.cells.Immature. Bindea Immunity.2013 PMID.24138885	0.53	0.48
Dendritic.cells.Immature. Charoentong CellRep.2017 PMID.28052254	0.52	0.42
Tcells.CD8 Bindea Immunity.2013 PMID.24138885	0.52	0.61
Cytotoxic.Lymphocytes.MCP Petitprez Nature.2020 PMID.31942077	0.52	0.58
MDSC.Tumor Schlecker JImmunol.2012 PMID.23152559	0.52	0.55
NK.CD56dim Charoentong CellRep.2017 PMID.28052254	0.52	0.60
Tcells.Gamma.Delta Charoentong CellRep.2017 PMID.28052254	0.52	0.51
NK.MCP Helmink Nature.2020 PMID.31942077	0.52	0.48
MHC.24genes Forero CancerImmunolRes.2016 PMID.26980599	0.52	0.52
Bcells.Tcells.Cooperation Hollern Cell.2019 PMID.31730857	0.52	0.55
Immune.14 Perez JCO.2015 PMID.2560586	0.52	0.52
MHC.I Rody BreastCancerResearch.2008 PMID.19272155	0.52	0.62
IFNg.Module11 Gatza ProcNatlAcadSciUSA.2010 PMID.20335537	0.52	0.53
Bcells.IL10.Minus Lin JImmunol.2014 PMID.25080484	0.51	0.46
Neutrophils ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715	0.51	0.59
NK.ImmuneProfiles.Mouse.Human Shay PNAS.2013 PMID.23382184	0.51	0.48
Immune.Hot.vs.Cold.CD8 Cabrita Nature.2020 PMID.31942071	0.51	0.58
Macrophages.M2 Ghassabeh Blood.2006 PMID.16556895	0.51	0.53
Monocytes CIBERSORT NatMethods.2015 PMID.25822800	0.51	0.59
Mast.cells.Resting CIBERSORT NatMethods.2015 PMID.25822800	0.51	0.52
Cytolytic.Activity Rooney Cell.2015 PMID.25594174	0.51	0.55
Plasmacytoid.Dendritic.cell Charoentong CellRep.2017 PMID.28052254	0.51	0.63
IFNa.Module10 Gatza ProcNatlAcadSciUSA.2010 PMID.20335537	0.51	0.51
IFN.Cluster.GSEA.GP11 Fan BMCMedGenomics.2011 PMID.21214954	0.51	0.51
Tcells.Regulatory.cell.2gene Petitprez Nature.2020 PMID.31942077	0.51	0.45
Influenza.11genes Khatri Immunity.2015 PMID.26682989	0.51	0.52
Wound.Healing Chang PlosBiol.2004 PMID.14737219	0.50	0.50
Tcells.Bcell.KEGG.hematopoietic.cell.lineage GSEA.GP2 ProcNatlAcadSciUSA.2005 PMID.16199517	0.50	0.52
Mast.cell Charoentong CellRep.2017 PMID.28052254	0.50	0.50
Granulocytes.ImmuneProfiles.Mouse.Human Shay PNAS.2013 PMID.23382184	0.50	0.56
Macrophages ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715	0.49	0.60

Using CALGB 40601 as train set, the average AUC of the different models was calculated across all the resamples using 10-fold cross validation. A second AUC was calculated using PAMELA as an external validation set.

eTable 7. Association of Tumor-Infiltrating Lymphocytes (TILs) and Immune Gene Expression Signatures (iGES) With Event-Free Survival (EFS) in CALGB 40601

Signature	HR	Lower CI	Upper CI	P-value	AIC
Bcells.Plasma.cells.Metagene Miller GenomeBiol.2013 PMID.23618380	0.55	0.42	0.73	0.007	401.97
Bcells.Plasma.cells.52genes Miller GenomeBiol.2013 PMID.23618380	0.56	0.42	0.74	0.007	403.55
Ig TCGA.BRCA.1198 Cell.2015 PMID.26451490	0.56	0.42	0.75	0.007	403.91
IgG Rody BreastCancerResearch.2008 PMID.19272155	0.60	0.45	0.80	0.02	406.92
IGG.Cluster Fan BMCMedGenomics.2011 PMID.21214954	0.59	0.44	0.80	0.02	406.97
Immune.14 Perez JCO.2015 PMID.2560586	0.60	0.45	0.81	0.02	407.17
Immune1 TCGA.BRCA.1198 JCI.2020 PMID.32573490	0.59	0.44	0.80	0.02	407.03
Cytotoxic.Lymphocytes.MCP Petitprez Nature.2020 PMID.31942077	0.61	0.45	0.83	0.04	408.82
Plasma.cells ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715	0.64	0.49	0.85	0.04	409.32
MHC.24genes Forero CancerImmunolRes.2016 PMID.26980599	0.59	0.42	0.82	0.04	408.55
Tcells.Follicular.Helper CIBERSORT NatMethods.2015 PMID.25822800	0.61	0.44	0.83	0.04	408.97
Bcells.Tcells.Cooperation Hollern Cell.2019 PMID.31730857	0.62	0.46	0.84	0.04	408.91
TLS.High.In.Response.MCP Helmink Nature.2020 PMID.31942075	0.63	0.47	0.84	0.04	409.27
Immune.87 Perez JCO.2015 PMID.2560586	0.62	0.46	0.85	0.04	409.41
Tcells.CD8.MCP Petitprez Nature.2020 PMID.31942077	0.60	0.43	0.84	0.04	409.44
Tcells.CD4.Naive CIBERSORT NatMethods.2015 PMID.25822800	0.64	0.47	0.86	0.04	409.78
Bcells.Cluster Iglesia CCR.2014 PMID.24916698	0.62	0.45	0.85	0.04	409.39
Tcells.Cluster Iglesia CCR.2014 PMID.24916698	0.63	0.46	0.86	0.04	410.00
Tcells.CD8 CIBERSORT NatMethods.2015 PMID.25822800	0.63	0.46	0.86	0.04	410.11
Tcells.Gamma.Delta CIBERSORT NatMethods.2015 PMID.25822800	0.64	0.48	0.87	0.04	410.39
NK ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715	0.63	0.46	0.87	0.04	410.40
PD1.Signaling.Reactome GSEA ProcNatlAcadSciUSA.2005 PMID.16199517	0.63	0.46	0.87	0.04	410.40
Tcells.Bcells.Lymphocyte.Infiltration Calabro BreastCancerResTreat.2009 PMID.18592372	0.63	0.46	0.87	0.04	410.33
Lymphocyte.Infiltration.Expression.Score TCGA Immunity.2018 PMID.29628290	0.63	0.46	0.87	0.04	410.33

