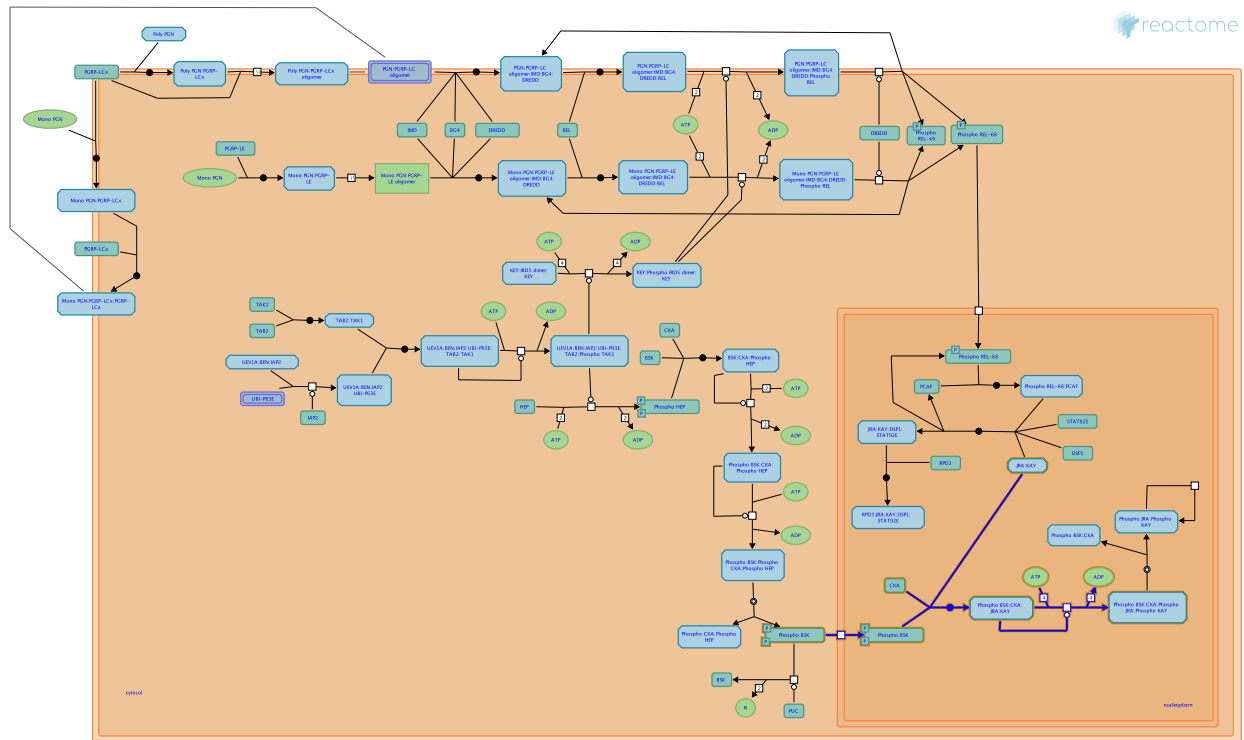


# Formation of the nuclear AP-1 transcription factor 'scaffolding complex'



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## Introduction

Reactome is open-source, open access, manually curated and peer-reviewed pathway database. Pathway annotations are authored by expert biologists, in collaboration with Reactome editorial staff and cross-referenced to many bioinformatics databases. A system of evidence tracking ensures that all assertions are backed up by the primary literature. Reactome is used by clinicians, geneticists, genomics researchers, and molecular biologists to interpret the results of high-throughput experimental studies, by bioinformaticians seeking to develop novel algorithms for mining knowledge from genomic studies, and by systems biologists building predictive models of normal and disease variant pathways.

The development of Reactome is supported by grants from the US National Institutes of Health (P41 HG003751), University of Toronto (CFREF Medicine by Design), European Union (EU STRP, EMI-CD), and the European Molecular Biology Laboratory (EBI Industry program).

