



Introduction

Description

Signal transducer and activator of transcription 5A, acts in JAK-STAT cascade, mammary gland development, erythrocyte differentiation, immune response, and apoptosis, downregulated in HIV infection, acute myeloid leukemia, and breast neoplasms

Gene symbol

STAT5A

Synonyms

(MGF); (STAT5); STAT5A; STAT_5_A; Signal Transducer and Activator of Transcription 1; signal transducer and activator of transcription 5a

Gene Ontology [what is this?](#)

Molecular function

DNA binding [E], transcription factor activity, ligand-activated RNA polymerase II transcription factor binding [E]... [details](#)

Biological process

apoptotic DNA fragmentation [E], epithelial to mesenchymal transition [E], immune response, JAK-STAT cascade [S, E], regulation of cell death [E]... [details](#)

Cellular component

cytoplasm, cytosol [Z], nucleoplasm [Z], nucleus [E] [details](#)

Orthologs & Molecular Hierarchy [what is this?](#)



Biomarker Associations [what is this?](#)

Diseases associated with STAT5A (24 entries)

Show 5 entries						Search:		
Disease details-all	Significance	Type of Association				Indication		
		Causal 27 associations	Correlative 41 associations	Preventative 3 associations	Negative	Disease Mechanism 30 associations	Prognosis 11 associations	Therapeutic Target 7 associations
Breast Neoplasms	16 associations	5 associations	11 associations			5 associations	3 associations	
Prostatic Neoplasms	11 associations	7 associations	3 associations	1 associations		8 associations	2 associations	2 associations
Leukemia, Myeloid, Acute	5 associations	4 associations	1 associations			4 associations		2 associations
Leukemia, Myelogenous, Chronic, BCR-ABL Positive	4 associations	2 associations	1 associations	1 associations		3 associations		1 associations
Colonic Neoplasms	4 associations		4 associations				1 associations	
Showing 1 to 5 of 24 entries								
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Inherited STAT5A mutations

The [Human Gene Mutation Database \(HGMD®\) report](#) provides information on the following inherited STAT5A mutations (subscription required):

Mutation Type	Count	Mutation Type	Count
Missense/nonsense	2	Small indels	0
Splicing	0	Gross deletions	0
Regulatory	0	Gross insertions	0
Small deletions	0	Complex rearrangements	0
Small insertions	0	Repeat variations	0

Mutant Phenotype [what is this?](#)

Mutant phenotype of closely related homolog(s)

Mouse **Stat5a** (91.8% identity to Human STAT5A [0.0])

Anatomical effects : bone marrow; eosinophils; epithelium/epithelial cells; lung; macrophages; mammary gland/breast; milk; NK cells; prostate; serum; spleen ... [details](#)

Physiological effects : cell death/apoptosis; cell migration; control of body size; fertile; immunity and inflammation; regulated expression [details](#)

Expression [what is this?](#)

Tissue expression

Consensus normalized transcript expression levels provided by Human Protein Atlas (v20)

**Proteins, complexes, or pathways that influence STAT5A expression (1 entry)**

Show 5 ▼ entries	Search:
Regulator details	Effect
PR	Upregulated by
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Transcriptional Regulation [what is this?](#)**Regulation of STAT5A gene expression**[Analyze STAT5A with MATCH Suite](#) →**Predicted promoter sequences :** Match →Best supported : [PM001005234](#)All promoters for the gene : [PM001005234](#), [PM000591896](#)

* Note: Only binding sites whose location is relative to the TSS are graphically displayed. Binding sites with an asterisk (*) are not included in the graphical display.

