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## Data Sheet **JAK1 (Janus Kinase 1) Assay Kit** Catalog #79518

**DESCRIPTION:** Janus kinase (JAK) is a family of intracellular, nonreceptor tyrosine kinases that play an important role in cytokine-mediated signaling. This family includes four protein kinases; Jak1, Jak2, Jak3 and Tyk2. Various studies have suggested that regulation of Jak activity should be a promising approach to combat numerous diseases such as immune deficiencies and cancers. The *JAK1 (Janus Kinase 1) Assay Kit* is designed to measure JAK1 activity for screening and profiling applications using Kinase-Glo<sup>®</sup> MAX as a detection reagent. The *JAK1 (Janus Kinase 1) Assay Kit* comes in a convenient 96-well format, with enough purified recombinant JAK1 enzyme, JAK1 substrate peptide (IRS-1tide), ATP and kinase assay buffer for 100 enzyme reactions.

### COMPONENTS:

Catalog #	Reagent	Amount	Storage	
40449	JAK1	10 µg	-80°C	<b>Avoid multiple freeze/thaw cycles!</b>
79334	5x Kinase assay buffer 1	1.5 ml	-20°C	
79686	ATP (500 µM)	100 µl	-20°C	
79519	10x IRS1-tide	500 µl	-20°C	
79696	96-well plate, white	1	Room Temp.	

### MATERIALS OR INSTRUMENTS REQUIRED BUT NOT SUPPLIED:

Kinase-Glo MAX (Promega #V6071)  
Dithiothreitol (DTT, 1 M)  
Microplate reader capable of reading luminescence  
Adjustable micropipettor and sterile tips  
30°C incubator

**APPLICATIONS:** Useful for studying enzyme kinetics and screening small molecular inhibitors for drug discovery and HTS applications.

**STABILITY:** Up to 6 months when stored as recommended.

### REFERENCE:

Alicea, N.L. *et al.*, *Current Drug Targets* **12(4)**:546-555 (2011)

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## ASSAY PROTOCOL:

**All samples and controls should be tested in duplicate.**

- 1) Thaw 5x Kinase assay buffer, ATP and 10X IRS1-tide.  
 (Please add DTT to 5x Kinase assay 1 buffer to make a 10 mM concentration; e.g. add 10  $\mu$ l of 1 M DTT to 1 ml 5x Kinase assay buffer 1. Prepare only enough 5x Kinase assay buffer with DTT as required for the assay, as any excess 5x kinase buffer/DTT cannot be stored and should be discarded)
- 2) Prepare the master mixture (25  $\mu$ l per well): N wells x (6  $\mu$ l 5x Kinase assay buffer 1 + 1  $\mu$ l ATP (500  $\mu$ M) + 5  $\mu$ l 10X IRS1-tide + 13  $\mu$ l distilled water). Add 25  $\mu$ l to every well.

	Positive Control	Test Inhibitor	Blank
5x Kinase assay buffer 1	6 $\mu$ l	6 $\mu$ l	6 $\mu$ l
ATP (500 $\mu$ M)	1 $\mu$ l	1 $\mu$ l	1 $\mu$ l
10X IRS1-tide	5 $\mu$ l	5 $\mu$ l	5 $\mu$ l
Water	13 $\mu$ l	13 $\mu$ l	13 $\mu$ l
Test Inhibitor	–	5 $\mu$ l	–
Inhibitor Buffer (no inhibitor)	5 $\mu$ l	–	5 $\mu$ l
1x Kinase buffer 1	–	–	20 $\mu$ l
JAK1 (5 ng/ $\mu$ l)	20 $\mu$ l	20 $\mu$ l	–
<b>Total</b>	<b>50 <math>\mu</math>l</b>	<b>50 <math>\mu</math>l</b>	<b>50 <math>\mu</math>l</b>