## Literature references

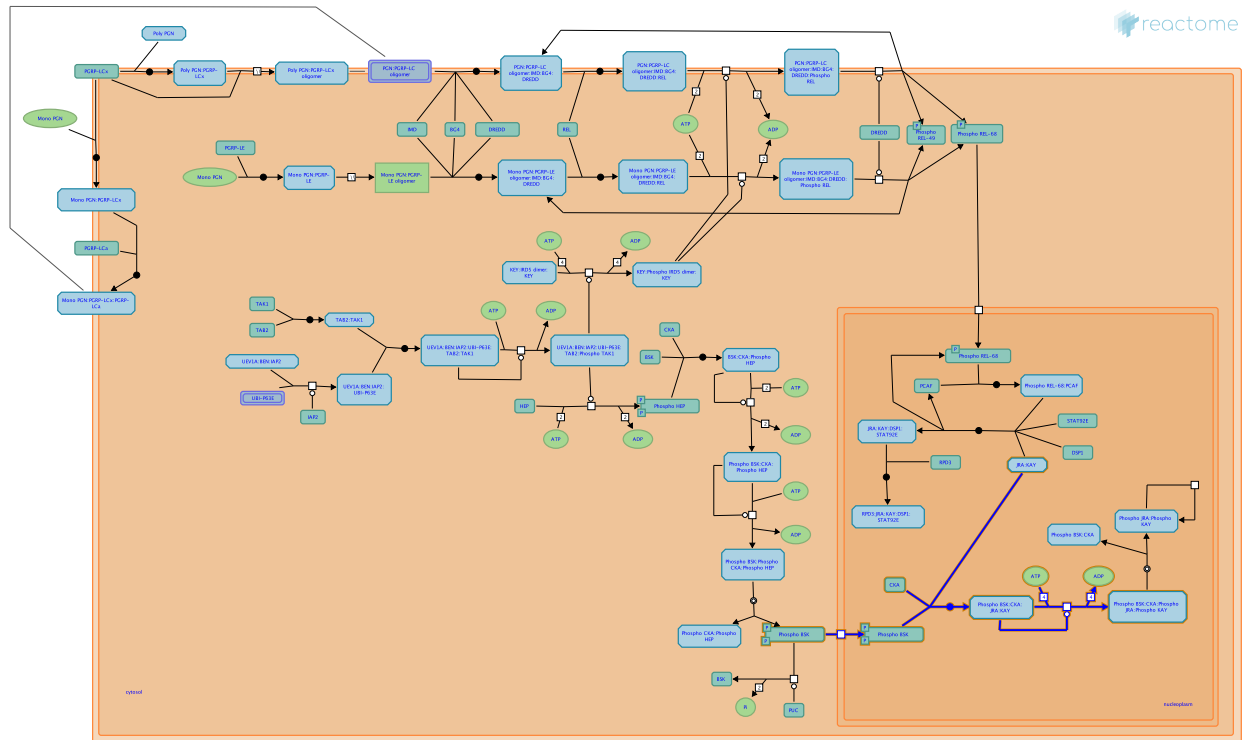
- Fabregat, A., Sidiropoulos, K., Viteri, G., Forner, O., Marin-Garcia, P., Arnau, V. et al. (2017). Reactome pathway analysis: a high-performance in-memory approach. *BMC bioinformatics*, 18, 142. [↗](#)
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- Fabregat, A., Jupe, S., Matthews, L., Sidiropoulos, K., Gillespie, M., Garapati, P. et al. (2018). The Reactome Pathway Knowledgebase. *Nucleic Acids Res*, 46, D649-D655. [↗](#)
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Reactome database release: 77

This document contains 1 pathway and 3 reactions ([see Table of Contents](#))

# Formation of the nuclear AP-1 transcription factor 'scaffolding complex' ↗

Stable identifier: R-DME-209409



Spatzle (SPZ) dimer binding leads to Toll (TL) receptor homodimerisation and activation.

## Literature references

Leclerc, V., Reichhart, JM. (2004). The immune response of *Drosophila melanogaster*. *Immunol Rev*, 198, 59-71. ↗

## Editions

2007-07-11	Authored	Williams, MG.
2007-07-12	Edited	Williams, MG.
2008-06-20	Reviewed	Lemaitre, B., Silverman, N.