TLS.Tumors.w.TLS.and.CD8.vs.CD8.alone Cabrita Nature.2020 PMID.31942071	0.63	0.45	0.87	0.04	410.21
Tcells.CD8.Activated Charoentong CellRep.2017 PMID.28052254	0.65	0.47	0.88	0.04	410.91
TLS.Hallmark Cabrita Nature.2020 PMID.31942071	0.63	0.46	0.87	0.04	410.83
Immune.CD8.GZMK TCGA.BRCA.1198 JCI.2020 PMID.32573490	0.64	0.47	0.88	0.04	410.73
CD8.Cluster Iglesia CCR.2014 PMID.24916698	0.65	0.47	0.88	0.04	410.82
Tcells.CD4.Memory.Resting CIBERSORT NatMethods.2015 PMID.25822800	0.64	0.47	0.88	0.04	410.81
Tcells.Regulatory.Tregs CIBERSORT NatMethods.2015 PMID.25822800	0.65	0.48	0.89	0.04	410.98
NK.CD56dim Charoentong CellRep.2017 PMID.28052254	1.51	1.12	2.03	0.04	410.92
CTLA4.Pathway GSEA.BIOCARTA ProcNatlAcadSciUSA.2005 PMID.16199517	0.65	0.48	0.89	0.04	411.16
Immune.CD19 TCGA.BRCA.1198 JCI.2020 PMID.32573490	0.63	0.45	0.88	0.04	410.74
Bcells.Activated Charoentong CellRep.2017 PMID.28052254	0.65	0.47	0.89	0.04	411.10
NK.Resting CIBERSORT NatMethods.2015 PMID.25822800	0.64	0.46	0.89	0.04	411.14
Bcells.Memory CIBERSORT NatMethods.2015 PMID.25822800	0.64	0.47	0.89	0.04	411.21

Cox regression models for EFS prediction in CALGB 40601 have been adjusted by treatment arm. Only the models significantly associated with EFS with a p-value <0.05 are shown. P-values are adjusted for multiple testing using a Benjamini & Hochberg method to control the False Discovery Rate.

eTable 8. Association of Tumor-Infiltrating Lymphocytes (TILs) as a Continuous Variable and Immune Gene Expression Signatures (iGES) With Event-Free Survival (EFS) in CALGB 40601

Comparative analysis of nested multivariable Cox regression models.

Signature:Plasma.cells ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715						
Model	**Features**	**HR**	**95% CI**	**p-value[1]**	**AIC**	**LR p-value[2]**
Model 1	THL vs. TH	0.34	0.14, 0.78	**0.01**	395.68	-
	TL vs. TH	1.27	0.62, 2.60	0.51		
	HR (pos vs. neg)	1.86	0.94, 3.69	0.08		
	Stage (III vs. II)	2.03	1.07, 3.87	**0.03**		
	pCR (pCR vs. RD)	0.22	0.10, 0.48	**<0.001**		
	HER2-E vs. Other	4.2	1.97, 8.96	**<0.001**		
Model 2	THL vs. TH	0.31	0.13, 0.73	**0.007**	395.31	Model 2 vs. Model 1 LRT p-value 0.12
	TL vs. TH	1.3	0.63, 2.67	0.48		
	HR (pos vs. neg)	1.85	0.93, 3.69	0.08		
	Stage (III vs. II)	1.95	1.02, 3.71	**0.04**		
	pCR (pCR vs. RD)	0.24	0.11, 0.54	**<0.001**		
	HER2-E vs. not	4.53	2.11, 9.73	**<0.001**		
	TILs (continuous)	0.99	0.97, 1.00	0.14		
Model 3	THL vs. TH	0.3	0.13, 0.71	**0.006**	388.34	Model 3 vs. Model 1 LRT p-value **<0.001**
	TL vs. TH	1.55	0.74, 3.26	0.24		
	HR (pos vs. neg)	1.84	0.93, 3.63	0.08		
	Stage (III vs. II)	2.04	1.07, 3.89	**0.03**		
	pCR (pCR vs. RD)	0.32	0.14, 0.74	**0.007**		
	HER2-E vs. not	5.43	2.47, 11.9	**<0.001**		
	Signature (cont)	0.59	0.42, 0.82	**0.002**		
Model 4	THL vs. TH	0.3	0.13, 0.71	**0.006**	390.32	Model 4 vs. Model 2 LRT p-value **0.008**
	TL vs. TH	1.56	0.74, 3.29	0.24		
	HR (pos vs. neg)	1.84	0.93, 3.62	0.08		
	Stage (III vs. II)	2.05	1.07, 3.91	**0.03**		
	pCR (pCR vs. RD)	0.32	0.14, 0.74	**0.007**		Model 4 vs. Model 3 LRT p-value 0.90
	HER2-E vs. not	5.43	2.47, 12.0	**<0.001**		
	TILs (continuous)	1	0.98, 1.02	0.90		
	Signature (continuous)	0.58	0.39, 0.86	**0.007**		
Signature: Bcells.Plasma.cells.52genes Miller GenomeBiol.2013 PMID.23618380						
Model	**Features**	**HR**	**95% CI**	**p-value[1]**	**AIC**	**LR p-value[2]**
Model 1	THL vs. TH	0.34	0.14, 0.78	**0.01**	395.68	-
	TL vs. TH	1.27	0.62, 2.60	0.51		
	HR (pos vs. neg)	1.86	0.94, 3.69	0.08		
	Stage (III vs. II)	2.03	1.07, 3.87	**0.03**		
	pCR (pCR vs. RD)	0.22	0.10, 0.48	**<0.001**		

	HER2-E vs. Other	4.2	1.97, 8.96	**<0.001**		
Model 2	THL vs. TH	0.31	0.13, 0.73	**0.007**	395.31	Model 2 vs. Model 1 LRT p-value 0.12
	TL vs. TH	1.3	0.63, 2.67	0.48		
	HR (pos vs. neg)	1.85	0.93, 3.69	0.08		
	Stage (III vs. II)	1.95	1.02, 3.71	**0.04**		
	pCR (pCR vs. RD)	0.24	0.11, 0.54	**<0.001**		
	HER2-E vs. not	4.53	2.11, 9.73	**<0.001**		
	TILs (continuous)	0.99	0.97, 1.00	0.14		
Model 3	THL vs. TH	0.29	0.12, 0.68	**0.005**	385.04	Model 3 vs. Model 1 LRT p-value **0.004**
	TL vs. TH	1.57	0.75, 3.27	0.23		
	HR (pos vs. neg)	1.36	0.68, 2.73	0.39		
	Stage (III vs. II)	2.2	1.15, 4.19	**0.02**		
	pCR (pCR vs. RD)	0.34	0.15, 0.76	**0.008**		
	HER2-E vs. not	4.73	2.20, 10.1	**<0.001**		
	Signature (cont)	0.53	0.38, 0.75	**<0.001**		
Model 4	THL vs. TH	0.3	0.13, 0.71	**0.006**	386.88	Model 4 vs. Model 2 LRT p-value **0.001**
	TL vs. TH	1.6	0.76, 3.36	0.22		
	HR (pos vs. neg)	1.34	0.66, 2.69	0.42		
	Stage (III vs. II)	2.23	1.17, 4.26	**0.02**		
	pCR (pCR vs. RD)	0.33	0.15, 0.75	**0.008**		Model 4 vs. Model 3 LRT p-value 0.69
	HER2-E vs. not	4.68	2.17, 10.1	**<0.001**		
	TILs (continuous)	1	0.99, 1.02	0.68		
	Signature (continuous)	0.51	0.34, 0.76	**<0.001**		
Signature: Ig TCGA.BRCA.1198 Cell.2015 PMID.26451490						
Model	**Features**	**HR**	**95% CI**	**p-value[1]**	**AIC**	**LR p-value[2]**
Model 1	THL vs. TH	0.34	0.14, 0.78	**0.01**	395.68	-
	TL vs. TH	1.27	0.62, 2.60	0.51		
	HR (pos vs. neg)	1.86	0.94, 3.69	0.08		
	Stage (III vs. II)	2.03	1.07, 3.87	**0.03**		
	pCR (pCR vs. RD)	0.22	0.10, 0.48	**<0.001**		
	HER2-E vs. Other	4.2	1.97, 8.96	**<0.001**		
Model 2	THL vs. TH	0.31	0.13, 0.73	**0.007**	395.31	Model 2 vs. Model 1 LRT p-value 0.12
	TL vs. TH	1.3	0.63, 2.67	0.48		
	HR (pos vs. neg)	1.85	0.93, 3.69	0.08		
	Stage (III vs. II)	1.95	1.02, 3.71	**0.04**		
	pCR (pCR vs. RD)	0.24	0.11, 0.54	**<0.001**		
	HER2-E vs. not	4.53	2.11, 9.73	**<0.001**		
	TILs (continuous)	0.99	0.97, 1.00	0.14		
Model 3	THL vs. TH	0.31	0.13, 0.73	**0.007**	384.82	Model 3 vs. Model 1 LRT p-value **<0.001**
	TL vs. TH	1.71	0.81, 3.59	0.16		
	HR (pos vs. neg)	1.48	0.74, 2.93	0.27		
	Stage (III vs. II)	2.34	1.22, 4.47	**0.01**		