- 3) Add 5  $\mu$ l of Inhibitor solution of each well labeled as "Test Inhibitor". For the "Positive Control" and "Blank", add 5  $\mu$ l of the same solution without inhibitor (Inhibitor buffer).
- 4) Prepare 3 ml of 1x Kinase assay buffer 1 by mixing 600  $\mu$ l of 5x Kinase assay buffer 1 with 2400  $\mu$ l water. 3 ml of 1x Kinase assay buffer 1 is sufficient for 100 reactions.
- 5) To the wells designated as "Blank", add 20  $\mu$ l of 1x Kinase assay buffer.
- 6) Thaw JAK1 enzyme on ice. Upon first thaw, briefly spin tube containing enzyme to recover full content of the tube. Calculate the amount of JAK1 required for the assay and dilute enzyme to ~5 ng/ $\mu$ l with 1x Kinase assay buffer. Store remaining undiluted enzyme in aliquots at -80°C. *Note: JAK1 enzyme is sensitive to freeze/thaw cycles. Avoid multiple freeze/thaw cycles. Do not re-use thawed aliquots or diluted enzyme.*
- 7) Initiate reaction by adding 20  $\mu$ l of diluted JAK1 enzyme to the wells designated "Positive Control" and "Test Inhibitor". Incubate at 30°C for 45 minutes.
- 8) Thaw Kinase-Glo Max reagent.

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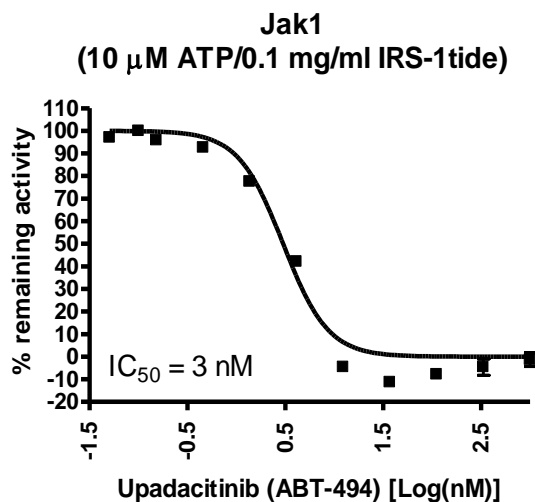
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- 9) After the 45 minute reaction, add 50  $\mu$ l of Kinase-Glo Max reagent to each well. Cover plate with aluminum foil and incubate the plate at room temperature for 15 minutes.
- 10) Measure luminescence using the microplate reader.

#### Example of Assay Results:



Inhibition of JAK1 enzyme by Upadacitinib, measured using the JAK1 (Janus Kinase 1) assay kit (Cat. #79518). *Data shown is lot-specific. For lot-specific information, please contact BPS Bioscience, Inc. at info@bpsbioscience.com*

#### RELATED PRODUCTS:

<u>Product Name</u>	<u>Catalog #</u>	<u>Size</u>
Jak1, GST-tag	40449	10 $\mu$ g
Jak2 (JH1 domain), His-tag	40450	10 $\mu$ g
Jak2 (JH1, JH2 domain), His-GST-tags	40451	10 $\mu$ g
JAK2-His-Avi-Tag, Biotin-Labeled	79074	10 $\mu$ g
Jak2 (V617F), GST/Avi-Tag, Biotin-Labeled	79115	10 $\mu$ g
Jak3, His-tag	40452	10 $\mu$ g
Tyk2, His-tag	40285	10 $\mu$ g
ISRE Reporter Kit (JAK/STAT Pathway)	60613	500 rxns.
ISRE Reporter – HEK293 Cell Line	60510	2 vials
Transfection Collection™ : ISRE Transient		
Pack JAK/STAT Signaling Pathway	79264	500 rxns.
JAK2 (Janus Kinase 2) Assay Kit	79520	96 rxns.
JAK3 (Janus Kinase 3) Assay Kit	79521	96 rxns.
TYK2 (Tyrosine Kinase 2) Assay Kit	79522	96 rxns.

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