## Phosphorylated BSK kinase transports from the cytosol to the nucleus ↗

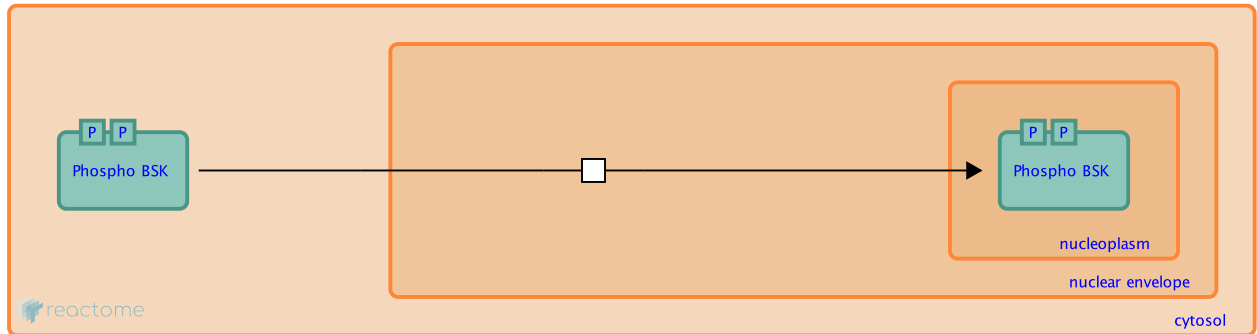
**Location:** Formation of the nuclear AP-1 transcription factor 'scaffolding complex'

**Stable identifier:** R-DME-209235

**Type:** transition

**Compartments:** nuclear envelope

**Inferred from:** Rat JNK1 kinase transports from the cytosol to the nucleus (Rattus norvegicus)



Free phosphorylated Basket (BSK) kinase is now able to translocate from the cytosol to the nucleus.

**Followed by:** Phosphorylated BSK kinase and the AP-1 transcription factor, JRA:KAY, bind to CKA scaffolding protein in the nucleus

### Editions

2007-07-11	Authored	Williams, MG.
2008-06-20	Reviewed	Lemaitre, B., Silverman, N.
2014-05-20	Edited	Williams, MG.

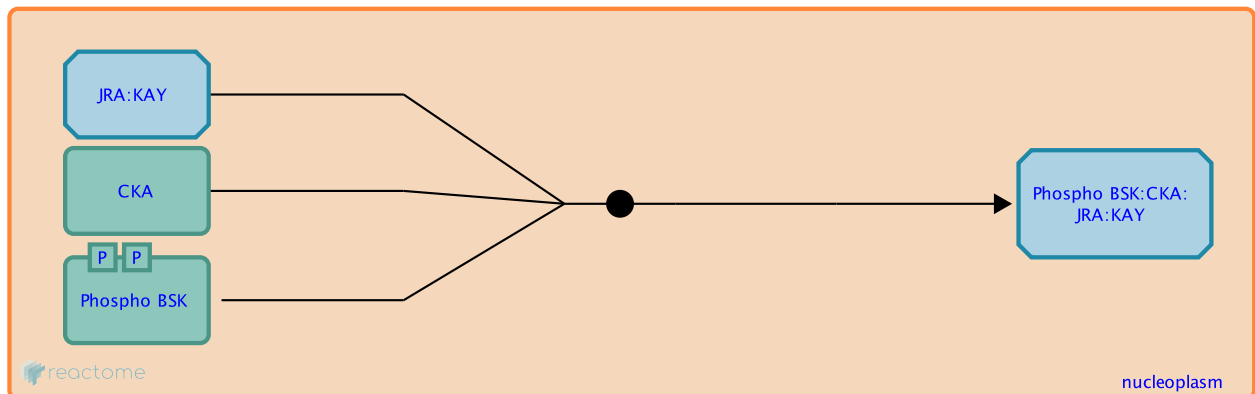
## Phosphorylated BSK kinase and the AP-1 transcription factor, JRA:KAY, bind to CKA scaffolding protein in the nucleus ↗

**Location:** [Formation of the nuclear AP-1 transcription factor 'scaffolding complex'](#)

**Stable identifier:** R-DME-209330

**Type:** binding

**Compartments:** nucleoplasm



In the nucleus, another molecule of the scaffolding protein CKA binds the phosphorylated Basket (BSK) kinase and the AP-1 transcription factor heterodimer. The latter is made up of the c-Jun orthologue, Jun-related antigen (JRA) and the c-Fos orthologue, Kayak (KAY).

