**Supplementary Table S1**. Characteristics of the 22 genes found on chromosomes 14, 17, and 22.

| Gene symbol | Official full name | Function | Relationship with any kind of cancer | Gene alteration and others |
|---|---|---|---|---|
| ***TOX4*** | TOX high mobility group box family member 4 | *TOX4* is one of the regulatory factors of the PTW/PP1 phosphatase complex, which plays a role in the control of chromatin structure and cell cycle progression during the transition from mitosis into interphase. | Acute Mieloid Leukemia [1] | Overexpressed |
| | | | Breast cancer [2] | Overexpressed |
| | | | Lung cancer [2] | Underexpressed |
| | | | Kidney cancer [3] | Overexpressed |
| ***METTL3*** | Methyltransferase 3, N6-adenosine-methyltransferase complex catalytic subunit | The *METTL3-METTL14* heterodimer forms a N6-methyltransferase complex that methylates adenosine residues at the N(6) position of some RNAs and regulates various processes such as the circadian clock, differentiation of embryonic and hematopoietic stem cells, cortical neurogenesis, response to DNA damage, differentiation of T-cells and primary miRNA processing. | Acute myeloid leukemia [4,5] | Overexpressed |
| | | | Cervical cancer [6] | Overexpressed |
| | | | Colorectal cancer [7] | Overexpressed |
| | | | Bladder cancer [8] | Overexpressed |
| | | | Gastric cancer [9] | Overexpressed |
| | | | Prostate cancer [10] | Overexpressed |
| | | | Pancreatic cancer [11] | Overexpressed |
| | | | Ovarian cancer [12] | Overexpressed |
| | | | Esophageal cancer [13] | Overexpressed |
| | | | Gastrointestinal cancer [14] | Overexpressed |
| | | | Papillary thyroid cancer [15] | Underexpressed |
| ***RAB2B*** | | | Cervical cancer [16] | Overexpressed |

| Gene symbol | Official full name | Function | Relationship with any kind of cancer | Gene alteration and others |
| --- | --- | --- | --- | --- |
| | *RAB2B*, member *RAS* oncogene family | *RAB2B* is a member of the Rab protein family are non-transforming monomeric GTP-binding proteins of the Ras superfamily that contain four highly conserved regions involved in GTP binding and hydrolysis. *RAB2B* is required for protein transport from the endoplasmic reticulum to the Golgi complex. | Pancreatic cancer [17] | Overexpressed |
| ***SALL2*** | Spalt like transcription factor 2 | *SALL2* encodes a protein containing multiple zinc finger domains, which belongs to transcription factors (TFs), which are master regulators of gene expression and can control transcriptional production and, as a result, the proliferative or differentiated phenotype of the cell. *SALL2* has been mainly involved in optical fissure closure during the development of the eye in the embryo. | Acute lymphoblastic leukemia [18] | Frequent fusion-*TRA-SALL2* |
| | | | Acute myeloid leukemia [19] | Underexpressed |
| | | | Esophageal cancer [20] | Overexpressed |
| | | | Breast cancer [21] | Underexpressed |
| | | | Testicular cancer [22] | Overexpressed |
| | | | Oral Squamous Carcinomas [23] | Underexpressed |
| | | | Glioblastoma [24] | Overexpressed |
| | | | Ovarian carcinoma [25] | Underexpressed |
| ***OR10G3*** | Olfactory receptor family 10 subfamily G member 3 | *OR10G3* belongs to the olfactory receptor proteins are members of a large family of G protein-coupled receptors (GPCRs) that arise from single-exon coding genes. Olfactory receptors are responsible for G protein-mediated recognition and transduction of odor signals. | None | None |
| ***TRAV1-1*** | Receptor de células T alfa variable 1-1 | This gene forms part of the alpha chain of the TCR of lymphocytes. | Breast cancer [26] | High frequency |

