

Supplementary table 1 Resuming the genes identified *in silico* after the cytogenetic characterization of the clonal rearrangements found in CLS-ACI-1 cell line; it's homologous in the human counterpart (HSA); the biological processes in which each gene is involved; the respective qualifier, evidence and RGD ID.

RNO		HSA					
Breakpoint region	Gene	Homolog Gene	Cytogenetic position	Biological Process	Qualifier	Evidence	RGD ID
1q55	<i>Mxi1</i>	<i>MXI1</i> (<i>MAX interactor 1, dimerization protein</i>)	10q24-q25	Cytoplasmic sequestering of transcription factor, Negative regulation of cell proliferation, Negative regulation of transcription from RNA polymerase II promoter, Transcription, DNA-templated	—	IAGP	3128
3q11	<i>Hspa5</i>	<i>HSPA5</i> (<i>heat shock protein 5</i>)	9q33.3	Activation of signaling protein activity involved in unfolded protein response, cellular response to interleukin-4, negative regulation of apoptotic process, negative regulation of transforming growth factor beta receptor signaling pathway, cellular protein metabolic process, response to antibiotic, cellular response to glucose starvation, positive regulation of transcription from RNA polymerase II promoter in response to endoplasmic reticulum stress	—	ISS	2843
	<i>Ptgs1</i>	<i>PTGS1</i> (<i>prostaglandin-endoperoxide synthase 1</i>)	9q32-q33.3	Prostaglandin biosynthetic process, Cyclooxygenase pathway, Regulation of cell proliferation, Inflammatory response, Lipid metabolic process, Response to oxidative stress	—	ISS	3439
3q31	<i>Cd82</i>	<i>CD82</i> (<i>CD82 molecule</i>)	11p11.2	Expression of this gene has been shown to be downregulated in tumor progression of human cancers and can be activated by p53 through a consensus binding sequence in the promoter. Its expression and that of p53 are strongly correlated, and the loss of expression of these two proteins is associated with poor survival for prostate cancer patients.	—	ISS	69070
3q35	<i>Rad51</i>	<i>RAD51</i> (<i>RAD51 recombinase</i>)	15q15.1	Cellular response to DNA damage stimulus, DNA recombinase assembly, DNA repair, DNA unwinding involved in DNA replication, Double-strand break repair via homologous recombination, Meiotic nuclear division, Mitotic recombination, Positive regulation of DNA ligation	Resistance; Susceptibility	ISS	1563603
	<i>Spint1</i>	<i>SPINT1</i> (<i>serine peptidase inhibitor, Kunitz type 1</i>)	15q15.1	Branching involved in labyrinthine layer morphogenesis, extracellular matrix organization, negative regulation of endopeptidase activity, placenta blood vessel development	—	—	1303138
3q36	<i>Cdc25b</i>	<i>CDC25B</i> (<i>cell division cycle 25B</i>)	20p13	Cell division, G2/M transition of mitotic cell cycle, Mitotic cell cycle, Mitotic nuclear division, Positive regulation of cell proliferation, Positive regulation of cytokinesis, Positive regulation of mitotic cell cycle, Positive regulation of protein kinase activity	Disease_progression	ISS	621500

3q36	<i>Il1b</i>	<i>IL1B (interleukin 1, beta)</i>	2q14	Activation of MAPK activity, Apoptotic process, Cell-cell signaling, Cellular response to drug, Immune response, Inflammatory response, MAPK cascade, Negative regulation of cell proliferation, Positive regulation of angiogenesis, Positive regulation of gene expression, Positive regulation of I-kappaB kinase/NF-kappaB signaling, Positive regulation of JNK cascade, Positive regulation of mitotic nuclear division, Positive regulation of transcription, Positive regulation of transcription from RNA polymerase II promoter, cytokine-mediated signaling pathway, interleukin-1 beta production, positive regulation of angiogenesis, negative regulation of glucose transport, positive regulation of gene expression, negative regulation of lipid metabolic process negative regulation of MAP kinase activity, negative regulation of insulin receptor signaling pathway, protein kinase B signaling	—	ISS	2891