	pCR (pCR vs. RD)	0.34	0.15, 0.77	**0.01**		
	HER2-E vs. not	4.81	2.24, 10.3	**<0.001**		
	Signature (cont)	0.53	0.37, 0.75	**<0.001**		
Model 4	THL vs. TH	0.32	0.14, 0.75	**0.009**	386.66	Model 4 vs. Model 2 LRT p-value **0.001**
	TL vs. TH	1.75	0.82, 3.72	0.15		
	HR (pos vs. neg)	1.47	0.74, 2.90	0.27		
	Stage (III vs. II)	2.38	1.24, 4.59	**0.01**		
	pCR (pCR vs. RD)	0.34	0.15, 0.76	**0.009**		Model 4 vs. Model 3 LRT p-value 0.69
	HER2-E vs. not	4.77	2.22, 10.2	**<0.001**		
	TILs (continuous)	1	0.99, 1.02	0.69		
	Signature (continuous)	0.5	0.33, 0.76	**0.001**		
Signature: Immune1 TCGA.BRCA.1198 JCI.2020 PMID.32573490						
Model	**Features**	**HR**	**95% CI**	**p-value[1]**	**AIC**	**LR p-value[2]**
Model 1	THL vs. TH	0.34	0.14, 0.78	**0.01**	395.68	-
	TL vs. TH	1.27	0.62, 2.60	0.51		
	HR (pos vs. neg)	1.86	0.94, 3.69	0.08		
	Stage (III vs. II)	2.03	1.07, 3.87	**0.03**		
	pCR (pCR vs. RD)	0.22	0.10, 0.48	**<0.001**		
	HER2-E vs. Other	4.2	1.97, 8.96	**<0.001**		
Model 2	THL vs. TH	0.31	0.13, 0.73	**0.007**	395.31	Model 2 vs. Model 1 LRT p-value 0.12
	TL vs. TH	1.3	0.63, 2.67	0.48		
	HR (pos vs. neg)	1.85	0.93, 3.69	0.08		
	Stage (III vs. II)	1.95	1.02, 3.71	**0.04**		
	pCR (pCR vs. RD)	0.24	0.11, 0.54	**<0.001**		
	HER2-E vs. not	4.53	2.11, 9.73	**<0.001**		
	TILs (continuous)	0.99	0.97, 1.00	0.14		
Model 3	THL vs. TH	0.3	0.13, 0.71	**0.006**	389.43	Model 3 vs. Model 1 LRT p-value **0.004**
	TL vs. TH	1.49	0.72, 3.11	0.29		
	HR (pos vs. neg)	1.47	0.73, 2.95	0.28		
	Stage (III vs. II)	2.1	1.10, 4.00	**0.03**		
	pCR (pCR vs. RD)	0.31	0.14, 0.71	**0.005**		
	HER2-E vs. not	4.41	2.07, 9.38	**<0.001**		
	Signature (cont)	0.6	0.43, 0.85	**0.004**		
Model 4	THL vs. TH	0.3	0.13, 0.71	**0.006**	391.41	Model 4 vs. Model 2 LRT p-value **0.02**
	TL vs. TH	1.5	0.72, 3.14	0.28		
	HR (pos vs. neg)	1.46	0.72, 2.95	0.30		
	Stage (III vs. II)	2.11	1.10, 4.03	**0.02**		
	pCR (pCR vs. RD)	0.31	0.14, 0.71	**0.005**		Model 4 vs. Model 3 LRT p-value 0.88
	HER2-E vs. not	4.39	2.06, 9.36	**<0.001**		
	TILs (continuous)	1	0.98, 1.02	0.88		
	Signature (continuous)	0.59	0.39, 0.90	**0.014**		

Signature: IgG Rody BreastCancerResearch.2008 PMID.19272155						
Model	**Features**	**HR**	**95% CI**	**p-value[1]**	**AIC**	**LR p-value[2]**
Model 1	THL vs. TH	0.34	0.14, 0.78	**0.011**	395.68	-
	TL vs. TH	1.27	0.62, 2.60	0.51		
	HR (pos vs. neg)	1.86	0.94, 3.69	0.08		
	Stage (III vs. II)	2.03	1.07, 3.87	**0.03**		
	pCR (pCR vs. RD)	0.22	0.10, 0.48	**<0.001**		
	HER2-E vs. Other	4.2	1.97, 8.96	**<0.001**		
Model 2	THL vs. TH	0.31	0.13, 0.73	**0.007**	395.31	Model 2 vs. Model 1 LRT p-value 0.12
	TL vs. TH	1.3	0.63, 2.67	0.48		
	HR (pos vs. neg)	1.85	0.93, 3.69	0.08		
	Stage (III vs. II)	1.95	1.02, 3.71	**0.04**		
	pCR (pCR vs. RD)	0.24	0.11, 0.54	**<0.001**		
	HER2-E vs. not	4.53	2.11, 9.73	**<0.001**		
	TILs (continuous)	0.99	0.97, 1.00	0.14		
Model 3	THL vs. TH	0.33	0.14, 0.76	**0.009**	387.85	Model 3 vs. Model 1 LRT p-value **0.002**
	TL vs. TH	1.59	0.76, 3.32	0.22		
	HR (pos vs. neg)	1.52	0.76, 3.02	0.24		
	Stage (III vs. II)	2.3	1.20, 4.40	**0.01**		
	pCR (pCR vs. RD)	0.31	0.14, 0.69	**0.004**		
	HER2-E vs. not	4.71	2.20, 10.1	**<0.001**		
	Signature (cont)	0.57	0.41, 0.81	**0.002**		
Model 4	THL vs. TH	0.33	0.14, 0.77	**0.01**	389.85	Model 4 vs. Model 2 LRT p-value **0.006**
	TL vs. TH	1.59	0.76, 3.35	0.22		
	HR (pos vs. neg)	1.51	0.76, 3.02	0.24		
	Stage (III vs. II)	2.31	1.20, 4.45	**0.01**		
	pCR (pCR vs. RD)	0.31	0.14, 0.69	**0.004**		Model 4 vs. Model 3 LRT p-value 0.96
	HER2-E vs. not	4.7	2.20, 10.1	**<0.001**		
	TILs (continuous)	1	0.98, 1.02	0.96		
	Signature (continuous)	0.57	0.38, 0.85	**0.006**		

