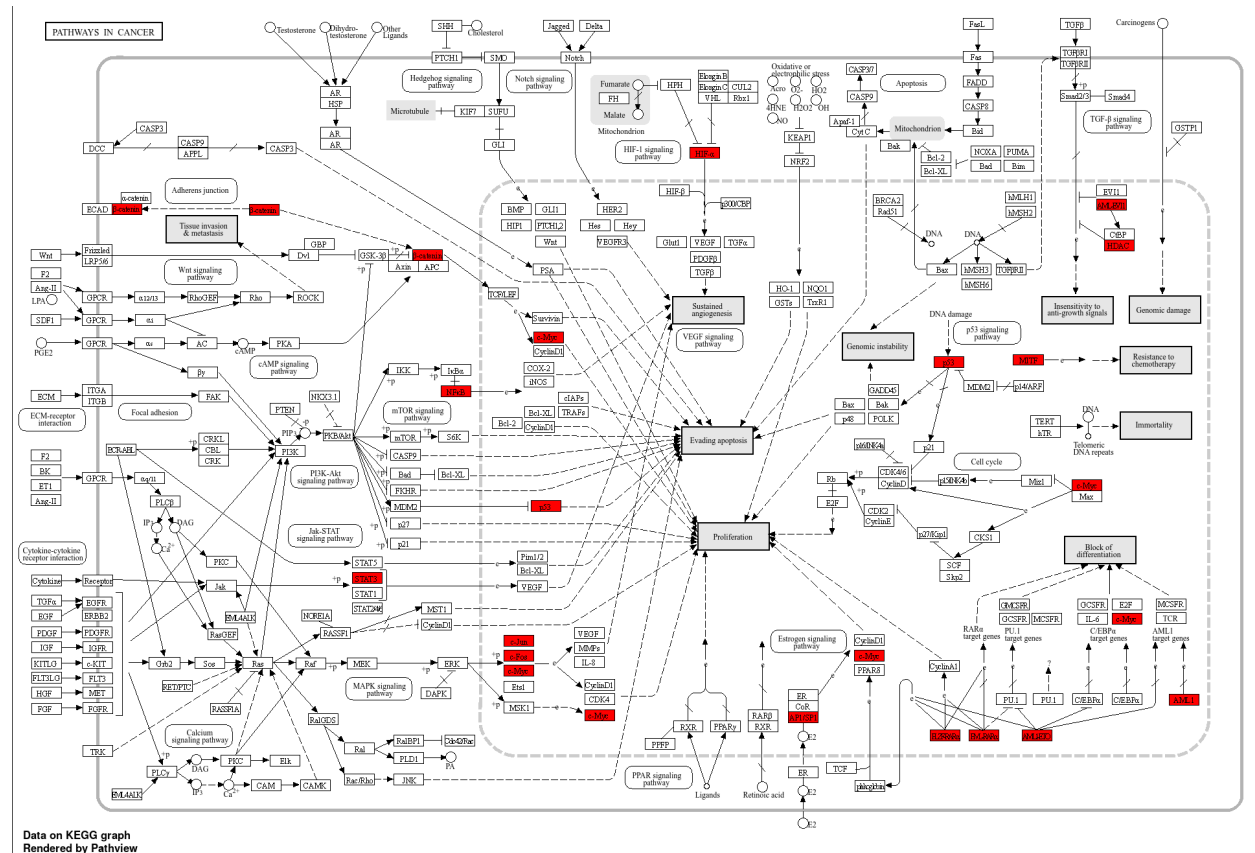