	<i>Pcna</i>	<i>PCNA (proliferating cell nuclear antigen)</i>	20p12	Cell proliferation, DNA repair, DNA strand elongation involved in DNA replication, G1/S transition of mitotic cell cycle, Mitotic cell cycle, Regulation of DNA replication, Telomere maintenance, regulation of transcription involved in G1/S transition of mitotic cell cycle	Disease_progression	ISS	3269
5q36	<i>Casp9</i>	<i>CASP9 (caspase 9, apoptosis-related cysteine peptidase)</i>	1p36.21	Apoptotic process, Apoptotic signaling pathway, Cellular response to DNA damage stimulus, Fibroblast growth factor receptor signaling pathway, Intrinsic apoptotic signaling pathway in response to DNA damage, Positive regulation of apoptotic process, Regulation of response to DNA damage stimulus, Signal transduction in response to DNA damage, response to antibiotic, response to estradiol, cellular response to UV, aging, innate immune response	—	ISS	61867
	<i>Hdac1</i>	<i>HDAC1 (histone deacetylase 1)</i>	1p34	Chromatin modification, chromatin organization, chromatin remodeling, Gene expression, Histone deacetylation, Mitotic cell cycle, negative regulation of cell cycle transcription, DNA-templated, negative regulation of transcription, DNA-templated, protein deacetylationNegative regulation of apoptotic process, Negative regulation of gene expression, epigenetic, Notch signaling pathway, Positive regulation of cell proliferation, Positive regulation of transcription from RNA polymerase II promoter, Regulation of gene expression, epigenetic, Viral process	—	ISS	1309799
	<i>Plk3</i>	<i>PLK3 (polo-like kinase 3)</i>	1p34.1	Apoptotic process, Cellular response to DNA damage stimulus, Mitotic cell cycle checkpoint, Mitotic G1/S transition checkpoint, Negative regulation of transcription from RNA polymerase II promoter, Regulation of cell division	Disease_progression	ISS	62039
	<i>Runx3</i>	<i>RUNX3 (runt-related transcription factor 3)</i>	1p36	Cell maturation, Negative regulation of cell cycle, Negative regulation of epithelial cell proliferation, Positive regulation of extrinsic apoptotic signaling pathway, Regulation of	Disease_progression —	ISS ISS	620082

5q36				transcription, DNA-templated, Transcription from RNA polymerase II promoter			
	<i>Sfn</i>	<i>SFN (stratifin)</i>	1p36.11	Apoptotic process, establishment of skin barrier, intrinsic apoptotic signaling pathway, intrinsic apoptotic signaling pathway in response to DNA damage, negative regulation of cell proliferation, negative regulation of cysteine-type endopeptidase activity involved in apoptotic process, negative regulation of protein kinase activity, negative regulation of protein serine/threonine kinase activity, positive regulation of cell growth, regulation of cyclin-dependent protein serine/threonine kinase activity, regulation of epidermal cell division, release of cytochrome c from mitochondria, signal transduction	–	ISS	1304729
	<i>Tp73</i>	<i>TP73 (tumor protein p73)</i>	1p36.3	Activation of MAPK activity, Cell cycle arrest, DNA damage response, signal transduction by p53 class mediator resulting in transcription of p21 class mediator, Inflammatory response, Intrinsic apoptotic signaling pathway in response to DNA damage by p53 class mediator, Mitotic G1 DNA damage checkpoint, Negative regulation of JUN kinase activity, Positive regulation of transcription, DNA-templated, Positive regulation of transcription from RNA polymerase II promoter, Regulation of gene expression, Regulation of mitotic cell cycle, Transcription from RNA polymerase II promoter	Disease_progression	ISS	1307083
	<i>Urod</i>	<i>UROD (uroporphyrinogen decarboxylase)</i>	1p34	Heme biosynthetic process, Porphyrin-containing compound metabolic process, Protoporphyrinogen IX biosynthetic process, Small molecule metabolic process	–	ISS	3946
6q11	<i>Cyp1b1</i>	<i>CYP1B1 (cytochrome P450, family 1, subfamily b, polypeptide 1)</i>	2p22.2	Angiogenesis, endothelial cell migration, endothelial cell-cell adhesion, intrinsic apoptotic signaling pathway in response to oxidative stress, negative regulation of NF-kappaB transcription factor activity, negative regulation of cell adhesion mediated by integrin, negative regulation of cell migration, negative regulation of cell proliferation, positive regulation of JAK-STAT cascade, positive regulation of apoptotic process, steroid metabolic process, xenobiotic metabolic process	–	IEP	2460