CI: confident intervals; EFS: event-free survival; HR: hormone receptor; pCR: pathologic complete response; RD: residual disease; pos: positive; neg: negative; HER2-E: HER2-Enriched; AIC: Akaike Information Criterion; LR: likelihood-ratio test; TILs: tumor infiltrating lymphocytes; IgG: immunoglobulin G; T: weekly paclitaxel; H: trastuzumab; L: lapatinib. [1]Cox regression model p-value; [2]Likelihood-ratio test p-value.

eTable 9. Association of Tumor-Infiltrating Lymphocytes (TILs) Using a Cutoff of 40% and Immune Gene Expression Signatures (iGES) With Event-Free Survival (EFS) in CALGB 40601

Comparative analysis of nested multivariable Cox regression models.

Signature: IGG.Cluster Fan BMCMedGenomics.2011 PMID.21214954						
Model	**Features**	**HR**	**95% CI**	**p-value[1]**	**AIC**	**LR p-value[2]**
Model 1	THL vs. TH	0.34	0.14, 0.78	**0.011**	395.68	-
	TL vs. TH	1.27	0.62, 2.60	0.511		
	HR (pos vs. neg)	1.86	0.94, 3.69	0.076		
	Stage (III vs. II)	2.03	1.07, 3.87	**0.031**		
	pCR (pCR vs. RD)	0.22	0.10, 0.48	**<0.001**		
	HER2-E vs. Other	4.2	1.97, 8.96	**<0.001**		
Model 2	THL vs. TH	0.31	0.13, 0.73	**0.007**	394.78	Model 2 vs. Model 1 LRT p-value 0.09
	TL vs. TH	1.27	0.62, 2.61	0.513		
	HR (pos vs. neg)	1.87	0.94, 3.73	0.076		
	Stage (III vs. II)	1.92	1.01, 3.66	**0.046**		
	pCR (pCR vs. RD)	0.25	0.11, 0.54	**<0.001**		
	HER2-E vs. not	4.51	2.10, 9.68	**<0.001**		
	TILs High vs. Low (40%)	0.49	0.20, 1.19	0.113		
Model 3	THL vs. TH	0.31	0.13, 0.71	**0.006**	389.97	Model 3 vs. Model 1 LRT p-value **0.005**
	TL vs. TH	1.45	0.70, 3.02	0.322		
	HR (pos vs. neg)	1.43	0.71, 2.90	0.319		
	Stage (III vs. II)	2.01	1.06, 3.83	**0.033**		
	pCR (pCR vs. RD)	0.3	0.13, 0.66	**0.003**		
	HER2-E vs. not	4.28	2.02, 9.08	**<0.001**		
	Signature (cont)	0.63	0.45, 0.87	**0.006**		
Model 4	THL vs. TH	0.3	0.13, 0.70	**0.006**	391.74	Model 4 vs. Model 2 LRT p-value **0.03**
	TL vs. TH	1.43	0.69, 2.99	0.339		
	HR (pos vs. neg)	1.46	0.72, 2.97	0.299		
	Stage (III vs. II)	2	1.05, 3.80	**0.035**		
	pCR (pCR vs. RD)	0.3	0.13, 0.68	**0.004**		Model 4 vs. Model 3

	HER2-E vs. not	4.33	2.04, 9.21	**<0.001**		LRT p-value 0.63
	TILs High vs. Low (40%)	0.79	0.29, 2.14	0.639		
	Signature (continuous)	0.65	0.45, 0.95	**0.024**		
Signature: Plasma.cells ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715						
Model	**Features**	**HR**	**95% CI**	**p-value[1]**	**AIC**	**LR p-value[2]**
Model 1	THL vs. TH	0.34	0.14, 0.78	**0.011**	395.68	-
	TL vs. TH	1.27	0.62, 2.60	0.511		
	HR (pos vs. neg)	1.86	0.94, 3.69	0.076		
	Stage (III vs. II)	2.03	1.07, 3.87	**0.031**		
	pCR (pCR vs. RD)	0.22	0.10, 0.48	**<0.001**		
	HER2-E vs. Other	4.2	1.97, 8.96	**<0.001**		
Model 2	THL vs. TH	0.31	0.13, 0.73	**0.007**	394.78	Model 2 vs. Model 1 LRT p-value 0.09
	TL vs. TH	1.27	0.62, 2.61	0.513		
	HR (pos vs. neg)	1.87	0.94, 3.73	0.076		
	Stage (III vs. II)	1.92	1.01, 3.66	**0.046**		
	pCR (pCR vs. RD)	0.25	0.11, 0.54	**<0.001**		
	HER2-E vs. not	4.51	2.10, 9.68	**<0.001**		
	TILs High vs. Low (40%)	0.49	0.20, 1.19	0.113		
Model 3	THL vs. TH	0.3	0.13, 0.71	**0.006**	388.34	Model 3 vs. Model 1 LRT p-value **0.002**
	TL vs. TH	1.55	0.74, 3.26	0.243		
	HR (pos vs. neg)	1.84	0.93, 3.63	0.081		
	Stage (III vs. II)	2.04	1.07, 3.89	**0.031**		
	pCR (pCR vs. RD)	0.32	0.14, 0.74	**0.007**		
	HER2-E vs. not	5.43	2.47, 11.9	**<0.001**		
	Signature (cont)	0.59	0.42, 0.82	**0.002**		
Model 4	THL vs. TH	0.3	0.13, 0.70	**0.005**	390.20	Model 4 vs. Model 2 LRT p-value **0.01**
	TL vs. TH	1.54	0.73, 3.23	0.257		
	HR (pos vs. neg)	1.84	0.93, 3.64	0.08		
	Stage (III vs. II)	2.03	1.06, 3.87	**0.032**		