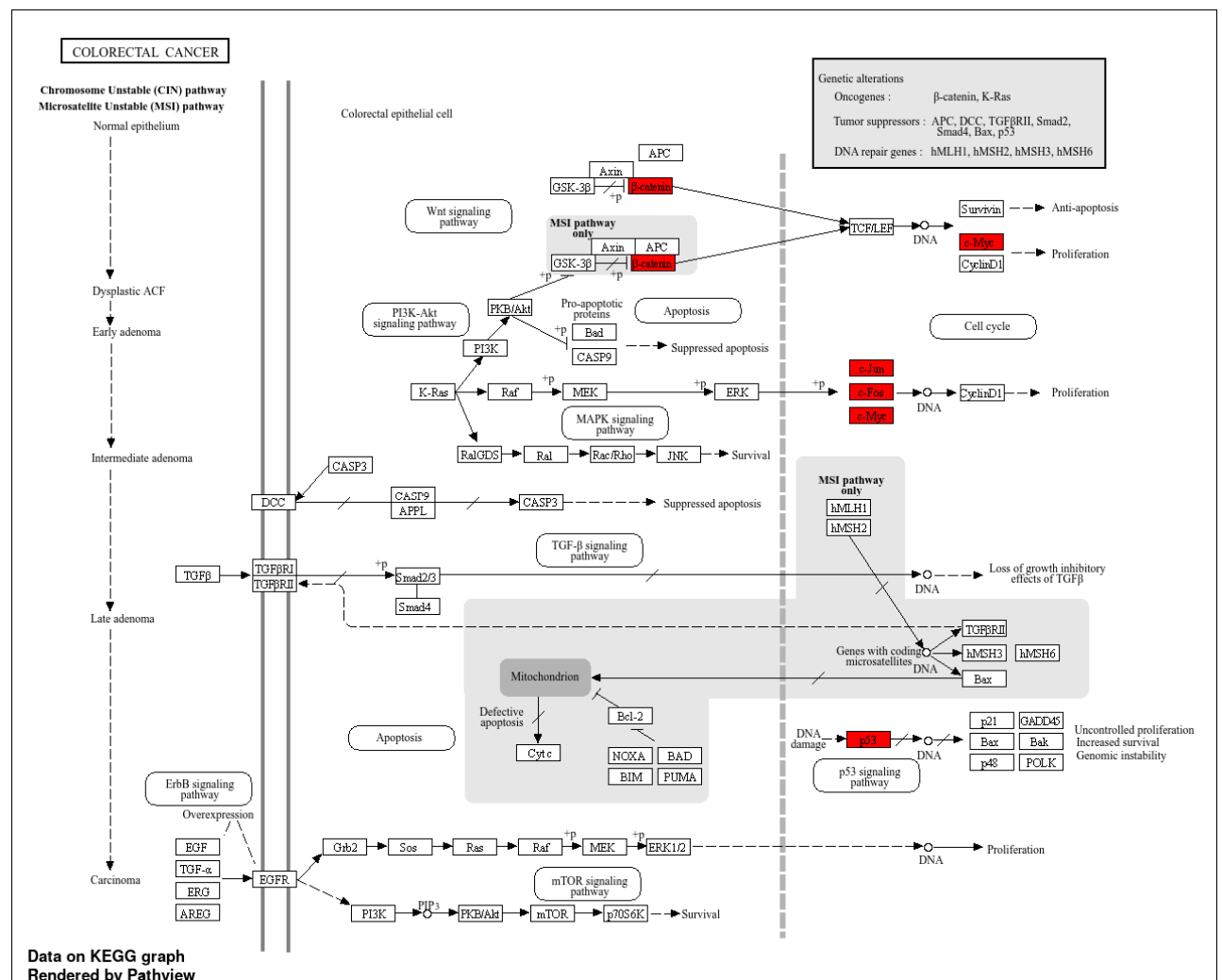