					Susceptibility	ISS	
6q12	<i>Msh2</i>	<i>MSH2 (mutS homolog 2)</i>	2p21	Cell cycle arrest, DNA repair, Intra-S DNA damage checkpoint, Intrinsic apoptotic signaling pathway in response to DNA damage by p53 class mediator, Maintenance of DNA repeat elements, Mismatch repair, Negative regulation of DNA	Disease_progression; Severity; Susceptibility	ISS	620786
6q13	<i>Lhcgr</i>	<i>LHCGR (luteinizing hormone/choriogonadotropin receptor)</i>	2p21	Activation of adenylate cyclase activity, adenylate cyclase-activating G-protein coupled receptor signaling pathway, cellular response to gonadotropin stimulus, hormone-mediated signaling pathway, luteinizing hormone signaling pathway, phospholipase C-activating G-protein coupled receptor signaling pathway, positive regulation of cAMP-mediated signaling, positive regulation of inositol trisphosphate biosynthetic process	Severity	ISS	3007

6q16	<i>Rhob</i>	<i>RHOB (ras homolog family member B)</i>	2p24	Angiogenesis, apoptotic process, cell adhesion, cytokinesis, intracellular protein transport, negative regulation of cell cycle, positive regulation of angiogenesis, positive regulation of apoptotic process, regulation of small GTPase mediated signal transduction, Rho protein signal transduction, transformed cell apoptotic process	Severity	ISS	621309
6q24	<i>Esr2</i>	<i>ESR2 (estrogen receptor 2 (ER beta))</i>	14q23.2	Cell-cell signaling, Gene expression, Hormone-mediated apoptotic signaling pathway, Intracellular estrogen receptor signaling pathway, Negative regulation of cell growth, Negative regulation of epithelial cell proliferation, Regulation of transcription, DNA-templated, Signal transduction	Treatment	IED	2582
	<i>Hif1a</i>	<i>HIF1A (hypoxia-inducible factor 1, alpha subunit (basic helix-loop-helix transcription factor))</i>	14q23.2	Cell-cell signaling, Gene expression, Hormone-mediated apoptotic signaling pathway, Negative regulation of cell growth, Negative regulation of epithelial cell proliferation, Regulation of transcription, DNA-templated, Signal transduction	Disease_progression; Susceptibility; Treatment	ISS	
6q31	<i>Pgf</i>	<i>PGF (placental growth factor)</i>	14q24.3	Cell-cell signaling, Cell differentiation, Cellular response to hormone stimulus, Positive regulation of angiogenesis, Positive regulation of cell division, Positive regulation cell proliferation, Response to drug, Signal transduction	Disease_progression	ISS	619850
9q32	<i>ErbB4</i>	<i>ERBB4 (v-erb-b2 avian erythroblastic leukemia viral oncogene 4)</i>	2q33.3-q34	Cell proliferation, Negative regulation of apoptotic process, Negative regulation of cell proliferation, Neurotrophin TRK receptor signaling pathway, Positive regulation of cell proliferation, Positive regulation of ERK1 and ERK2 cascade, Positive regulation of STAT protein import into nucleus, Positive regulation of tyrosine phosphorylation of Stat5 protein, Regulation of cell migration, Signal transduction, Transcription, DNA-templated	Disease_progression; Susceptibility	ISS	620486
	<i>Ctla4</i>	<i>CTLA4 (cytotoxic T-lymphocyte-associated protein 4)</i>	2q33	B cell receptor signaling pathway, cellular response to DNA damage stimulus, immune response, negative regulation B cell proliferation, negative regulation immune response, negative regulation of regulatory T cell differentiation, negative regulation of T cell proliferation, positive regulation of apoptotic process	-	ISS	61975
