

Table S1. Description of the top 20 DEGs in young patients.

Gene	Description	Oncogenic relation
BCL2A1	BCL2 related protein A1	Anti-apoptotic effect, over-expressed in various cancers (Vogler 2012)
RGL4	Ral guanine nucleotide dissociation stimulator like 4	Related to Ras pathway activation (Leonardi et al. 2002)
FCGR1A	Fc gamma receptor 1a	Immune response regulation, over- expressed in various cancers (Xu and Guo 2020)
MT-RNR1	Mitochondrially encoded 12S rRNA	Mitochondrial activation. Possible association with oncogenesis (Ruiz-Heredia et al. 2021)
DYSF	Dysferlin	No data
CMT2	CKLF like MARVEL transmembrane domain containing 2	No data
ETS2	ETS proto-oncogene 2 transcription factor	Downstream effector of the RAS/RAF/ERK pathway (Fu et al. 2017)
PTX3	Pentraxin 3	Natural FGF antagonist, anti-angiogenic (Ronca et al. 2021)
DYSF	Dysferlin	No data
ITGAM	Integrin subunit alpha M	Encodes an integrin adhesion molecule (Tsao and Deng 2011). Might be associated with tumor immune regulation
PLAUR	Plasminogen activator, urokinase receptor	Role in cell survival and migration. Associated with glioma (Gilder et al. 2018)
ITGAM	Integrin subunit alpha M	Encodes an integrin adhesion molecule (Tsao and Deng 2011). Might be associated with tumor immune regulation
FCER1G	Fc epsilon receptor 1g	Immune regulation, the expression level of FCER1G is negatively correlated with myeloma progression (Fu et al. 2020)
TLR2	Toll like receptor 2	Inflammatory response, modulation of cell cycle, apoptosis, or regulation of cell metabolism. Associated with tumor formation (Akesolo et al. 2022),(Thakur et al. 2015)
FGR	FGR proto-oncogene, Src family tyrosine kinase	Proto-oncogene (Perez et al. 2022)
SCG5	Secretogranin V	No data
PGLYRP1	Ectonucleotide pyrophosphatase/ phosphodiesterase 3	Role in humoral immune response (Romanova et al. 2020)
ENPP3	Peptidoglycan recognition protein 1	Associated with renal cell carcinoma but no other oncogenic data is available (Thompson et al. 2018)
FUT7	Fucosyltransferase 7	Its role in e-selectin ligand synthesis has a possible relevance to tumor microenvironment regulation (Natoni et al. 2017)
UPP1	Uridine phosphorylase 1	Associated with brain glioma (Wang et al. 2020)
NTNG2	Netrin G2	Mutation and expression related to various cancer types (Hao et al. 2020)
PRAM1	PML-RARA regulated adaptor molecule 1	Regulated in normal myelogenesis, no oncologic relation except promyelocytic leukemia (Moog-Lutz et al. 2001)
FUT7	Fucosyltransferase 7	Its role in e-selectin ligand synthesis has a possible relevance to tumor microenvironment regulation (Natoni et al. 2017)
UPP1	Uridine phosphorylase 1	Associated with brain glioma (Wang et al. 2020)
NTNG2	Netrin G2	Mutation and expression related to various cancer types (Hao et al. 2020)

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Table S2. Gene-drug interaction analysis results.

Gene	Drug	Data source
BCL2A1	OBATOCLAX MESYLATE	ChemblInteractions
RGL4	TRAMADOL	PharmGKB
FCGR1A	MDX-447	ChemblInteractions NCI
	MDX-210	ChemblInteractions
	CEP-11981	DTC
MT-RNR1	GENTAMICIN	PharmGKB
-	NEOMYCIN	PharmGKB
-	KANAMYCIN	PharmGKB
-	STREPTOMYCIN	PharmGKB
-	TOBRAMYCIN	PharmGKB
-	AMIKACIN	PharmGKB
ETS2	GEMCITABINE	PharmGKB
	CARBOPLATIN	PharmGKB
ITGAM	ROVELIZUMAB	ChemblInteractions
-	CLARITHROMYCIN	NCI
-	HYDROCORTISONE	NCI
-	DIMETHYL SULFOXIDE	NCI
-	MORPHINE	NCI
-	THEOPHYLLINE	NCI
-	PHENYLEPHRINE	NCI
-	ATORVASTATIN	NCI
-	FENTANYL	NCI
-	LIARIZOLE	NCI
PLAUR	UROKINASE	TdgClinicalTrial
	FILGRASTIM	NCI
	RUXOLITINIB	TTD
FCER1G	ASPIRIN	PharmGKB
TLR2	TOMARALIMAB	TTD
-	DIAPEP-277	TdgClinicalTrial
-	CHEMBL1836411	DTC
-	RESVERATROL HEXANOIC ACID	DTC
FGR	TG100-801	ChemblInteractions
	NINTEDANIB	TALC
	DASATINIB	ChemblInteractions
	ENMD-981693	ChemblInteractions
	XL-228	ChemblInteractions
	ILORASERTIB	ChemblInteractions
SCG5	CAPSAICIN	NCI