Table 1. The 20 SPTB biomarker genes with the summaries of their functions

Gene symbol	Gene name	Gene functions
ASRGL1	Asparaginase And Isoaspartyl Peptidase 1	• Diseases associated with ASRGL1 include Telogen Effluvium and Masa Syndrome. Among its related pathways are Histidine, lysine, phenylalanine, tyrosine, proline and tryptophan catabolism and Metabolism [1].
CDKN2A-DT	CDKN2A Divergent Transcript	• CDKN2A-DT (CDKN2A Divergent Transcript) is an RNA Gene, and is affiliated with the lncRNA class. Diseases associated with CDKN2A-DT include Lung Squamous Cell Carcinoma.
CLASRP	CLK4 Associating Serine/Arginine Rich Protein	• Diseases associated with CLASRP include Paralytic Lagophthalmos and Paranasal Sinus Sarcoma. Among its related pathways are mRNA Splicing-Major Pathway.
FADS2	Fatty Acid Desaturase 2	• Diseases associated with FADS2 include Fanconi Anemia, Complementation Group D2 and Best Vitelliform Macular Dystrophy. Among its related pathways are alpha-linolenic acid (ALA) metabolism and fatty acid beta-oxidation (peroxisome) [2, 3, 4, 5].
FBXO31	F-Box Protein 31	• Diseases associated with FBXO31 include Mental Retardation, Autosomal Recessive 45 and Autosomal Recessive Non-Syndromic Intellectual Disability. Among its related pathways are Class I MHC mediated antigen processing and presentation and Innate Immune System [6].
GLYR1	Glyoxylate Reductase 1 Homolog	• Diseases associated with GLYR1 include Retinitis Pigmentosa 20. Gene Ontology (GO) annotations related to this gene include methylated histone binding and phosphogluconate dehydrogenase (decarboxylating) activity.
GOLGA7	Golgin A7	• GOLGA7 (Golgin A7) is a Protein Coding gene. Among its related pathways are Innate Immune System [7].
MCM2	Minichromosome Maintenance Complex Component 2	• Diseases associated with MCM2 include Deafness, Autosomal Dominant 70 and Autosomal Dominant Non-Syndromic Sensorineural Deafness Type Dfna. Among its related pathways are E2F mediated regulation of DNA replication and Mitotic G1-G1/S phases [8, 9, 10, 11].
MFSD4A	Major Facilitator Superfamily Domain Containing 4A	• Diseases associated with MFSD4A include Spherocytosis, Type 5. An important paralog of this gene is MFSD4B.
MIR3117	MicroRNA 3117	• microRNAs (miRNAs) are short (20-24 nt) non-coding RNAs that are involved in post-transcriptional regulation of gene expression in multicellular organisms by affecting both the stability and translation of mRNAs.
PAICS	Phosphoribosylaminoimidazole Carboxylase And Phosphoribosylaminoimidazolesuccinocarboxamide Synthase	• Diseases associated with PAICS include Hyperinsulinemic Hypoglycemia, Familial, 2 and Amyotrophic Lateral Sclerosis 1. Among its related pathways are purine nucleotides de novo biosynthesis and Metabolism of nucleotides.
PCDHGB5	Protocadherin Gamma Subfamily B, 5	• Gene Ontology (GO) annotations related to this gene include calcium ion binding. An important paralog of this gene is PCDHGB4.
PLEC	Plectin	• Diseases associated with PLEC include Epidermolysis Bullosa Simplex, Ogna Type and Muscular Dystrophy, Limb-Girdle, Autosomal Recessive 17. Among its related pathways are Cell junction organization and Apoptotic cleavage of cellular proteins [12, 13, 14, 15].
PRKAG1	Protein Kinase AMP-Activated Non-Catalytic Subunit Gamma 1	• Diseases associated with PRKAG1 include Trichuriasis and Wolff-Parkinson-White Syndrome. Among its related pathways are mTOR signalling and Oxytocin signaling pathway.
SPRTN	SprT-Like N-Terminal Domain	• Diseases associated with SPRTN include Ruijs-Aalfs Syndrome and Dental Pulp Necrosis. Among its related pathways are Translesion synthesis by Y family DNA polymerases bypasses lesions on DNA template and DNA Double-Strand Break Repair.
TARS	Threonyl-TRNA Synthetase 1	• Diseases associated with TARS1 include Trichothiodystrophy 7, Nonphotosensitive and Kidney Lipoma. Among its related pathways are Gene Expression and tRNA Aminoacylation.
TRAV4	T Cell Receptor Alpha Variable	• Protein Coding gene, an important paralog of this gene is TRAV26-1.
VAMP2	Vesicle Associated Membrane Protein 2	• Diseases associated with VAMP2 include Tetanus and Infant Botulism. Among its related pathways are Vesicle-mediated transport and Neurotransmitter Release Cycle [16, 17, 18].
ZNF284	Threonyl-TRNA Synthetase 1	• Diseases associated with TARS1 include Trichothiodystrophy 7, Nonphotosensitive and Kidney Lipoma. Among its related pathways are Gene Expression and tRNA Aminoacylation.
ZNF649-AS1	Zinc Finger Protein 284	• Among its related pathways are Herpes simplex virus 1 infection. Gene Ontology (GO) annotations related to this gene include nucleic acid binding. An important paralog of this gene is ZNF225.

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