

Cell Cycle Checkpoints

The proper timing and order of cell cycle events is critical to ensure the faithful replication of DNA into two daughter cells. The mammalian cell cycle is divided into a DNA synthesis (S) phase and a cell division or mitosis (M) phase, separated by two gap or growth phases (G1 and G2). These events are enforced by cell cycle checkpoints at each transition stage (G1 to S, S to G2, G2 to M) and within different stages of the cell cycle.

Cell cycle checkpoints are regulated by a number of different protein kinases and adaptor molecules. These checkpoint proteins act to ensure accuracy during the normal cell cycle, and many also act in response to genotoxic stress derived from endogenous or environmental sources. Endogenous sources of DNA damage result from cellular metabolism or routine errors in DNA replication and recombination. In the case of genotoxic stress, the cell cycle must be halted until DNA repair occurs and the cycle can resume.

From proteins to ELISAs, R&D Systems manufactures and supports products necessary for cell cycle research.

Phospho-p53-induction by Camptothecin

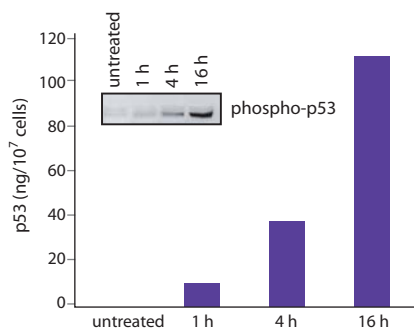


Figure 1. MCF-7 cells were left untreated or treated with 1 μ M camptothecin (CPT). Cellular extracts were prepared at the indicated times following CPT treatment. Phosphorylated p53 was quantified using R&D Systems phospho-p53 (S15) DuoSet[®] IC ELISA (Catalog # DYC1839). The same cellular extracts were immunoblotted (inset) using R&D Systems rabbit anti-phospho-p53 (S15) affinity-purified polyclonal antibody (Catalog # AF1043). The DuoSet IC results correlate well with the amounts of phospho-p53 (S15) detected by Western Blot.

Phospho-p53 (S15) Detected by Flow Cytometry

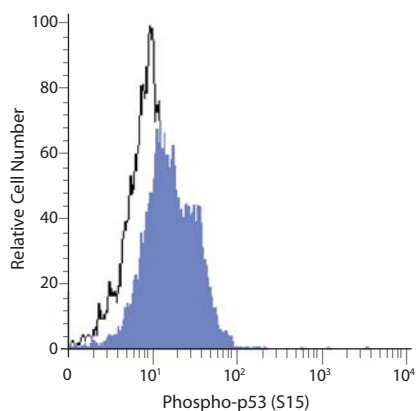


Figure 2. Phospho-p53 (S15) was detected by flow cytometry in camptothecin-stimulated MCF-7 cells using R&D Systems allophycocyanin-conjugated anti-human phospho-p53 (S15) antibody (Catalog # IC18392A; filled histogram). Control cells were also stained with R&D Systems isotype control antibody (Catalog # IC003A, open histogram).

Cell Cycle/Checkpoint-related Products			
MOLECULE	ANTIBODIES	PROTEINS	ELISA/ASSAYS
53BP1	H		
ASC	H		
ATM	H M R		H
ATRIP	H M R		
Aurora A	H		
Aurora B	H		
BARD1	H M R		
BRCA1	H M R		
BRCA2	H		
Bub-1	H		
CARF	H		
CBP	H M R		
CDC2	H M R		
CDC25A	H M R	H	
CDC25B	H M R	H	
Chk1	H M R	H	H M R
Chk2	H M R	H	H M R
Claspin	H		
DNA-PK ϵ s	H		
Frk	H M R		
Gas1	H M	H M	
GRP75/HSPA9B	H M R		
H2AX	H M R		
MAD1L1	H		
MAD2L1	H R		
MCPH1	H		
MDM2	H M R		
MgcRacGAP	H		
Mre11	H		
Nbs1	H M R		
NEK2		H	
p21/CIP1/CDKN1A	H		H
p27/Kip1	H M R		H
p53	H M R		H M
p53R2	H		
p300	H		
PA2G4	H		
Pin1	H M	H	
PLK3	H		
PLKK	X		
Rad1	H		
Rad17	H M R		H
Rheb	H M R		
SCP3/SYCP3	H		
SMC1	H M R		

Key: H Human M Mouse R Rat X Xenopus

For our complete line of products for Cell Cycle and Genotoxic Stress, please visit our website at www.RnDSystems.com