	pCR (pCR vs. RD)	0.33	0.14, 0.75	**0.008**		Model 4 vs. Model 3 LRT p-value 0.71
	HER2-E vs. not	5.4	2.46, 11.9	**<0.001**		
	TILs High vs. Low (40%)	0.83	0.30, 2.26	0.714		
	Signature (continuous)	0.61	0.42, 0.88	**0.009**		
Signature: Bcells.Plasma.cells.52genes Miller GenomeBiol.2013 PMID.23618380						
Model	**Features**	**HR**	**95% CI**	**p-value[1]**	**AIC**	**LR p-value[2]**
Model 1	THL vs. TH	0.34	0.14, 0.78	**0.011**	395.68	-
	TL vs. TH	1.27	0.62, 2.60	0.511		
	HR (pos vs. neg)	1.86	0.94, 3.69	0.076		
	Stage (III vs. II)	2.03	1.07, 3.87	**0.031**		
	pCR (pCR vs. RD)	0.22	0.10, 0.48	**<0.001**		
	HER2-E vs. Other	4.2	1.97, 8.96	**<0.001**		
Model 2	THL vs. TH	0.31	0.13, 0.73	**0.007**	394.78	Model 2 vs. Model 1 LRT p-value 0.09
	TL vs. TH	1.27	0.62, 2.61	0.513		
	HR (pos vs. neg)	1.87	0.94, 3.73	0.076		
	Stage (III vs. II)	1.92	1.01, 3.66	**0.046**		
	pCR (pCR vs. RD)	0.25	0.11, 0.54	**<0.001**		
	HER2-E vs. not	4.51	2.10, 9.68	**<0.001**		
	TILs High vs. Low (40%)	0.49	0.20, 1.19	0.113		
Model 3	THL vs. TH	0.29	0.12, 0.68	**0.005**	385.04	Model 3 vs. Model 1 LRT p-value **<0.001**
	TL vs. TH	1.57	0.75, 3.27	0.234		
	HR (pos vs. neg)	1.36	0.68, 2.73	0.388		
	Stage (III vs. II)	2.2	1.15, 4.19	**0.016**		
	pCR (pCR vs. RD)	0.34	0.15, 0.76	**0.008**		
	HER2-E vs. not	4.73	2.20, 10.1	**<0.001**		
	Signature (cont)	0.53	0.38, 0.75	**<0.001**		
Model 4	THL vs. TH	0.29	0.12, 0.68	**0.005**	387.03	Model 4 vs. Model 2 LRT p-value **0.002**
	TL vs. TH	1.56	0.74, 3.27	0.243		
	HR (pos vs. neg)	1.36	0.68, 2.75	0.385		

	Stage (III vs. II)	2.19	1.15, 4.19	**0.017**		
	pCR (pCR vs. RD)	0.34	0.15, 0.76	**0.009**		Model 4 vs. Model 3 LRT p-value 0.92
	HER2-E vs. not	4.73	2.20, 10.2	**<0.001**		
	TILs High vs. Low (40%)	0.95	0.35, 2.59	0.915		
	Signature (continuous)	0.54	0.37, 0.78	**0.001**		
Signature: Ig TCGA.BRCA.1198 Cell.2015 PMID.26451490						
Model	**Features**	**HR**	**95% CI**	**p-value[1]**	**AIC**	**LR p-value[2]**
Model 1	THL vs. TH	0.34	0.14, 0.78	**0.011**	395.68	-
	TL vs. TH	1.27	0.62, 2.60	0.511		
	HR (pos vs. neg)	1.86	0.94, 3.69	0.076		
	Stage (III vs. II)	2.03	1.07, 3.87	**0.031**		
	pCR (pCR vs. RD)	0.22	0.10, 0.48	**<0.001**		
	HER2-E vs. Other	4.2	1.97, 8.96	**<0.001**		
Model 2	THL vs. TH	0.31	0.13, 0.73	**0.007**	394.78	Model 2 vs. Model 1 LRT p-value 0.09
	TL vs. TH	1.27	0.62, 2.61	0.513		
	HR (pos vs. neg)	1.87	0.94, 3.73	0.076		
	Stage (III vs. II)	1.92	1.01, 3.66	**0.046**		
	pCR (pCR vs. RD)	0.25	0.11, 0.54	**<0.001**		
	HER2-E vs. not	4.51	2.10, 9.68	**<0.001**		
	TILs High vs. Low (40%)	0.49	0.20, 1.19	0.113		
Model 3	THL vs. TH	0.31	0.13, 0.73	**0.007**	384.82	Model 3 vs. Model 1 LRT p-value **<0.001**
	TL vs. TH	1.71	0.81, 3.59	0.16		
	HR (pos vs. neg)	1.48	0.74, 2.93	0.265		
	Stage (III vs. II)	2.34	1.22, 4.47	**0.01**		
	pCR (pCR vs. RD)	0.34	0.15, 0.77	**0.01**		
	HER2-E vs. not	4.81	2.24, 10.3	**<0.001**		
	Signature (cont)	0.53	0.37, 0.75	**<0.001**		
Model 4	THL vs. TH	0.31	0.13, 0.73	**0.007**	386.82	Model 4 vs. Model 2
	TL vs. TH	1.7	0.80, 3.61	0.169		

	HR (pos vs. neg)	1.48	0.74, 2.94	0.264		LRT p-value **0.002**
	Stage (III vs. II)	2.33	1.21, 4.48	**0.011**		
	pCR (pCR vs. RD)	0.34	0.15, 0.78	**0.01**		Model 4 vs. Model 3 LRT p-value 0.94
	HER2-E vs. not	4.81	2.25, 10.3	**<0.001**		
	TILs High vs. Low (40%)	0.96	0.35, 2.63	0.942		
	Signature (continuous)	0.53	0.36, 0.78	**0.001**		
Signature: Immune1 TCGA.BRCA.1198 JCI.2020 PMID.32573490						
Model	**Features**	**HR**	**95% CI**	**p-value[1]**	**AIC**	**LR p-value[2]**
Model 1	THL vs. TH	0.34	0.14, 0.78	**0.011**	395.68	-
	TL vs. TH	1.27	0.62, 2.60	0.511		
	HR (pos vs. neg)	1.86	0.94, 3.69	0.076		
	Stage (III vs. II)	2.03	1.07, 3.87	**0.031**		
	pCR (pCR vs. RD)	0.22	0.10, 0.48	**<0.001**		
	HER2-E vs. Other	4.2	1.97, 8.96	**<0.001**		
Model 2	THL vs. TH	0.31	0.13, 0.73	**0.007**	394.78	Model 2 vs. Model 1 LRT p-value 0.09
	TL vs. TH	1.27	0.62, 2.61	0.513		
	HR (pos vs. neg)	1.87	0.94, 3.73	0.076		
	Stage (III vs. II)	1.92	1.01, 3.66	**0.046**		
	pCR (pCR vs. RD)	0.25	0.11, 0.54	**<0.001**		
	HER2-E vs. not	4.51	2.10, 9.68	**<0.001**		
	TILs High vs. Low (40%)	0.49	0.20, 1.19	0.113		
Model 3	THL vs. TH	0.3	0.13, 0.71	**0.006**	389.43	Model 3 vs. Model 1 LRT p-value **0.004**
	TL vs. TH	1.49	0.72, 3.11	0.285		
	HR (pos vs. neg)	1.47	0.73, 2.95	0.282		
	Stage (III vs. II)	2.1	1.10, 4.00	**0.025**		
	pCR (pCR vs. RD)	0.31	0.14, 0.71	**0.005**		
	HER2-E vs. not	4.41	2.07, 9.38	**<0.001**		
	Signature (cont)	0.6	0.43, 0.85	**0.004**		
Model 4	THL vs. TH	0.3	0.13, 0.70	**0.005**	391.31	