Figure S1- KEGG pathways that were used for model building [41,42]

A-Pathway 05200N-Pathways in cancer



B-Pathway 05210N-Colorectal cancer.



CELL CYCLE

G1

S

G2

M

Data on KEGG graph
Rendered by Pathview

TRANSSCRIPTIONAL MISREGULATION IN CANCER

TF: Transcription factor
Transcription factor fusion
5'-Partner 3'-Partner

<Cancers of haematopoietic and lymphoid tissues>

Acute myeloid leukemia (AML)

Mutation DNA → CSF1R MPO → Differentiation resistance
(TF) (TF)
Mutation DNA → CEBPA target genes → Differentiation resistance
(TF) (TF)
Mutation DNA → Per2 → Differentiation resistance
(TF) (TF)
Mutation DNA → CSF1R → Differentiation resistance
(TF) (TF)
Mutation DNA → PU1 → Differentiation resistance
(TF) (TF)
Mutation DNA → CD14 → Differentiation resistance
(TF) (TF)
Mutation DNA → CD11b → Differentiation resistance
(TF) (TF)
Mutation DNA → CD64 → Differentiation resistance
(TF) (TF)
Mutation DNA → Phoxk1 → Proliferation
(TF) (TF)
Mutation DNA → OcbnA1 → Proliferation, cell survival
(TF) (TF)
Mutation DNA → CEBPβ → Differentiation resistance
(TF) (TF)
Mutation DNA → Bcl-1A1 → Differentiation resistance
(TF) (TF)
Mutation DNA → FLZ → Differentiation resistance, proliferation
(TF) (TF)
Mutation DNA → RAS → Differentiation resistance, proliferation
(TF) (TF)
Mutation DNA → DUSP6 → Differentiation resistance, proliferation
(TF) (TF)

B lymphoblastic leukemia/lymphoma

q(1;19)(q23;p13) EJA → PBX1 → WNT-16 → Proliferation, cell survival
(TF) (TF)
q(12;21)(p12;q22) TEL → AML1 → IL-3 → Differentiation resistance
(TF) (TF) (TF) (TF)
q(8;21)(q22;q22) TEL → AML1 → IL-3 → Differentiation resistance
(TF) (TF) (TF) (TF)
HSC Transcription Factors LMW2 → PBX3 → Differentiation resistance
(TF) (TF)
Chromatin Regulators JMD1C → HMDA2 → Differentiation resistance
(TF) (TF)
Signaling Mediators PRDM1 → FLT3 → Differentiation resistance
(TF) (TF)
Cell Cycle Regulators CCND1B → PPYK1 → Resistance to chemotherapy
(TF) (TF)

T lymphoblastic leukemia/lymphoma

q(1;19)(q23;p13) ML1 → BHL → DNA → MED1 → HOXA9 → Differentiation resistance
(TF) (TF) (TF) (TF)
q(5;14)(q35;q24) TLX2 → DNA → SIDA → RYAL → CLRCNOC → Differentiation resistance
(TF) (TF) (TF) (TF)
q(10;14)(q24;q11), q(7;10)(q35;q24) TLX1 → DNA → Bcl11B → Differentiation resistance
(TF) (TF) (TF)
del(11)(p12p13), t(11;14)(p13;q11), q(7;10)(q35;p13) LMO2 → DNA → LDB1 → Self-renewal of T cells
(TF) (TF) (TF)
q(4;14)(p12;q32) E47 → DNA → pTc → Differentiation resistance
(TF) (TF)

Hodgkin's lymphoma

c-Rel → DNA → SCND2 → c-JAP2 → Proliferation, cell survival
(TF) (TF) (TF)

Hairy-cell leukemia

Mutation DNA → Bcl-6 → Proliferation, cell survival
(TF) (TF)

Multiple myeloma

q(4;16)(p12;q22) IgH → MAF → MYELOMA PROLIFERATION
(TF) (TF)
q(4;14)(p12;q32) IgH → ITOB1 → MYELOMA ADHESION TO BONE MARROW STROMA
(TF) (TF)

Lymphoplasmaic lymphoma

q(9;14)(p31;q32) IgH → DNA → PAX5 target genes → Proliferation
(TF) (TF)

<Epithelial cancers>

Follicular thyroid carcinoma

q(2;3)(q31;q25) RXR → Thyroid cancer
(TF) (TF)
PAX8 → PPARγ → Proliferation
(TF) (TF)

Papillary renal cell carcinoma

q(1;1)(p11;q21) PRCC → TP53 → p21 → Cell cycle delay
(TF) (TF)

Prostate cancer

del(21)(q22) TMPRSS2 → DNA → FLAU → PLAT → Cellular migration, invasion
(TF) (TF) (TF) (TF)
q(7;21)(p21;q22) TMPRSS2 → DNA → MMP → IL12 → Cellular migration, invasion
(TF) (TF) (TF) (TF)
q(17;21)(q21;q22) TMPRSS2 → DNA → SPINT1 → Cellular migration, invasion
(TF) (TF) (TF) (TF)
q(3;21)(p28;q22) TMPRSS2 → DNA → FLAU → MMP → Cellular invasion
(TF) (TF) (TF) (TF)
del(1)(q32) SLUG → ELK4 → Prostate cancer
(TF) (TF)