10q31	<i>Brcal</i>	<i>BRCA1 (breast cancer 1, early onset)</i>	17q21	Apoptotic process, Cellular response to DNA damage stimulus, Cellular response to tumor necrosis factor, Centrosome cycle, Chromosome segregation, DNA damage response, signal transduction by p53 class mediator resulting in transcription of p21 class mediator, DNA repair, DNA replication, Fatty acid biosynthetic process, G2 DNA damage checkpoint, Intrinsic apoptotic signaling pathway in response to DNA damage, Negative regulation of histone acetylation, Negative regulation of transcription, DNA-templated, Positive regulation of angiogenesis, Positive regulation of cell cycle arrest, Positive regulation of DNA repair, Positive regulation of gene expression, Positive regulation of histone acetylation, Regulation of apoptotic process, Regulation of cell proliferation, Regulation of DNA methylation, Regulation of gene expression	Disease_progression; Susceptibility	ISS	2218

10q31				by genetic imprinting, Regulation of transcription from RNA polymerase II promoter			
	<i>Hsd17b1</i>	<i>HSD17B1 (hydroxysteroid (17-beta) dehydrogenase 1)</i>	17q11-q21	Lipid biosynthesis, Lipid metabolism, Steroid biosynthesis	Severity	ISS	2836
	<i>Jup</i>	<i>JUP (junction plakoglobin)</i>	17q21	Adherens junction assembly, Cell-cell junction organization, Cell junction assembly, Cell migration, Cytoskeletal anchoring at plasma membrane, Positive regulation of canonical Wnt signaling pathway, Positive regulation of protein import into nucleus, Regulation of cell proliferation, Single organismal cell-cell adhesion, positive regulation of sequence-specific DNA binding transcription factor activity	No_Association	ISS	620412
					Severity	ISS	
	<i>Stat3</i>	<i>STAT3 (signal transducer and activator of transcription 3 (acute-phase response factor))</i>	17q21.31	Cell proliferation, Cytokine-mediated signaling pathway, Growth hormone receptor signaling pathway, Intracellular receptor signaling pathway, JAK-STAT cascade, Negative regulation of cell death, Negative regulation of cell proliferation, Negative regulation of transcription from RNA polymerase II promoter, Positive regulation of Notch signaling pathway, Regulation of transcription, DNA-templated, Response to drug, Signal transduction, Somatic stem cell maintenance, Viral process	Susceptibility	ISS	3772
12p11	<i>Flt1</i>	<i>FLT1 (FMS-related tyrosine kinase 1)</i>	13q12.3	Cell differentiation, cell migration, positive regulation of angiogenesis, positive regulation of cell migration, positive regulation of cell proliferation, positive regulation of MAPK cascade, positive regulation of MAP kinase activity, positive regulation phosphatidylinositol 3-kinase signaling, positive regulation of vascular endothelial growth factor receptor signaling pathway, transmembrane receptor protein tyrosine kinase signaling pathway, vascular endothelial growth factor receptor-1 signaling pathway	–	IEP	2621
					Severity	ISS	
	<i>Alox5ap</i>	<i>ALOX5AP (arachidonate 5-lipoxygenase-activating protein)</i>	13q12	Arachidonic acid metabolic process, cellular response to calcium ion, leukotriene biosynthetic process, leukotriene metabolic process, lipoxin metabolic process, lipoxygenase pathway, protein homotrimerization, small molecule metabolic process	–	ISS	2097
12q11	<i>Pms2</i>	<i>PMS2 (postmeiotic segregation increased 2 (S. cerevisiae))</i>	7p22.2	DNA repair, mismatch repair, nucleic acid phosphodiester bond hydrolysis, response to drug, somatic hypermutation of immunoglobulin genes, somatic recombination immunoglobulin gene segments	–	ISS	1305483

12q11	<i>Pdgfa</i>	<i>PDGFA (platelet-derived growth factor alpha polypeptide)</i>	7p22	Actin cytoskeleton organization, angiogenesis, cell activation, cell-cell signaling, fibroblast growth factor receptor signaling pathway, innate immune response, neurotrophin TRK receptor signaling pathway, positive regulation of cell division, positive regulation of cell migration, positive regulation of cell proliferation, positive regulation of DNA replication, positive regulation of ERK1 and ERK2 cascade, positive regulation of fibroblast proliferation, positive regulation of MAPK cascade, positive regulation of MAP kinase activity, positive regulation of protein kinase B signaling, regulation of actin cytoskeleton organization, response to drug, response to estradiol, response to retinoic acid, transforming growth factor beta receptor signaling pathway	—	ISS	3282
