



**LPS Award was presented to
Steven J. Petesch (Lis lab) in May 2012 for
the best BMCB paper.**

[Mol Cell](#). 2012 Jan 13;45(1):64-74. Epub 2011 Dec 15.

Activator-induced spread of poly(ADP-ribose) polymerase promotes nucleosome loss at Hsp70.

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Source

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Abstract

Eukaryotic cells possess many transcriptionally regulated mechanisms to alleviate the nucleosome barrier. Dramatic changes to the chromatin structure of *Drosophila melanogaster* Hsp70 gene loci are dependent on the transcriptional activator, heat shock factor (HSF), and poly(ADP-ribose) polymerase (PARP). Here, we find that PARP is associated with the 5' end of Hsp70, and its enzymatic activity is rapidly induced by heat shock. This activation causes PARP to redistribute throughout Hsp70 loci and Poly(ADP-ribose) to concurrently accumulate in the wake of PARP's spread. HSF is necessary for both the activation of PARP's enzymatic activity and its redistribution. Upon heat shock, HSF triggers these PARP activities mechanistically by directing Tip60 acetylation of histone H2A lysine 5 at the 5' end of Hsp70, where inactive PARP resides before heat shock. This acetylation is critical for the activation and spread of PARP as well as for the rapid nucleosome loss over the Hsp70 loci.