**Preceded by:** [Phosphorylated BSK kinase transports from the cytosol to the nucleus](#)

**Followed by:** [AP-1 transcription factor, JRA:KAY, is phosphorylated by phosphorylated BSK kinase](#)

### Literature references

Chen, HW., Marinissen, MJ., Oh, SW., Chen, X., Melnick, M., Perrimon, N. et al. (2002). CKA, a novel multidomain protein, regulates the JUN N-terminal kinase signal transduction pathway in *Drosophila*. *Mol Cell Biol*, 22, 1792-803. ↗

### Editions

2007-07-11	Authored	Williams, MG.
2008-06-20	Reviewed	Lemaitre, B., Silverman, N.
2014-05-20	Edited	Williams, MG.

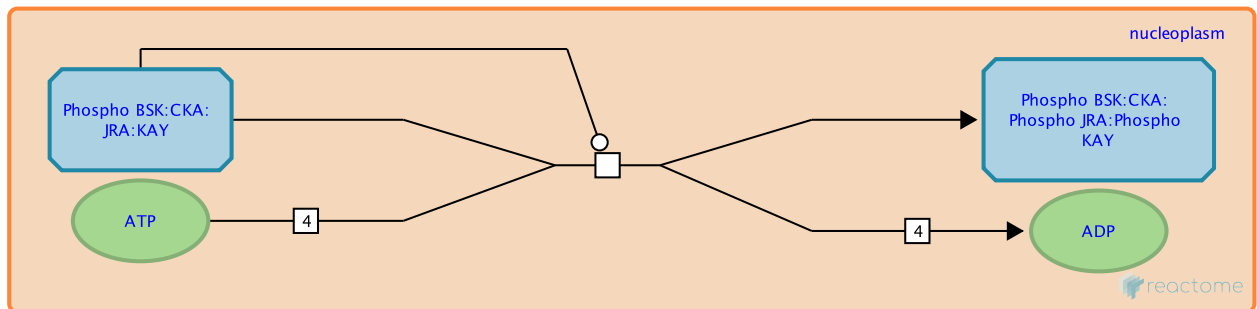
## AP-1 transcription factor, JRA:KAY, is phosphorylated by phosphorylated BSK kinase ↗

**Location:** Formation of the nuclear AP-1 transcription factor 'scaffolding complex'

**Stable identifier:** R-DME-209381

**Type:** transition

**Compartments:** nucleoplasm



Phosphorylated Basket (BSK) kinase phosphorylates residues Ser82 and Ser92 on JRA along with residues Thr216 and Thr220 on KAY.

**Preceded by:** Phosphorylated BSK kinase and the AP-1 transcription factor, JRA:KAY, bind to CKA scaffolding protein in the nucleus

### Literature references

Chen, HW., Marinissen, MJ., Oh, SW., Chen, X., Melnick, M., Perrimon, N. et al. (2002). CKA, a novel multidomain protein, regulates the JUN N-terminal kinase signal transduction pathway in *Drosophila*. *Mol Cell Biol*, 22, 1792-803. ↗

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Pulverer, BJ., Kyriakis, JM., Avruch, J., Nikolakaki, E., Woodgett, JR. (1991). Phosphorylation of c-jun mediated by MAP kinases. *Nature*, 353, 670-4. ↗

Smeal, T., Binetruy, B., Mercola, DA., Birrer, M., Karin, M. (1991). Oncogenic and transcriptional cooperation with Ha-Ras requires phosphorylation of c-Jun on serines 63 and 73. *Nature*, 354, 494-6. ↗

### Editions

2007-07-11	Authored	Williams, MG.
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