	TL vs. TH	1.48	0.71, 3.09	0.30		Model 4 vs. Model 2 LRT p-value **0.02**
	HR (pos vs. neg)	1.49	0.73, 3.00	0.271		
	Stage (III vs. II)	2.08	1.09, 3.97	**0.027**		
	pCR (pCR vs. RD)	0.32	0.14, 0.71	**0.006**		Model 4 vs. Model 3 LRT p-value 0.73
	HER2-E vs. not	4.44	2.09, 9.46	**<0.001**		
	TILs High vs. Low (40%)	0.84	0.30, 2.32	0.733		
	Signature (continuous)	0.62	0.42, 0.92	**0.019**		
Signature: IgG Rody BreastCancerResearch.2008 PMID.19272155						
Model	**Features**	**HR**	**95% CI**	**p-value[1]**	**AIC**	**LR p-value[2]**
Model 1	THL vs. TH	0.34	0.14, 0.78	**0.011**	395.68	-
	TL vs. TH	1.27	0.62, 2.60	0.511		
	HR (pos vs. neg)	1.86	0.94, 3.69	0.076		
	Stage (III vs. II)	2.03	1.07, 3.87	**0.031**		
	pCR (pCR vs. RD)	0.22	0.10, 0.48	**<0.001**		
	HER2-E vs. Other	4.2	1.97, 8.96	**<0.001**		
Model 2	THL vs. TH	0.31	0.13, 0.73	**0.007**	394.78	Model 2 vs. Model 1 LRT p-value 0.09
	TL vs. TH	1.27	0.62, 2.61	0.513		
	HR (pos vs. neg)	1.87	0.94, 3.73	0.076		
	Stage (III vs. II)	1.92	1.01, 3.66	**0.046**		
	pCR (pCR vs. RD)	0.25	0.11, 0.54	**<0.001**		
	HER2-E vs. not	4.51	2.10, 9.68	**<0.001**		
	TILs High vs. Low (40%)	0.49	0.20, 1.19	0.113		
Model 3	THL vs. TH	0.33	0.14, 0.76	**0.009**	387.85	Model 3 vs. Model 1 LRT p-value **0.002**
	TL vs. TH	1.59	0.76, 3.32	0.217		
	HR (pos vs. neg)	1.52	0.76, 3.02	0.236		
	Stage (III vs. II)	2.3	1.20, 4.40	**0.012**		
	pCR (pCR vs. RD)	0.31	0.14, 0.69	**0.004**		
	HER2-E vs. not	4.71	2.20, 10.1	**<0.001**		
	Signature (cont)	0.57	0.41, 0.81	**0.002**		

Model 4	THL vs. TH	0.32	0.14, 0.75	**0.009**	389.76	Model 4 vs. Model 2 LRT p-value **0.008**
	TL vs. TH	1.57	0.75, 3.30	0.234		
	HR (pos vs. neg)	1.53	0.76, 3.06	0.229		
	Stage (III vs. II)	2.27	1.18, 4.37	**0.014**		
	pCR (pCR vs. RD)	0.31	0.14, 0.69	**0.004**		Model 4 vs. Model 3 LRT p-value 0.77
	HER2-E vs. not	4.72	2.21, 10.1	**<0.001**		
	TILs High vs. Low (40%)	0.86	0.32, 2.34	0.77		
	Signature (continuous)	0.59	0.40, 0.87	**0.007**		

CI: confident intervals; EFS: event-free survival; HR: hormone receptor; pCR: pathologic complete response; RD: residual disease; pos: positive; neg: negative; HER2-E: HER2-Enriched; AIC: Akaike Information Criterion; LR: likelihood-ratio test; TILs: tumor infiltrating lymphocytes; IgG: immunoglobulin G; T: weekly paclitaxel; H: trastuzumab; L: lapatinib. [1]Cox regression model p-value; [2]Likelihood-ratio test p-value.

eTable 10. Landmark Analysis Week 30

Association of tumor-infiltrating lymphocytes (TILs) as continuous variable and immune gene expression signatures (iGES) with event-free survival (EFS) in CALGB 40601: comparative analysis of nested multivariable Cox regression models.

Signature: IGG.Cluster Fan BMCMedGenomics.2011 PMID.21214954						
Model	**Features**	**HR**	**95% CI**	**p-value[1]**	**AIC**	**LR p-value[2]**
Model 1	THL vs. TH	0.37	0.16, 0.87	**0.02**	364.58	-
	TL vs. TH	1.34	0.63, 2.83	0.44		
	HR (pos vs. neg)	2.13	1.03, 4.42	**0.04**		
	Stage (III vs. II)	1.95	0.99, 3.83	0.05		
	pCR (pCR vs. RD)	0.2	0.09, 0.46	**<0.001**		
	HER2-E vs. Other	4.6	2.09, 10.1	**<0.001**		
Model 2	THL vs. TH	0.35	0.15, 0.83	**0.02**	365.28	Model 2 vs. Model 1 LRT p-value 0.25
	TL vs. TH	1.36	0.64, 2.90	0.42		
	HR (pos vs. neg)	2.15	1.03, 4.45	**0.04**		
	Stage (III vs. II)	1.89	0.96, 3.71	0.07		
	pCR (pCR vs. RD)	0.22	0.10, 0.51	**<0.001**		
	HER2-E vs. not	4.9	2.21, 10.9	**<0.001**		
	TILs (continuous)	0.99	0.98, 1.01	0.27		
Model 3	THL vs. TH	0.34	0.14, 0.81	**0.015**	361.31	Model 3 vs. Model 1 LRT p-value **0.02**
	TL vs. TH	1.54	0.71, 3.33	0.27		
	HR (pos vs. neg)	1.71	0.81, 3.60	0.16		
	Stage (III vs. II)	1.95	0.99, 3.83	0.05		
	pCR (pCR vs. RD)	0.27	0.11, 0.62	**0.002**		
	HER2-E vs. not	4.6	2.10, 10.1	**<0.001**		
	Signature (cont)	0.67	0.47, 0.94	**0.02**		
Model 4	THL vs. TH	0.35	0.14, 0.83	**0.02**	363.27	Model 4 vs. Model 2 LRT p-value **0.04**
	TL vs. TH	1.55	0.72, 3.36	0.27		
	HR (pos vs. neg)	1.68	0.79, 3.59	0.18		
	Stage (III vs. II)	1.95	0.99, 3.85	0.05		
	pCR (pCR vs. RD)	0.26	0.11, 0.62	**0.002**		Model 4 vs. Model 3 LRT p-value 0.84
	HER2-E vs. not	4.55	2.07, 10.0	**<0.001**		