Transcription factor binding sites within the STAT5A gene (5 entries)

Show 5 ▼ entries	Search:				
Identifier	Relative Location	Genomic Location	Binding Factor(s)	DNA Binding Reaction	Effect
HS\$STAT5A_04	around -3053		CREB(h)	CREB(h) --> STAT5A(h)	DNA binding
HS\$STAT5A_02		Chr17 42282881 42282920 +	PPARgamma(h)	PPARgamma(h) --> STAT5A(h)	DNA binding
HS\$STAT5A_05		Chr17 42287436 42287457 +	ELF-5(h)	ELF-5(h) --> STAT5A(h)	DNA binding
HS\$STAT5A_06		Chr17 42287437 42287457 +	ELF-5(h)		

**Table of Contents** ↓**In vivo fragments within the promoter(s) of the STAT5A gene that are bound by transcription factors (1007 entries)**Show **5** ▾ entriesSearch:

Promoter	Transcription Factor	Genomic Location	Cell Source	Matrix	Relative Location	CSS	MSS	Sequence	Reference
PM001005234	BCL-6(h)	17:42278348..42278518	OCI-Ly1	V\$BCL6_Q6	-10090	0.980	0.836	TTTTTGAAC	GEO Data 29126285 23911289 23193258
PM000591896	FOXA1(h)	17:42296107..42296265	LNCaP + DMSO	V\$HNF3A_Q6	-9939	0.968	0.961	ACAAATAG	GEO Data 27672034 29126285 23193258
PM000591896	FOXA1(h)	17:42296140..42296255	MCF-7 + SIGATA	V\$HNF3A_Q6	-9939	0.968	0.961	ACAAATAG	GEO Data 29126285 23172872 23193258
PM000591896	ZNF263(h)	17:42296041..42296389	HEK293Trex	V\$FPM315_01	-9900	1.000	0.942	GAGGGAGGACTT	ENCODE Data 22955616
PM000591896	ZNF263(h)	17:42296176..42296308	HepG2	V\$FPM315_01	-9900	1.000	0.942	GAGGGAGGACTT	ENCODE Data 22955616

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Predicted enhancers / silencers for STAT5A regulation (8 entries)Show **5** ▾ entriesSearch:



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					RefSeq promoter		
EN000024050	activation	chr17:42063680..42064028	349	pair-wise expression correlation with robust FANTOM5 promoter	blood (monocytes), macrophages (macrophages)	FANTOM5	
EN000024053	activation	chr17:42248499..42248985	487	pair-wise expression correlation with RefSeq promoter, pair-wise expression correlation with robust FANTOM5 promoter	blood (B lymphocytes), blood (neutrophils), blood (natural killer cells), blood (monocytes), blood (reticulocyte), blood (dendritic cells), blood (mast cells), blood (T cells), blood, bone marrow (mesenchymal cell), brain (fibroblast of choroid plexus), brain, cartilage (chondrocytes), colon/large intestine (large intestine), esophagus, eye, fat (preadipocyte), fat (fat tissue), gingiva (gingival epithelial cell), heart, internal male genitalia, kidney, lung, lymph node, macrophages (macrophages), meninx, muscle (vascular associated smooth muscle cell), muscle (skeletal muscle cells), muscle (myoblast), muscle (smooth muscle), muscle (skeletal muscle), neurons (neuronal stem cell), placenta (placental epithelial cell), placenta, prostate, salivary gland, spinal cord, spleen, stomach, thyroid (thyroid gland), umbilical cord, uterus	FANTOM5	


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				RefSeq promoter, pair-wise expression correlation with robust FANTOM5 promoter	cells), blood (T cells), blood, cartilage (chondrocytes), gingiva (gingival epithelial cell), neurons (neuronal stem cell), placenta (placental epithelial cell)	
EN000024058	activation	chr17:42312448..42312867	420	pair-wise expression correlation with RefSeq promoter, pair-wise expression correlation with robust FANTOM5 promoter	thyroid (thyroid gland)	FANTOM5

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Translational Regulation [what is this?](#)

Regulation of STAT5A mRNA expression

miRNA binding sites within STAT5A mRNA (3 entries)

Show **5** ▼ entriesSearch:

Identifier	Region	Location	Location Reference Point	Binding Factor(s)
HS\$STAT5A_01	3' UTR	163 to 183	stop codon (end of coding sequence (CDS))	hsa-miR-222-3p(h)
HS\$STAT5A_07				hsa-miR-223-3p(h)
HS\$STAT5A_08				hsa-miR-296-3p(h)

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Nucleotide Sequence : AGACAGG...AAAAAAA (1..4314; 4314 nt) [details](#)

Sequence source : REFSEQ#NM_003152

FASTA

PROTEIN

Drug Interactions [what is this?](#)

Drug(s) targeting STAT5A (12 entries)

Show

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 entries

Search:

Drug(s)	Status	Interaction Data Source	Reference(s)
4,4'-PROPANE-2,2-DIYLDIPHENOL	small molecule,experimental	DrugBank	30065191
azd-1480	small molecule, investigational	DrugBank	25810010
biib021	small molecule, investigational	DrugBank	25914683 26892093
bms-214662	small molecule, investigational	DrugBank	21483442
capmatinib	Small molecule, approved	DrugBank	21918175

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Pathways & Interactions [what is this?](#)

Pathways



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Name	Reactions	Representation	Load in PathFinder
Epo pathway	View Supporting Reactions	View Graphic Representation	 Load in PathFinder →
ErbB4 mediated signaling	View Supporting Reactions		 Load in PathFinder →
IL-3 signaling	View Supporting Reactions	View Graphic Representation	 Load in PathFinder →
IL-5 pathway	View Supporting Reactions	View Graphic Representation	 Load in PathFinder →
PRL pathway	View Supporting Reactions	View Graphic Representation	 Load in PathFinder →

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Subcomponents assembled from experiments involving orthologous proteins (11 entries)

Show entries

Search:

Name	View Supporting Reactions	View Graphic Representation	Load in PathFinder
Epo ---Lyn---> STAT5A	View Supporting Reactions		 Load in PathFinder →
ErbB4, ligand-dependending processing	View Supporting Reactions		 Load in PathFinder →
IL-3 ---> STAT5	View Supporting Reactions		 Load in PathFinder →
IL-5 ---> STAT5	View Supporting Reactions		 Load in PathFinder →
PAK1 ---> STAT5A	View Supporting Reactions		 Load in PathFinder →

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Name	Reactions	Representation	Load in PathFinder
c-Kit ---> STAT5A:STAT5B	View Supporting Reactions		 Load in PathFinder →
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Pathways from Reactome (42 entries)

Provided by the [Reactome](#) database, release 78 ([ReactomePathways.gmt](#)).

Show

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 entries

Search:

Name	Reactome pathway report link	Reactome pathway browser link
Cytokine Signaling in Immune system	R-HSA-1280215	Open in Reactome Browser
Disease	R-HSA-1643685	Open in Reactome Browser
Diseases of signal transduction by growth factor receptors and second messengers	R-HSA-5663202	Open in Reactome Browser
Downstream signal transduction	R-HSA-186763	Open in Reactome Browser
Erythropoietin activates STAT5	R-HSA-9027283	Open in Reactome Browser
Showing 1 to 5 of 42 entries		
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Pathways from WikiPathways (28 entries)

Provided by the [WikiPathways](#) database.

Show

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 entries

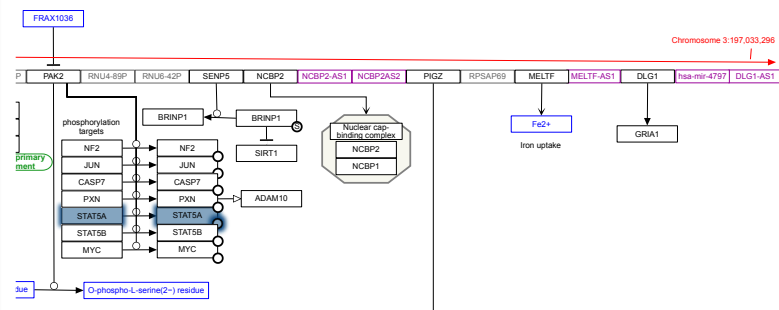
Search:

Name	Display below	WikiPathways external link
3q29 copy number variation syndrome	View	WikiPathways
Adipogenesis	View	WikiPathways
AGE/RAGE pathway	View	WikiPathways
Brain-derived neurotrophic factor (BDNF) signaling pathway	View	WikiPathways



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Protein-protein interactions

[+](#) Proteins bound by STAT5A (80 partners)



- + Proteins or complexes that activate STAT5A (8 partners)
- + Proteins or complexes that inhibit STAT5A (1 partner)
- + Proteins or complexes that phosphorylate STAT5A (43 partners)
- + Proteins or complexes that affect STAT5A in other ways (22 partners)

Events triggered by STAT5A

- + Proteins or complexes activated by STAT5A (1 partner)
- + Proteins or complexes affected by STAT5A in other ways (78 partners)

Genes regulated (directly or indirectly) by STAT5A

Show 5 entries	Search:
Gene details	Effect
BCL6	Upregulated by
CCND1	Upregulated by
CISH	Upregulated by
CITED2	Upregulated by
CSN2	Upregulated by
Showing 1 to 5 of 13 entries	
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Transcription Factor Activity [what is this?](#)

Regulation of gene expression by STAT5A

Transcription factor classification :

STAT5A; [6.2.1.0.5](#)



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Genes bound by STAT5A (32 entries)

Show entries Search:

Gene	Location within Gene	Binding Site Identifier	DNA Binding Reaction	Effect	Quality Score
		AS\$STAT5A_113			5
CCND1(h)	-457 to -435	HS\$CCND1_17	STAT5A(h) --> CCND1(h)	transactivation	3
CCND1(h)	-251 to -225	HS\$CCND1_19	STAT5A(h) --> CCND1(h)	transactivation	3
CCND1(h)	-457 to -435	HS\$CCND1_17	STAT5A(h) --> CCND1(h)	transactivation	3
CCND1(h)	-251 to -225	HS\$CCND1_19	STAT5A(h) --> CCND1(h)	transactivation	3

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ChIP-seq or similar experiments for STAT5A(3 entries)

Show entries Search:

ChIP Experiment Report	Chromosome	Binding Fragments	Cell	Reference
View Report	Human Genome	7375	GM12878	ENCODE Data 22955616
View Report	Human Genome	9806	K562	ENCODE Data 22955616
View Report	Human Genome	20808	MV4-11	GEO Data 29126285 26212328 23193258

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Positional weight matrices for STAT5A (10 entries)

Show entries Search:

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	V\$STAT5A_02	factor-specific	SELEX (CASTing, SAAB, TDA, Target detection assay)
	V\$STAT5A_03	factor-specific	SELEX (CASTing, SAAB, TDA, Target detection assay)
	V\$STAT5A_04	factor-specific	compiled matrix imported from literature reference

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Transcription factors which interact with STAT5A

Show ▼ entries

Search:

Species	Factor
Human	BRCA1 , BRCA2 , DDX20 , EGFR , EPAS-1 , HTF-4 , OLIGO1{pY} , POU2F1-isoform1 , PPARgamma , STAT5A , STAT5A{pY} , STAT5B , STAT5B{pY}

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Protein Features [what is this?](#)

Overview of protein sequence and structure

- Chromosome : 17q11.2
- Isoforms : [STAT5A-isoform1](#) , [STAT5A-isoform2](#)
- +

 View associated sequences and their domains
- +

 View related proteins

Post-translational modifications of STAT5A protein

0794

Acetylated {ace}	Phosphorylated {p}	Other
Sumoylated {sumo}	Ubiquitinated {ub}	Abbreviations key



View complexes containing STAT5A protein

+ View complexes (81 entry)

Annotations [what is this?](#)