| Gene symbol | Official full name | Function | Relationship with any kind of cancer | Gene alteration and others |
|---|---|---|---|---|
| ***FKBP10*** | FKBP prolil isomerasa 10 | The protein encoded by this gene belongs to the FKBP-type peptidyl-prolyl cis/trans isomerase (PPIase) family. This protein localizes to the endoplasmic reticulum and acts as a molecular chaperone. It has also been identified as FKBP65 and has a high binding affinity for the immunosuppressant drugs cyclosporin A (CsA) and FK506. | Leukemia [27] | K562 cells-Adriamycin resistance |
| | | | Stomach cancer [28] | Overexpressed |
| | | | Gastric cancer [29] | Overexpressed |
| | | | Lung cancer [30] | Overexpressed |
| | | | Renal cancer [31] | Overexpressed |
| | | | Glioma [32] | Overexpressed |
| | | | Ovarian cancer [33] | Underexpressed |
| | | | Breast cancer [34] | Overexpressed |
| ***P3H4*** | prolyl 3-hydroxylase family member 4 | *P3H4* translates the nucleolar protein first characterized as an autoantigen in cases of interstitial cystitis. Together with PLOD1, P3H3 forms a complex that catalyzes the hydroxylation of lysine residues in collagen alpha chains and is required to assemble and normally crosslink collagen fibrils. Required for normal bone density and normal skin stability through its role in the hydroxylation of lysine residues in collagen alpha chains and collagen fibril assembly. | Bladder cancer [35] | Overexpressed |
| | | | Lung cancer [36] | Overexpressed |
| | | | Renal cancer[37] | Underexpressed |
| ***DNAJC7*** | DnaJ heat shock protein family (Hsp40) member C7 | This gene encodes a member of the DNAJ heat shock protein 40 family. This protein binds the chaperone heat shock proteins 70 and 90 in an ATP-dependent manner and may function as a co-chaperone. Pseudogenes of this gene are found on chromosomes 1 and 6. | Kidney cancer [38] | Overexpressed |
| ***NT5C3B*** | 5'-nucleotidase, cytosolic IIIB | *NT5C3B* translates the enzyme 5'-nucleotidase, cytosolic IIIB, which catalyzes dephosphorylation of 7-methylguanosine | None | None |

| Gene symbol | Official full name | Function | Relationship with any kind of cancer | Gene alteration and others |
|---|---|---|---|---|
| | | monophosphate (m7GMP) released during mRNA turnover. The specific activity for m(7)GMP may protect cells against undesired salvage of m(7)GMP and its incorporation into nucleic acids. | | |
| ***CNP*** | 2',3'-cyclic nucleotide 3' phosphodiesterase | *CNP* translates to enable 2',3'-cyclic-nucleotide 3'-phosphodiesterase activity. This CNPase is a membrane-bound enzyme found at high concentrations in central nervous system myelin and in the outer segments of photoreceptors in the retina that may participate in RNA metabolism in the myelinating cell. Two proteins with CNP activity exist in the brain and lymphoid tissues. | Glioblastoma [39] | Overexpressed |
| ***ACLY*** | ATP citrate lyase | In many tissues, ATP citrate lyase is the primary enzyme for synthesizing cytosolic acetyl-CoA. It catalyzes the formation of acetyl-CoA and oxaloacetate from citrate and CoA with concomitant hydrolysis of ATP to ADP and phosphate. Acetyl-CoA serves several critical biosynthetic pathways, including lipogenesis and cholesterogenesis. In nervous tissue, ATP citrate-lyase may be involved in the biosynthesis of acetylcholine. | Acute myeloid leukemia [40] | Overexpressed |
| | | | Prostate cancer [41] | Overexpressed |
| | | | Colon cancer [42] | Overexpressed |
| | | | Breast cancer [43] | Overexpressed |
| | | | Esophageal cancer [44] | Overexpressed |
| | | | Lung cancer [45] | Overexpressed |
| | | | Ovarian Cancer [46] | Overexpressed |
| | | | Endometrial cancer [47] | Overexpressed |
| | | | Thyroid cancer [48] | Overexpressed |
| | | | Hepatocellular carcinoma [49,50] | Overexpressed |

