A Reference Guide for Jak/STAT Signaling

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Type I/II Interferons

Ligand	Receptor Complex	Activated Jak Family Member	Citation #	Activated STAT Family Member	Citation #
IFN-alpha	IFN-alpha/beta R1 + IFN-alpha/beta R2	Jak1	4	STAT1	13
		Jak2	5	STAT2	13
		Tyk2	6	STAT3	14
				STAT4	15
				STAT5	16
				STAT6	17
IFN-beta	IFN-alpha/beta R1 + IFN-alpha/beta R2	Jak1	7	STAT1	7
		Jak2	8	STAT2	7
		Tyk2	9	STAT3	18
				STAT4	19
				STAT5	20
				STAT6	21
IFN-gamma	IFN-gamma R1/CD119 + IFN-gamma R2	Jak1	10	STAT1	13
		Jak2	11	STAT2	22
		Tyk2	12	STAT3	14
				STAT5	12
				STAT6	23

Receptor Tyrosine Kinases

Ligand	Receptor Complex	Activated Jak Family Member	Citation #	Activated STAT Family Member	Citation #
PBEF/Vistafin	Insulin R/CD220	Jak2	24	STAT3	43
IGF-I	IGF-I R	Jak1	25	STAT3	44
		Jak2	25	STAT5	45
EGF	EGF R/ErbB1	Jak1	26	STAT1	46
		Jak2	27	STAT3	47
			12	STAT5	27
EGF	ErbB2/Her2	Jak2	28	STAT1	48
				STAT3	28
				STAT5	49
EGF	ErbB4/Her4	Jak2	29	STAT1	50
				STAT5	49
PDGF	PDGF R alpha + PDGF R beta	Jak1	30	STAT1	30
		Jak2	31	STAT3	31
		Tyk2	31	STAT5	51
				STAT6	51
SCF/c-kit Ligand	SCF R/c-kit	Jak2	32	STAT1	52
				STAT3	53
				STAT5	54
M-CSF	M-CSF R	Jak1	33	STAT1	33
		Tyk2	33	STAT3	33
				STAT5	55
FGF	FGF R1	Jak1	34	STAT1	56
	FGF R2	Jak2	35	STAT3	56

	FGF R3	Jak3	36	STAT5	57
	FGF R4	Tyk2	34		3
Ephrin-A	EphA4	Jak2	37	STAT1	37
				STAT3	37
BDNF	TrkB	Jak2	38	STAT1	38
				STAT3	38
Angiopoietin-2	Tie-2			STAT3	58
				STAT5	59
VEGF	VEGF R1/ Flt-1	Jak2	39	STAT1	60
	VEGF R2/KDR/Flk-1	Tyk2	40	STAT3	60
	VEGF R3/Flt-4			STAT5	39
				STAT6	40
Gas6	Mer			STAT3	61
				STAT5	62
				STAT6	63
HGF	HGF R/c-MET	Jak1	41	STAT1	64
		Jak2	42	STAT3	65
				STAT5	64

Homodimeric Hormone Receptors

Ligand	Receptor Complex	Activated Jak Family Member	Citation #	Activated STAT Family Member	Citation #
Growth Hormone	Growth Hormone R	Jak1	66	STAT1	75
		Jak2	67	STAT3	66
				STAT5	66

Thrombopoietin/ Tpo	Thrombopoietin R/ Tpo R	Jak2	68	STAT1	69
		Tyk2	69	STAT3	76
				STAT5	76
Erythropoietin	Erythropoietin R	Jak2	70	STAT1	77
		Jak3	71	STAT3	78
				STAT5	79
Prolactin	Prolactin R	Jak1	72	STAT1	80
		Jak2	73	STAT3	81
				STAT5	82

Common beta Chain Receptor Family

Ligand	Receptor Complex	Activated Jak Family Member	Citation #	Activated STAT Family Member	Citation #
IL-3	IL-3 R alpha/ CD123 +	Jak1	76	STAT1	87
	Common beta Chain	Jak2	86	STAT3	87
		Tyk2	87	STAT5	91
				STAT6	79
IL-5	IL-5 R alpha/ CD125 +	Jak1	88	STAT3	92
	Common beta Chain	Jak2	89	STAT5	88
GM-CSF	GM-CSF R alpha +	Jak1	88	STAT1	93
	Common beta Chain	Jak2	90	STAT3	93
				STAT5	91
				STAT6	94