12q12	<i>Serpine1</i>	<i>SERPINE1 (serpin peptidase inhibitor, clade E (nexin, plasminogen activator inhibitor type 1), member 1)</i>	7q22.1	Angiogenesis, gene expression, negative regulation of cell adhesion mediated by integrin, negative regulation of cell migration, negative regulation of endothelial cell apoptotic process, negative regulation of extrinsic apoptotic signaling pathway via death domain receptors, positive regulation of angiogenesis, positive regulation of inflammatory response, positive regulation of leukotriene production involved in inflammatory response, positive regulation of transcription from RNA polymerase II promoter, regulation of cell proliferation, transcription, DNA-templated, transcription initiation from RNA polymerase II promoter	—	ISS	3249
14q21	<i>Fgfr3</i>	<i>FGFR3 (fibroblast growth factor receptor 3)</i>	4p16.3	Cell-cell signaling, Fibroblast growth factor receptor apoptotic signaling pathway, Innate immune response, Inner ear receptor cell differentiation, JAK-STAT cascade, MAPK cascade, Negative regulation of epithelial cell proliferation, Negative regulation of transcription from RNA polymerase II promoter, Positive regulation of canonical Wnt signaling pathway, Positive regulation of cell proliferation, Positive regulation of ERK1 and ERK2 cascade, Positive regulation of tyrosine phosphorylation of Stat3 protein, Somatic stem cell maintenance	—	ISS	620714
					No_Association	ISS	
	<i>Igfbp1</i>	<i>IGFBP1 (insulin-like growth factor binding protein 1)</i>	7p13-p12	Positive regulation of cell growth signal transduction, tissue regeneration	—	ISS	2872
					No_Association	ISS	
	<i>Igfbp3</i>	<i>IGFBP3 (insulin-like growth factor binding protein 3)</i>	7p13-p12	Apoptotic process, Negative regulation of cell proliferation, Positive regulation of apoptotic process, Positive regulation of MAPK cascade, Regulation of cell growth	—	ISS	2874
					No_Association	ISS	

14q21	<i>Thoc5</i>	<i>THOC5 (THO complex 5)</i>	22q12.2	Cell proliferation, Cellular response to drug, Innate immune response, MAPK cascade, Negative regulation of apoptotic process, Negative regulation of mitotic cell cycle, Positive regulation of cell proliferation, Positive regulation of DNA repair, Positive regulation of DNA replication, Positive regulation of transcription from RNA polymerase II promoter, cellular response to estradiol stimulus, positive regulation of cell migration, positive regulation of ERK1 and ERK2 cascade, positive regulation of fibroblast proliferation, positive regulation of inflammatory response, positive regulation of MAP kinase activity, response to stress, response to UV-A, Signal transduction, Single organismal cell-cell adhesion, Translation	—	ISS	1304991
14q22	<i>Egfr</i>	<i>EGFR (epidermal growth factor receptor)</i>	7p12	MAPK cascade, cell proliferation, cell surface receptor signaling pathway, cellular response to drug, cellular response to epidermal growth factor stimulus, fibroblast growth factor receptor signaling pathway, negative regulation apoptotic process, negative regulation of epidermal growth factor receptor signaling pathway, negative regulation of mitotic cell cycle, positive regulation of DNA repair, positive regulation of DNA replication, positive regulation of ERK1 and ERK2 cascade, positive regulation of MAP kinase activity, positive regulation of cell migration, positive regulation cell proliferation, positive regulation of cyclin-dependent protein serine/ threonine kinase activity involved in G1/S transition of mitotic cell cycle, positive regulation of epithelial cell proliferation, positive regulation of fibroblast proliferation, positive regulation of inflammatory response, positive regulation of protein kinase B signaling, positive regulation of protein phosphorylation, response to UV-A, response to stress, signal transduction	Disease_progression	ISS	2543
	<i>Rel</i>	<i>REL (v-rel avian reticuloendotheliosis viral oncogene homolog)</i>	2p13-p12	I-kappaB kinase/NF-kappaB signaling, Inflammatory response, Innate immune response, Negative regulation of transcription from RNA polymerase II promoter, Positive regulation of transcription from RNA polymerase II promoter	—	ISS	1311231