<Neuroendocrine cancers>

Neuroblastoma

Amplification DNA → MYCN → Max → Inhibition of apoptosis
(TF) (TF) (TF) (TF)
SP1 → DNA → TRKA → Inhibition of apoptosis
(TF) (TF) (TF) (TF)
Miz-1 → DNA → p27 → Proliferation?
(TF) (TF) (TF) (TF)

Carcinoid

Mutation DNA → MEN1 → TF → Proliferation?
(TF) (TF) (TF) (TF)

Ewing's sarcoma

t(11;22)(q24;q12) EWSR1 → FLI1 → Proliferation, cell survival
(TF) (TF) (TF) (TF)
q(21;22)(q22;q12) EWSR1 → ATF1 → Proliferation, cell survival
(TF) (TF) (TF) (TF)
q(7;22)(q22;q12) EWSR1 → EVI1 → Proliferation, cell survival
(TF) (TF) (TF) (TF)
q(7;22)(q21;q12) EWSR1 → EVI4 → Proliferation, cell survival
(TF) (TF) (TF) (TF)
q(2;22)(q33;q12) EWSR1 → PEV → Tumor growth, survival
(TF) (TF) (TF) (TF)

Clear-cell sarcoma

t(12;22)(q13;q12) EWSR1 → ATF1 → Tumor angiogenesis, growth
(TF) (TF) (TF) (TF)
ATM → Low radiosensitivity of tumor cells? → Survival, proliferation
(TF) (TF) (TF) (TF)

Desmoplastic small round-cell tumour

t(11;22)(p13;q12) EWSR1 → WT1 → Proliferation
(TF) (TF) (TF) (TF)
PDGF → IL28 → Tumor cell growth
(TF) (TF) (TF) (TF)
BAWF3 → Interaction with ECM, migration, invasion
(TF) (TF) (TF) (TF)
TALL1A → Proliferation, cell survival
(TF) (TF) (TF) (TF)

Extraskeletal myxoid chondrosarcoma

q(2;22)(q23;q11-q12) EWSR1 → NR4A3 → Target genes
(TF) (TF) (TF) (TF)
q(9;17)(q22;q11) EWSR1 → NR4A3 → Target genes
(TF) (TF) (TF) (TF)

Myosid liposarcoma

q(12;16)(p13;p11) FUS → DDIT3 → CEBPβ → IL6 → Proliferation and invasion?
(TF) (TF) (TF) (TF) (TF) (TF)
q(12;22)(q13;q12) FUS → DDIT3 → NFKB1 → IL8 → Proliferation
(TF) (TF) (TF) (TF) (TF) (TF)

Alveolar rhabdomyosarcoma

q(2;13)(p35;q14) PAX3 → PCMXA → FLI1 → Angiogenesis?
(TF) (TF) (TF) (TF) (TF) (TF)
q(1;13)(p31;q34) PAX3 → PCMXA → Angiogenesis?
(TF) (TF) (TF) (TF) (TF) (TF)

Synovial sarcoma

q(X;18)(p11;q11) SYT → SSX → COMB → Tumor cell growth
(TF) (TF) (TF) (TF) (TF) (TF)

Alveolar soft-part sarcoma

q(X;17)(p11;q25) ASP1 → TP53 → c-Met → Angiogenesis, proliferation, invasion, metastasis
(TF) (TF) (TF) (TF) (TF) (TF)

<The majority of human cancers>

Mutation DNA → p53 → GADD45 → Uncontrolled proliferation, increased survival, genomic instability
(TF) (TF) (TF) (TF)
p21 → GADD45 → Uncontrolled proliferation, increased survival, genomic instability
(TF) (TF) (TF) (TF)
p27 → GADD45 → Uncontrolled proliferation, increased survival, genomic instability
(TF) (TF) (TF) (TF)
pRB → POLK → Uncontrolled proliferation, increased survival, genomic instability
(TF) (TF) (TF) (TF)

**Data on KEGG graph
Rendered by Pathview**

[illegible]

F-Pathway 05235-PD-L1 expression and PD-1 checkpoint pathway in cancer .