Display all annotations

Description

- Signal transducer and activator of transcription 5A, acts in JAK-STAT cascade, mammary gland development, erythrocyte differentiation, immune response, and apoptosis, downregulated in HIV infection, acute myeloid leukemia, and breast neoplasms [18552213](#) [18316550](#) [20388848](#)
[16303247](#) [17617599](#) [7719937](#) [10926930](#)

Function

- Activator
- Cooperates and forms a unique DNA-binding complex with [Oct-1](#) [14645506](#)
- Mediates induction of the cyclin D1 gene by [thrombopoietin \(TPO\)](#) [14645506](#)
- Phosphorylated in response to cytokine induction

Domains

- Binds as homodimer and homotetramer to consensus [GAS](#) (interferon gamma-activated sequences) motifs TTC(T/C)N(G/A)[GAA](#) [10594041](#)
- [STAT](#)
- [STAT5A](#) binds to the [beta-casein](#) promoter as well as to the [CIS](#) promoter as a tetramer [9742102](#)
- [STAT5A](#) tetramers bind to two tandem repeated [GAS](#) sites with an optimal spacing of 6 bp [10594041](#)
- Transactivation domain is necessary for interactions with [Oct-1](#) [14645506](#)



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- Increased protein expression correlates with increased progression-free survival in follicular lymphoma [20300410](#)
- Serine phosphorylation correlates with acute myeloid leukemia [20508164](#)

Identifiers [what is this?](#)

Accessions mapped to this record

BIOBASE gene accession : GN000003122, G002606, MO000023032

BIOBASE protein accession : PR000006110, f00310, MO000013125, MO000023545, MO000043700, MO000151815, MO000317461, MO000317471, MO000317508, MO000480151, T04683, T16531, T16535

Gene

Affymetrix	11717178_a_at, 11745364_a_at, 16834273, 203010_at, 3721659, 3721660, 3721661, 3721662, 3721663, 3721664, 3721665, 3721667, 3721669, 3721670, 3721671, 3721672, 3721673, 3721674, 3721676, 3721678, 3721679, 3721680, 3721681, 3721683, 3721684, 3721685, 3721686, 3721687, 3721688, 3721689, 3721690, 3721691, 3757791, 3757799, 3757800, 3757801, 3757807, 40458_at, 506_s_at, 75183_at, 8007212, g4507256_3p_at, TC17000523.hg, U43185_s_at,
Agilent	A_14_P103776
Ensembl	ENSG00000126561 , ENST00000345506 , ENST00000468096 , ENST00000469124 , ENST00000479417 , ENST00000546010 , ENST00000587646 , ENST00000588868 , ENST00000590726 , ENST00000590949 , ENST00000591556 , ENST00000676585 , ENST00000676631 , ENST00000677301 , ENST00000677893 , ENST00000678903
EntrezGene	6776
Genbank	1151169 , 158256731 , 17975626 , 20072533 , 21618341 , 4507256 , 48144321 , 62087523 , 736682 , 94404552 , AB208972 , AJ412878 , AK291650 , BC027036 , CQ815789 , DQ471288 , L41142 , NM_003152 , U43185
HGMD	STAT5A
HumanProteinAtlas	ENSG00000126561
Illumina	0006130377, ILMN_1753547
OMIM	601511



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	WP3303	WP3680	WP3945	WP395	WP3972	WP4149	WP4255	WP437	WP4630	WP4666	WP49	
	WP4906	WP5063	WP581	WP585	WP673							

Protein

Genbank	1151170	158256732	17975627	20072534	21618342	4507257	48144322	62087524	736683	94404553
	AAA73962.1	AAB06589.1	AAH27036.1	ABF17939.1	BAD92209.1	BAF84339.1	CAD19637.1	CAG32953.1		
	NP_003143.1	NP_003143.2								
PFAM	PF00017	PF01017								
PROSITE	PS50001									
UniProt	P42229									

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