| Gene symbol | Official full name | Function | Relationship with any kind of cancer | Gene alteration and others |
| --- | --- | --- | --- | --- |
| | | | Head and Neck Squamous Cell Carcinomas [51] | Radiosensitivity |
| ***JUP*** | Junction plakoglobin | This gene encodes a major cytoplasmic protein which is the only known constituent common to submembranous plaques of both desmosomes and intermediate junctions. This protein forms distinct complexes with cadherins and desmosomal cadherins and is a member of the catenin family since it contains a distinct repeating amino acid motif called the armadillo repeat [52] | Acute lymphoblastic leukemia [53] | Overexpressed |
| | | | Acute Mieloid Leukemia [54] | Overexpressed |
| | | | Ovarian cancer [55] | Overexpressed |
| | | | Gastric cancer [52] | Underexpressed |
| | | | Prostate cancer [56] | Overexpressed or underexpressed in different stages of disease |
| | | | Lung cancer [56,57] | Underexpressed |
| | | | Breast cancer [58,59] | Overexpressed |
| | | | Oral squamous cell carcinoma [60] | Overexpressed |
| | | | Colorectal cancer [61] | Overexpressed |
| ***KLHL10*** | Kelch like family member 10 | The protein encoded by this gene belongs to the kelch repeat-containing family and contains an N-terminal BTB/POZ domain, a BACK domain, and six C-terminal kelch repeats. It may be a substrate-specific adapter of a CUL3-based E3 ubiquitin-protein ligase complex which mediates the ubiquitination and subsequent proteasomal degradation of target proteins during spermatogenesis. | None | None |
| ***KLHL11*** | Kelch like family member 11 | KLHL11 translates the Component of a cullin-RING-based BCR (BTB-CUL3-RBX1) | None | None |

| Gene symbol | Official full name | Function | Relationship with any kind of cancer | Gene alteration and others |
|---|---|---|---|---|
| | | E3 ubiquitin-protein ligase complex that mediates the ubiquitination of target proteins, leading most often to their proteasomal degradation. | | |
| ***TTC25-ODAD4*** | Outer dynein arm docking complex subunit 4 | This gene encodes a tetratricopeptide repeat domain-containing protein that localizes to ciliary axonmenes and plays a role in docking the outer dynein arm to cilia. | None | None |
| ***RTL10-C22orf29*** | Retrotransposon Gag like 10 | The protein translates for *RTL10- C22orf29*, which could induce apoptosis in a BH3 domain-dependent manner. This gene is also involved in mitochondrial outer membrane permeabilization and regulation of mitochondrial membrane potential. | Acute chronic leukemia [62] | Overexpressed |
| ***TXNRD2*** | Thioredoxin reductase 2 | The protein encoded by this gene belongs to the pyridine nucleotide-disulfide oxidoreductase family, and is a member of the thioredoxin (Trx) system. Three thioredoxin reductase (TrxR) isozymes are found in mammals. TrxRs are selenocysteine-containing flavoenzymes, which reduce thioredoxins, and other substrates, and play a key role in redox homeostasis. | Acute chronic leukemia [63] | Underexpressed |
| | | | Breast cancer [64] | Overexpressed |
| | | | Mieloma [65] | Overexpressed |
| ***COMT*** | Catechol-O-methyltransferase | *COMT* translates Catechol-O-methyltransferase that catalyzes the transfer of a methyl group from S-adenosylmethionine to catecholamines, | Acute lymphoblastic leukemia [66] | Variant rs4680 associated with patients who experienced hepatotoxicity |

| Gene symbol | Official full name | Function | Relationship with any kind of cancer | Gene alteration and others |
|---|---|---|---|---|
| | | including the neurotransmitters dopamine, epinephrine, and norepinephrine. This O-methylation results in one of the major degradative pathways of the catecholamine transmitters. | Prostate cancer [67] | Underexpressed |
| ***ARVCF*** | ARVCF delta catenin family member | Armadillo Repeat gene deleted in Velo-Cardio-Facial syndrome (*ARVCF*) is a catenin family member. This family plays an essential role in forming adherens junction complexes, which are thought to facilitate communication between the inside and outside environments of the cell. | Non-small cell lung cancer [68] | Overexpressed |
| | | | Prostate Cancer [69] | Correlation of SNP "rs5993891" with prostate patients |
| | | | Ranal Cancer [70] | Overexpressed |
| ***GNB1L*** | G protein subunit beta 1 like | This gene encodes a G-protein beta-subunit-like polypeptide, a member of the WD repeat protein family. WD repeats are minimally conserved regions of approximately 40 amino acids typically bracketed by gly-his and trp-asp (GH-WD), which may facilitate the formation of heterotrimeric or multiprotein complexes. Members of this family are involved in a variety of cellular processes, including cell cycle progression, signal transduction, apoptosis, and gene regulation. | Hepatocellular Carcinomas [71] | High frequencies of somatic copy number variation (CNV) |
| ***TANGO2*** | Transport and golgi organization 2 homolog | This gene belongs to the transport and Golgi organization family, whose members are predicted to play roles in secretory protein loading in the endoplasmic reticulum. | Prostate cancer [72] | Overexpressed |

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