	TILs (continuous)	1	0.98, 1.02	0.84		
	Signature (continuous)	0.65	0.43, 0.99	**0.04**		
Signature: Plasma.cells ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715						
Model	**Features**	**HR**	**95% CI**	**p-value[1]**	**AIC**	**LR p-value[2]**
Model 1	THL vs. TH	0.37	0.16, 0.87	**0.02**	364.58	-
	TL vs. TH	1.34	0.63, 2.83	0.45		
	HR (pos vs. neg)	2.13	1.03, 4.42	**0.04**		
	Stage (III vs. II)	1.95	0.99, 3.83	0.05		
	pCR (pCR vs. RD)	0.2	0.09, 0.46	**<0.001**		
	HER2-E vs. Other	4.6	2.09, 10.1	**<0.001**		
Model 2	THL vs. TH	0.35	0.15, 0.83	**0.02**	365.28	Model 2 vs. Model 1 LRT p-value 0.25
	TL vs. TH	1.36	0.64, 2.90	0.42		
	HR (pos vs. neg)	2.15	1.03, 4.45	**0.04**		
	Stage (III vs. II)	1.89	0.96, 3.71	0.07		
	pCR (pCR vs. RD)	0.22	0.10, 0.51	**<0.001**		
	HER2-E vs. not	4.9	2.21, 10.9	**<0.001**		
	TILs (continuous)	0.99	0.98, 1.01	0.27		
Model 3	THL vs. TH	0.34	0.14, 0.80	**0.01**	360.66	Model 3 vs. Model 1 LRT p-value **0.02**
	TL vs. TH	1.61	0.74, 3.49	0.23		
	HR (pos vs. neg)	2.11	1.02, 4.35	**0.04**		
	Stage (III vs. II)	1.96	1.00, 3.86	0.05		
	pCR (pCR vs. RD)	0.28	0.12, 0.66	**0.004**		
	HER2-E vs. not	5.58	2.47, 12.6	**<0.001**		
	Signature (cont)	0.64	0.45, 0.91	**0.01**		
Model 4	THL vs. TH	0.34	0.14, 0.82	**0.02**	362.61	Model 4 vs. Model 2 LRT p-value **0.03**
	TL vs. TH	1.62	0.74, 3.53	0.22		
	HR (pos vs. neg)	2.11	1.02, 4.34	**0.04**		
	Stage (III vs. II)	1.97	1.00, 3.89	0.05		
	pCR (pCR vs. RD)	0.28	0.12, 0.66	**0.004**		Model 4 vs. Model 3 LRT p-value 0.81
	HER2-E vs. not	5.59	2.47, 12.6	**<0.001**		

	TILs (continuous)	1	0.98, 1.02	0.81		
	Signature (continuous)	0.62	0.41, 0.95	**0.03**		
Signature: Bcells.Plasma.cells.52genes Miller GenomeBiol.2013 PMID.23618380						
Model	**Features**	**HR**	**95% CI**	**p-value[1]**	**AIC**	**LR p-value[2]**
Model 1	THL vs. TH	0.37	0.16, 0.87	**0.02**	364.58	-
	TL vs. TH	1.34	0.63, 2.83	0.45		
	HR (pos vs. neg)	2.13	1.03, 4.42	**0.04**		
	Stage (III vs. II)	1.95	0.99, 3.83	0.05		
	pCR (pCR vs. RD)	0.2	0.09, 0.46	**<0.001**		
	HER2-E vs. Other	4.6	2.09, 10.1	**<0.001**		
Model 2	THL vs. TH	0.35	0.15, 0.83	**0.02**	365.28	Model 2 vs. Model 1 LRT p-value 0.25
	TL vs. TH	1.36	0.64, 2.90	0.42		
	HR (pos vs. neg)	2.15	1.03, 4.45	**0.04**		
	Stage (III vs. II)	1.89	0.96, 3.71	0.07		
	pCR (pCR vs. RD)	0.22	0.10, 0.51	**<0.001**		
	HER2-E vs. not	4.9	2.21, 10.9	**<0.001**		
	TILs (continuous)	0.99	0.98, 1.01	0.27		
Model 3	THL vs. TH	0.33	0.14, 0.78	**0.01**	357.02	Model 3 vs. Model 1 LRT p-value **0.002**
	TL vs. TH	1.68	0.78, 3.64	0.19		
	HR (pos vs. neg)	1.62	0.77, 3.38	0.20		
	Stage (III vs. II)	2.1	1.07, 4.13	**0.03**		
	pCR (pCR vs. RD)	0.3	0.13, 0.71	**0.006**		
	HER2-E vs. not	5	2.27, 11.0	**<0.001**		
	Signature (cont)	0.56	0.39, 0.81	**0.002**		
Model 4	THL vs. TH	0.34	0.14, 0.82	**0.02**	358.57	Model 4 vs. Model 2 LRT p-value **0.003**
	TL vs. TH	1.74	0.80, 3.81	0.16		
	HR (pos vs. neg)	1.56	0.74, 3.27	0.239		
	Stage (III vs. II)	2.15	1.09, 4.24	**0.03**		
	pCR (pCR vs. RD)	0.29	0.12, 0.69	**0.005**		Model 4 vs. Model 3 LRT p-value 0.51
	HER2-E vs. not	4.89	2.21, 10.8	**<0.001**		

	TILs (continuous)	1.01	0.99, 1.03	0.50		
	Signature (continuous)	0.52	0.34, 0.79	**0.002**		
Signature: Ig TCGA.BRCA.1198 Cell.2015 PMID.26451490						
Model	**Features**	**HR**	**95% CI**	**p-value[1]**	**AIC**	**LR p-value[2]**
Model 1	THL vs. TH	0.37	0.16, 0.87	**0.02**	364.58	-
	TL vs. TH	1.34	0.63, 2.83	0.45		
	HR (pos vs. neg)	2.13	1.03, 4.42	**0.04**		
	Stage (III vs. II)	1.95	0.99, 3.83	0.05		
	pCR (pCR vs. RD)	0.2	0.09, 0.46	**<0.001**		
	HER2-E vs. Other	4.6	2.09, 10.1	**<0.001**		
Model 2	THL vs. TH	0.35	0.15, 0.83	**0.02**	365.28	Model 2 vs. Model 1 LRT p-value 0.25
	TL vs. TH	1.36	0.64, 2.90	0.42		
	HR (pos vs. neg)	2.15	1.03, 4.45	**0.04**		
	Stage (III vs. II)	1.89	0.96, 3.71	0.07		
	pCR (pCR vs. RD)	0.22	0.10, 0.51	**<0.001**		
	HER2-E vs. not	4.9	2.21, 10.9	**<0.001**		
	TILs (continuous)	0.99	0.98, 1.01	0.27		
Model 3	THL vs. TH	0.35	0.15, 0.83	**0.02**	356.98	Model 3 vs. Model 1 LRT p-value **0.002**
	TL vs. TH	1.81	0.83, 3.95	0.14		
	HR (pos vs. neg)	1.73	0.84, 3.59	0.14		
	Stage (III vs. II)	2.21	1.12, 4.37	**0.02**		
	pCR (pCR vs. RD)	0.31	0.13, 0.72	**0.007**		
	HER2-E vs. not	5.06	2.30, 11.1	**<0.001**		
	Signature (cont)	0.56	0.39, 0.81	**0.002**		
Model 4	THL vs. TH	0.36	0.15, 0.87	**0.02**	358.58	Model 4 vs. Model 2 LRT p-value **0.003**
	TL vs. TH	1.89	0.85, 4.17	0.12		
	HR (pos vs. neg)	1.7	0.82, 3.51	0.15		
	Stage (III vs. II)	2.29	1.15, 4.56	**0.02**		
	pCR (pCR vs. RD)	0.3	0.13, 0.71	**0.006**		Model 4 vs. Model 3 LRT p-value 0.53
	HER2-E vs. not	4.97	2.25, 11.0	**<0.001**		

