Table S11 - IPA biological functions unique to EGA1 super-group

Categories	Functions Annotation	p-value[a]	Z-score[b]	Activation State	Total DEGs	Sub-Group
Cellular Development	Maturation of lymphatic system cells	7.68E-03	1.4		5	EGA1-1
Cellular Development, Hematological System Development and Function, Lymphoid Tissue Structure and Development	Maturation of lymphocytes	2.07E-02	1.091		4	EGA1-1
Cellular Movement	Invasion of lung cancer cell lines	1.45E-02	1.067		4	EGA1-1
Cell Cycle, Connective Tissue Development and Function	G1 phase of fibroblast cell lines	2.76E-03	1		4	EGA1-1
Nervous System Development and Function	Myelination of central nervous system	1.48E-04	0.278		4	EGA1-1
Cell Death and Survival, Cellular Function and Maintenance	Self-renewal of cells	2.31E-02	-0.254		4	EGA1-1
Cell Death and Survival	Apoptosis of squamous cell carcinoma cell lines	2.88E-03	-0.655		4	EGA1-1
Cell Death and Survival, Embryonic Development	Apoptosis of embryonic cells	6.88E-03	-1.953		4	EGA1-1
Cell Death and Survival	Cell survival of tumor cell lines	6.88E-03			4	EGA1-1
Cell Cycle	Mitosis of cervical cancer cell lines	9.12E-03			4	EGA1-1
Connective Tissue Development and Function, Skeletal and Muscular System Development and Function	Resorption of bone	1.98E-02			4	EGA1-1
Cell Cycle	Aneuploidy of embryonic cell lines	1.90E-05			3	EGA1-1
Cell Cycle, Respiratory System Development and Function	G1 phase of lung cell lines	1.49E-04			3	EGA1-1
Cell Cycle	Delay in cell cycle progression	2.64E-03			3	EGA1-1
Cell Death and Survival, Cellular Function and Maintenance	Colony survival of tumor cell lines	3.73E-03			3	EGA1-1
Gene Expression	Transcription of mRNA	4.50E-03			3	EGA1-1
Cellular Development, Cellular Growth and Proliferation, Embryonic Development, Hematological System Development and Function, Hematopoiesis, Humoral Immune Response, Lymphoid Tissue Structure and Development, Organ Development, Organismal Development, Tissue Development	Differentiation of plasma cells	4.77E-03			3	EGA1-1
Cell Morphology	Size of tumor cell lines	5.66E-03			3	EGA1-1
Cellular Growth and Proliferation	Accumulation of tumor cell lines	5.98E-03			3	EGA1-1
Cell Cycle	Arrest in G2/M phase transition	8.48E-03			3	EGA1-1
Cell Cycle, Cell Morphology	Formation of spindle apparatus	1.40E-02			3	EGA1-1
Cell Signaling, Nucleic Acid Metabolism, Small Molecule Biochemistry	Binding of guanosine 5'-O-(3-thiotriphosphate)	1.46E-02			3	EGA1-1
Cellular Development, Cellular Growth and Proliferation, Respiratory System Development and Function	Proliferation of lung cell lines	1.68E-02			3	EGA1-1
Cellular Development, Cellular Growth and Proliferation, Hematological System Development and Function, Hematopoiesis	Expansion of hematopoietic progenitor cells	2.26E-02			3	EGA1-1
DNA Replication, Recombination, and Repair	Meiotic nondisjunction	2.26E-02			3	EGA1-1
Carbohydrate Metabolism, Small Molecule Biochemistry	Catabolism of D-glucose	4.99E-05			2	EGA1-1
Tissue Development	Regeneration of muscle	1.21E-04			2	EGA1-3
Cell Cycle, Humoral Immune Response	Arrest in cell cycle progression of B lymphocytes	2.96E-04			2	EGA1-1
Cell Morphology, Cellular Compromise	Deformation of nucleus	2.96E-04			2	EGA1-1
Embryonic Development, Tissue Development	Accumulation of embryonic cells	4.92E-04			2	EGA1-1
Energy Production	Consumption of oxygen	5.25E-04			2	EGA1-3
Cell Cycle, Connective Tissue Development and Function	Delay in cell cycle progression of fibroblast cell lines	7.34E-04			2	EGA1-1
Cell Cycle, Connective Tissue Development and Function	Entry into mitosis of fibroblast cell lines	7.34E-04			2	EGA1-1
Cell Cycle, Connective Tissue Development and Function	Entry into cell cycle progression of fibroblast cell lines	7.34E-04			2	EGA1-1
Cell Cycle, Hair and Skin Development and Function	Entry into S phase of epithelial cell lines	1.02E-03			2	EGA1-1
Cell Cycle, Respiratory System Development and Function	G1/S phase transition of lung cell lines	1.02E-03			2	EGA1-1
Cell Morphology, Cellular Function and Maintenance	Autophagy of tumor cell lines	1.18E-03			2	EGA1-3
Embryonic Development, Nervous System Development and Function, Organ Development, Organismal Development, Tissue Development	Myelination of corpus callosum	1.36E-03			2	EGA1-1
Cell Cycle, Embryonic Development	Cell cycle progression of embryonic cells	1.36E-03			2	EGA1-1
Cell Morphology, Digestive System Development and Function, Hepatic System Development and Function, Organ Morphology, Organismal Development, Tissue Morphology	Size of hepatocytes	1.36E-03			2	EGA1-1
Cellular Assembly and Organization, DNA Replication, Recombination, and Repair	Rearrangement of chromosomes	1.74E-03			2	EGA1-1
Cellular Growth and Proliferation	Cloning of cells	1.74E-03			2	EGA1-1
Cell Cycle, Connective Tissue Development and Function	Aneuploidy of fibroblast cell lines	1.74E-03			2	EGA1-1
Embryonic Development, Organismal Development	Duplication of body axis	2.63E-03			2	EGA1-1