20p12	<i>Cfb</i>	<i>CFB (complement factor B)</i>	6p21.3	Complement alternate pathway, Immunity and Innate immunity	Treatment	ISS	2204
	<i>Gstt1</i>	<i>GSTT1 (glutathione S-transferase theta 1)</i>	22q11.23	Response to drug, glutathione metabolic process oxidation-reduction process, small molecule metabolic process, Xenobiotic metabolic process	Susceptibility	ISS	2765
	<i>Lta</i>	<i>LTA (lymphotoxin alfa)</i>	6p21.3	Apoptotic process, cell-cell signaling, Positive regulation of apoptotic process, Negative regulation of fibroblast proliferation, Response to drug, Signal transduction	Susceptibility	ISS	3020
	<i>RT1-Ba</i> <i>RT1 class II locus Ba</i>	<i>HLA-DQA1 (major histocompatibility complex, class II, DQ alpha 1)</i>	6p21.3	Cytokine-mediated signaling pathway, immune response, interferon-gamma-mediated signaling pathway, T cell receptor signaling pathway	—	ISS	1595867

20p12	<i>RT1-Db1</i> <i>RT1 class II locus Db1</i>	<i>HLA-DRB5 (major histocompatibility complex, class II, DR beta 5)</i>	6p21.3	T cell costimulation, T cell receptor signaling pathway, cytokine-mediated signaling pathway, antigen processing and presentation of exogenous peptide antigen via MHC class II			1593282
	<i>Tff1</i>	<i>TFF1 (trefoil factor 1)</i>	21q22.3	Cell differentiation, negative regulation of cell proliferation, response to estradiol	Disease_progression	ISS	620707
	<i>Tnf</i>	<i>TNF (tumor necrosis factor)</i>	6p21.3	JNK cascade, MAPK cascade, activation of MAPK activity, activation of MAPKKK activity, activation of cysteine-type endopeptidase activity involved in apoptotic process, apoptotic process, apoptotic signaling pathway, cell activation, extrinsic apoptotic signaling pathway, extrinsic apoptotic signaling pathway via death domain receptors, inflammatory response, intrinsic apoptotic signaling pathway in response to DNA damage, negative regulation of cell proliferation, negative regulation of cytokine secretion involved in immune response, negative regulation of extrinsic apoptotic signaling pathway in absence of ligand, negative regulation of fat cell differentiation, negative regulation of gene expression, negative regulation of glucose import, negative regulation of interleukin-6 production, negative regulation of transcription from RNA polymerase II promoter, negative regulation of transcription DNA-templated, positive regulation of ERK1 and ERK2 cascade, positive regulation of I-kappaB kinase/NF-kappaB signaling, positive regulation of JNK cascade, positive regulation of JUN kinase activity, positive regulation of MAP kinase activity, positive regulation of NF-kappaB import into nucleus, positive regulation of NF-kappaB transcription factor activity, positive regulation of NFAT protein import into nucleus, positive regulation of apoptotic process, positive regulation of cytokine production, positive regulation of extrinsic apoptotic signaling pathway via death domain receptors, positive regulation of gene expression, positive regulation of interleukin-6 production, positive regulation of interleukin-8 biosynthetic process, positive regulation of mitosis, positive regulation of programmed cell death, positive regulation of protein kinase B signaling, positive regulation of protein phosphorylation, positive regulation of sequence-specific DNA binding transcription factor activity, positive regulation of transcription from RNA polymerase II promoter, positive regulation of transcription DNA-templated, protein import into nucleus, translocation, protein kinase B signaling, regulation of I-kappaB kinase/NF-kappaB signaling, response to drug, transformed cell apoptotic process, tumor necrosis factor-mediated signaling pathway	Susceptibility	ISS	3876

Abbreviations: (IAGP) inferred by association of genotype and phenotype; (IED) inferred from experimental data; (IEP) inferred from expression pattern; (ISS) inferred from sequence or structural similarity; (RGD ID) rat genome database identifier