	TILs (continuous)	1.01	0.99, 1.02	0.52		
	Signature (continuous)	0.52	0.34, 0.80	**0.003**		
Signature: Immune1 TCGA.BRCA.1198 JCI.2020 PMID.32573490						
Model	**Features**	**HR**	**95% CI**	**p-value[1]**	**AIC**	**LR p-value[2]**
Model 1	THL vs. TH	0.37	0.16, 0.87	**0.02**	364.58	-
	TL vs. TH	1.34	0.63, 2.83	0.45		
	HR (pos vs. neg)	2.13	1.03, 4.42	**0.04**		
	Stage (III vs. II)	1.95	0.99, 3.83	0.05		
	pCR (pCR vs. RD)	0.2	0.09, 0.46	**<0.001**		
	HER2-E vs. Other	4.6	2.09, 10.1	**<0.001**		
Model 2	THL vs. TH	0.35	0.15, 0.83	**0.02**	365.28	Model 2 vs. Model 1 LRT p-value 0.25
	TL vs. TH	1.36	0.64, 2.90	0.42		
	HR (pos vs. neg)	2.15	1.03, 4.45	**0.04**		
	Stage (III vs. II)	1.89	0.96, 3.71	0.07		
	pCR (pCR vs. RD)	0.22	0.10, 0.51	**<0.001**		
	HER2-E vs. not	4.9	2.21, 10.9	**<0.001**		
	TILs (continuous)	0.99	0.98, 1.01	0.27		
Model 3	THL vs. TH	0.34	0.14, 0.80	**0.01**	360.55	Model 3 vs. Model 1 LRT p-value **0.01**
	TL vs. TH	1.59	0.74, 3.45	0.24		
	HR (pos vs. neg)	1.73	0.83, 3.63	0.14		
	Stage (III vs. II)	2.02	1.02, 3.97	**0.04**		
	pCR (pCR vs. RD)	0.28	0.12, 0.66	**0.004**		
	HER2-E vs. not	4.73	2.16, 10.4	**<0.001**		
	Signature (cont)	0.64	0.44, 0.91	**0.01**		
Model 4	THL vs. TH	0.34	0.14, 0.83	**0.02**	362.40	Model 4 vs. Model 2 LRT p-value **0.03**
	TL vs. TH	1.62	0.75, 3.52	0.22		
	HR (pos vs. neg)	1.69	0.80, 3.57	0.17		
	Stage (III vs. II)	2.04	1.03, 4.04	**0.04**		
	pCR (pCR vs. RD)	0.28	0.12, 0.66	**0.003**		Model 4 vs. Model 3 LRT p-value 0.70
	HER2-E vs. not	4.64	2.11, 10.2	**<0.001**		

	TILs (continuous)	1	0.98, 1.02	0.70		
	Signature (continuous)	0.6	0.39, 0.94	**0.03**		
Signature: IgG Rody BreastCancerResearch.2008 PMID.19272155						
Model	**Features**	**HR**	**95% CI**	**p-value[1]**	**AIC**	**LR p-value[2]**
Model 1	THL vs. TH	0.37	0.16, 0.87	**0.02**	364.58	-
	TL vs. TH	1.34	0.63, 2.83	0.45		
	HR (pos vs. neg)	2.13	1.03, 4.42	**0.04**		
	Stage (III vs. II)	1.95	0.99, 3.83	0.05		
	pCR (pCR vs. RD)	0.2	0.09, 0.46	**<0.001**		
	HER2-E vs. Other	4.6	2.09, 10.1	**<0.001**		
Model 2	THL vs. TH	0.35	0.15, 0.83	**0.02**	365.28	Model 2 vs. Model 1 LRT p-value 0.25
	TL vs. TH	1.36	0.64, 2.90	0.42		
	HR (pos vs. neg)	2.15	1.03, 4.45	**0.04**		
	Stage (III vs. II)	1.89	0.96, 3.71	0.07		
	pCR (pCR vs. RD)	0.22	0.10, 0.51	**<0.001**		
	HER2-E vs. not	4.9	2.21, 10.9	**<0.001**		
	TILs (continuous)	0.99	0.98, 1.01	0.27		
Model 3	THL vs. TH	0.36	0.15, 0.86	**0.02**	359.43	Model 3 vs. Model 1 LRT p-value **0.007**
	TL vs. TH	1.69	0.78, 3.67	0.18		
	HR (pos vs. neg)	1.79	0.86, 3.71	0.12		
	Stage (III vs. II)	2.19	1.11, 4.31	**0.02**		
	pCR (pCR vs. RD)	0.28	0.12, 0.65	**0.003**		
	HER2-E vs. not	4.97	2.26, 10.9	**<0.001**		
	Signature (cont)	0.61	0.43, 0.87	**0.007**		
Model 4	THL vs. TH	0.37	0.15, 0.88	**0.03**	361.35	Model 4 vs. Model 2 LRT p-value **0.02**
	TL vs. TH	1.72	0.79, 3.75	0.17		
	HR (pos vs. neg)	1.77	0.85, 3.68	0.13		
	Stage (III vs. II)	2.22	1.11, 4.42	**0.02**		
	pCR (pCR vs. RD)	0.28	0.12, 0.65	**0.003**		Model 4 vs. Model 3 LRT p-value 0.78
	HER2-E vs. not	4.93	2.24, 10.9	**<0.001**		

	TILs (continuous)	1	0.98, 1.02	0.78		
	Signature (continuous)	0.59	0.39, 0.90	**0.01**		

CI: confident intervals; EFS: event-free survival; HR: hormone receptor; pCR: in-breast pathologic complete response; RD: residual disease; pos: positive; neg: negative; HER2-E: HER2-Enriched; AIC: Akaike Information Criterion; LR: likelihood-ratio test; TILs: tumor infiltrating lymphocytes; IgG: immunoglobulin G; T: weekly paclitaxel; H: trastuzumab; L: lapatinib. [1]Cox regression model p-value; [2]Likelihood-ratio test p-value.

eTable 11. Summary Table of Akaike Information Criteria (AIC) and C-Index From Multivariable Cox Models Including Immune Gene Expression Signatures (iGES)

iGES ID	AIC	c-index
IGG.Cluster Fan BMCMedGenomics.2011 PMID.21214954	389.97	0.76
Plasma.cells ImSig.Nirmal CancerImmunolRes.2018 PMID.30266715	388.34	0.73
Bcells.Plasma.cells.52genes Miller GenomeBiol.2013 PMID.23618380	385.04	0.77
Ig TCGA.BRCA.1198 Cell.2015 PMID.26451490	384.82	0.77
Immune1 TCGA.BRCA.1198 JCI.2020 PMID.32573490	389.43	0.74
IgG Rody BreastCancerResearch.2008 PMID.19272155	387.85	0.74

A median c-index was calculated for each model using 5-folds cross validation.

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