Common gamma Chain Receptor Family

Ligand	Receptor Complex	Activated Jak Family Member	Citation #	Activated STAT Family Member	Citation #
IL-2	IL-2 R alpha + IL-2 R beta + Common gamma Chain/IL-2 R gamma	Jak1	95	STAT1	107
		Jak2	96	STAT3	108
		Jak3	97	STAT4	109
				STAT5	110
				STAT6	79
IL-4	IL-4 R alpha + Common gamma Chain/IL-2 R gamma	Jak1	95	STAT1	111
	IL-4 R alpha + IL-13 R alpha 1	Jak2	98	STAT3	112
		Jak3	99	STAT4	113
		Tyk2	98	STAT5	114
				STAT6	79
IL-7	IL-7 R alpha/CD127 + Common gamma Chain/IL-2 R gamma	Jak1	95	STAT1	100
		Jak3	100	STAT2	115
				STAT3	116
				STAT5	116
				STAT6	115
IL-9	IL-9 R + Common gamma Chain/IL-2 R gamma	Jak1	95	STAT1	101
		Jak3	95	STAT3	117
		Tyk2	101	STAT5	118

IL-13*	IL-13 R alpha 1 + IL-4 R alpha	Jak1	98	STAT1	119
		Jak2	98	STAT3	112
		Jak3	102	STAT5	112
		Tyk2	98	STAT6	98
IL-15	IL-15 R alpha + IL-2 R beta +	Jak1	103	STAT1	120
	Common gamma Chain/IL-2 R gamma	Jak2	104	STAT2	115
		Jak3	103	STAT3	103
		Tyk2	105	STAT4	120
				STAT5	103
				STAT6	115
IL-21	IL-21 R + Common gamma Chain/IL-2 R gamma	Jak1	106	STAT1	106
		Jak3	106	STAT3	106
				STAT4	120
				STAT5	121
TSLP**	IL-7 R alpha/CD127 + TSLP R	Jak1	74	STAT1	83
		Jak2	74	STAT3	84
				STAT5	85

*IL-13 is often associated with the Common gamma Chain receptor family because it binds to the same receptor complex and possesses similar biologic properties as IL-4.

**TSLP is considered to be a IL-7-related cytokine as it shares several functions and a receptor subunit with IL-7.

IL-6 Family

Ligand	Receptor Complex	Activated Jak Family Member	Citation #	Activated STAT Family Member	Citation #

IL-6	IL-6 R alpha + gp130	Jak1	10	STAT1	135
		Jak2	122	STAT3	136
		Tyk2	10		
IL-11	IL-11 R alpha + gp130	Jak1	10	STAT1	137
		Jak2	123	STAT3	138
		Tyk2	124		
CNTF	CNTF R alpha + LIF R alpha + gp130	Jak1	10	STAT1	139
		Jak2	125	STAT3	138
		Tyk2	124		
Cardiotrophin-1/ CT-1	CT-1 R alpha + LIF R alpha + gp130	Jak1	126	STAT1	140
		Jak2	126	STAT3	126
		Tyk2	126	STAT5	141
LIF	LIF R alpha + gp130	Jak1	10	STAT1	142
		Jak2	123	STAT3	136
		Tyk2	127	STAT5	143
Oncostatin M/ OSM	OSM R beta + gp130	Jak1	10	STAT1	144
	LIF R alpha + gp130	Jak2	123	STAT3	138
		Tyk2	124	STAT5	145
				STAT6	146
G-CSF***	G-CSF R/CD114	Jak1	128	STAT1	147
		Jak2	129	STAT3	147
		Tyk2	12	STAT5	12

Leptin/OB***	Leptin R	Jak1	130	STAT1	148
		Jak2	131	STAT3	131
				STAT5	149
				STAT6	149
IL-31	IL-31 RA + OSM R beta	Jak1	132	STAT1	132
		Jak2	133	STAT3	132
				STAT5	132
CLF/CLC	CNTF R alpha + LIF R alpha + gp130	Jak1	134	STAT1	150
		Jak2	134	STAT3	134
		Tyk2	134		

***G-CSF and Leptin/OB are often associated with the IL-6 family of cytokines because the G-CSF and Leptin receptors are structurally similar to gp130.