Cellular Development, Skeletal and Muscular System Development and Function	Differentiation of muscle cell lines	2.76E-03	2	EGA1-2
Cell-To-Cell Signaling and Interaction, Cellular Growth and Proliferation, Connective Tissue Development and Function	Stimulation of fibroblast cell lines	3.14E-03	2	EGA1-1
Cell Morphology, Hair and Skin Development and Function	Size of epithelial cell lines	3.69E-03	2	EGA1-1
Cellular Development, Cellular Growth and Proliferation, Respiratory System Development and Function	Arrest in proliferation of lung cell lines	4.29E-03	2	EGA1-1
Cell Morphology, Cellular Function and Maintenance	Repair of cervical cancer cell lines	4.29E-03	2	EGA1-1
Cell Morphology, Renal and Urological System Development and Function	Size of kidney cell lines	4.93E-03	2	EGA1-1
Cell Morphology, Embryonic Development	Size of embryonic cell lines	5.60E-03	2	EGA1-1
Cell Cycle, Renal and Urological System Development and Function	G1 phase of kidney cell lines	5.60E-03	2	EGA1-1
Cell Death and Survival, Cellular Function and Maintenance	Self-renewal of lymphatic system cells	6.32E-03	2	EGA1-1
Gene Expression	Synthesis of rRNA	6.32E-03	2	EGA1-1
Cellular Movement, Hematological System Development and Function, Immune Cell Trafficking	Mobilization of mononuclear leukocytes	6.32E-03	2	EGA1-1
DNA Replication, Recombination, and Repair, Energy Production, Molecular Transport, Nucleic Acid Metabolism, Small Molecule Biochemistry	Depletion of ATP	7.08E-03	2	EGA1-1
Cellular Development, Cellular Growth and Proliferation, Connective Tissue Development and Function, Tissue Development	Proliferation of synovial fibroblasts	7.08E-03	2	EGA1-1
Cellular Assembly and Organization	Activation of mitochondria	7.88E-03	2	EGA1-1
Cell Morphology, Cellular Assembly and Organization	Size of nucleus	8.71E-03	2	EGA1-1
Carbohydrate Metabolism	Localization of carbohydrate	9.58E-03	2	EGA1-1
Cell Cycle, Connective Tissue Development and Function	Entry into S phase of fibroblasts	9.58E-03	2	EGA1-1
Cell Cycle	Interphase of melanoma cell lines	1.14E-02	2	EGA1-1
Cell Morphology, Cellular Assembly and Organization, DNA Replication, Recombination, and Repair	Morphology of mitotic spindle	1.14E-02	2	EGA1-1
Embryonic Development, Organismal Development	Gastrulation	1.14E-02	2	EGA1-1
Cell Morphology, Connective Tissue Development and Function, Skeletal and Muscular System Development and Function, Tissue Development, Tissue Morphology	Morphology of osteoclasts	1.24E-02	2	EGA1-1
Cell Death and Survival, Embryonic Development	Apoptosis of mesenchymal cells	1.24E-02	2	EGA1-1
Cell Cycle, Connective Tissue Development and Function	Entry into S phase of fibroblast cell lines	1.34E-02	2	EGA1-1
Cellular Movement, Embryonic Development	Migration of mesenchymal stem cells	1.45E-02	2	EGA1-1
Cell Cycle, Embryonic Development	Arrest in G1 phase of embryonic cell lines	1.56E-02	2	EGA1-1
Cell Cycle	Arrest in interphase of kidney cell lines	1.67E-02	2	EGA1-1
Cell Morphology, Cellular Assembly and Organization	Mass of mitochondria	1.67E-02	2	EGA1-1
Cell Cycle, Connective Tissue Development and Function	G1 phase of fibroblasts	1.79E-02	2	EGA1-1
Cell Morphology, Lymphoid Tissue Structure and Development	Size of lymphatic system cells	1.90E-02	2	EGA1-1
Cellular Movement	Invasion of cervical cancer cell lines	1.90E-02	2	EGA1-1
Nervous System Development and Function, Tissue Morphology	Quantity of oligodendrocytes	1.90E-02	2	EGA1-1
Cell Cycle	Initiation of S phase	2.15E-02	2	EGA1-1

a) The p-value: statistical overlap of differentially expressed gene list and gene set

b) Z-score: $z>1.96$ to be significantly activated or increased, and those with $z< -1.96$ to be significantly inhibited