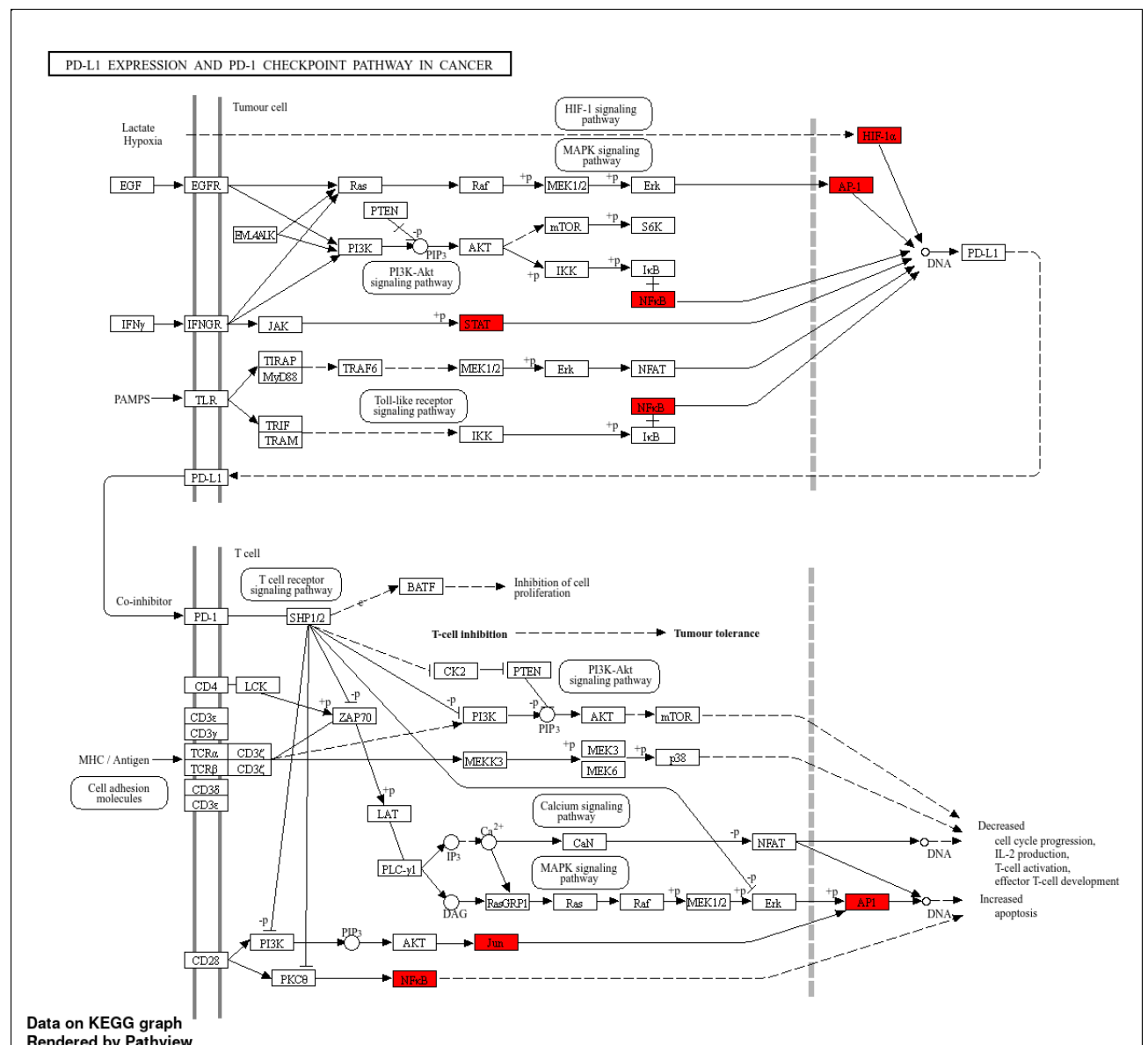


Figure S1-KEGG pathways that were used to build the model. A-Pathway 05200N-Pathways in cancer; B-Pathway 05210N- Colorectal cancer; C-Pathway 04100N-Cell cycle; D-Pathway 05202-Transcriptional misregulation in cancer; E-Pathway 04659-Th17 differentiation; F- Pathway 05235- PD-L1 expression and PD-1 checkpoint pathway in cancer [41,42]. In red-analyzed genes.