IL-10 Family

Ligand	Receptor Complex	Activated Jak Family Member	Citation #	Activated STAT Family Member	Citation #
IL-10	IL-10 R alpha + IL-10 R beta	Jak1	151	STAT1	91
		Jak2	152	STAT3	151
		Tyk2	151	STAT5	159
IL-19	IL-20 R alpha + IL-20 R beta	Jak1	153	STAT3	160
		Jak2	153		
IL-20	IL-20 R alpha + IL-20 R beta	Jak2	154	STAT3	160
	IL-22 R alpha 1 + IL-20 R beta			STAT5	154

IL-22	IL-22 R alpha 1 + IL-10 R beta	Jak1	155	STAT1	155
		Tyk2	155	STAT3	155
				STAT5	155
IL-24	IL-20 R alpha + IL-20 R beta	Jak1	156	STAT1	161
	IL-22 R alpha 1 + IL-20 R beta			STAT3	156
IL-26/AK155	IL-20 R alpha + IL-10 R beta			STAT1	162
				STAT3	162
IL-28A/IFN-lambda 2	IL-10 R beta + IL-28 R alpha/IFN-lambda R1	Jak2	157	STAT1	163
				STAT2	164
				STAT3	164
IL-28B/IFN-lambda 3	IL-10 R beta + IL-28 R alpha/IFN-lambda R1			STAT1	163
				STAT2	165
IL-29/IFN-lambda 1	IL-10 R beta + IL-28 R alpha/IFN-lambda R1	Jak1	158	STAT1	163
		Tyk2	158	STAT2	163
				STAT3	163
				STAT4	166
				STAT5	166

IL-12 Family

Ligand	Receptor Complex	Activated Jak Family Member	Citation #	Activated STAT Family Member	Citation #

IL-12	IL-12 R beta 1 + IL-12 R beta 2	Jak2	167	STAT1	171
		Tyk2	167	STAT3	172
				STAT4	172
				STAT5	173
				STAT6	174
IL-23	IL-12 R beta 1 + IL-23 R	Jak2	168	STAT1	168
		Tyk2	168	STAT3	168
				STAT4	168
				STAT5	168
IL-27	IL-27 R alpha/WSX-1/ TCCR + gp130	Jak1	169	STAT1	169
		Jak2	170	STAT2	170
		Tyk2	170	STAT3	170
				STAT4	175
				STAT5	170
				STAT6	176
IL-35	IL-12 R beta 2 + gp130			STAT1	177
				STAT4	177

G Protein-Coupled Receptors

Ligand	Receptor Complex	Activated Jak Family Member	Citation #	Activated STAT Family Member	Citation #
Angiotensin II	AGTR-1	Jak1	178	STAT1	179
		Jak2	179	STAT2	179
		Tyk2	179	STAT3	195
				STAT5	196

				STAT6	197
Serotonin (5-HT)	5-HT2A	Jak1	180	STAT1	180
		Jak2	181	STAT3	181
Coagulation Factor II/ Thrombin	PAR1	Jak1	182	STAT1	198
	PAR3	Jak2	183	STAT3	199
	PAR4	Tyk2	182	STAT5	200
Bradykinin	Bradykinin RB2/BDKRB2	Jak2	184	STAT3	185
		Tyk2	185		
Platelet-activating Factor (PAF)	PAFR	Jak2	186	STAT1	187
		Tyk2	187	STAT2	187
				STAT3	187
				STAT5	201
Catecholamines	alpha-1A Adrenergic R/ ADRA1A	Jak2	188	STAT1	188
	alpha-1B Adrenergic R/ ADRA1B	Tyk2	188	STAT3	202
	alpha-1D Adrenergic R/ ADRA1D				
CXCL12/SDF-1	CXCR4	Jak1	189	STAT1	190
		Jak2	190	STAT2	190
		Jak3	190	STAT3	190
		Tyk2	189	STAT4	189
				STAT5	190

CCL2/JE/MCP-1	CCR2	Jak2	191	STAT1	194
				STAT3	191
				STAT5	203
RANTES/CCL5	CCR5	Jak1	192	STAT1	204
		Jak2	193	STAT3	204
		Jak3	193	STAT5	192
CCL15/MIP-1 delta	CCR1	Jak1	194	STAT1	194
				STAT3	194

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