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ProductInformation

MONOCLONAL ANTI- p57^{Kip2}
CLONE KP39
Purified Mouse Immunoglobulin

Product Number **P 2735**

Product Description

Monoclonal Anti-p57^{Kip2} (mouse IgG2b isotype) is derived from the KP39 hybridoma produced by the fusion of mouse myeloma cells and splenocytes from a BALB/c mouse immunized with a recombinant human p57^{Kip2}.[1] The isotype is determined using Sigma ImmunoType™ Kit (Sigma ISO-1) and by a double diffusion immunoassay using Mouse Monoclonal Antibody Isotyping Reagents (Sigma ISO-2).

Monoclonal Anti-p57^{Kip2} specifically reacts with p57^{Kip2} and shows no cross-reaction with the closely related mitotic inhibitors p21$^{WAF1/Cip1}$ and p27^{Kip1}.[1] The antibody may be used for ELISA,[1] immunoblotting[1] (57 kDa, and additional lower and higher bands), and immunoprecipitation (weaker for mouse). Reactivity has been observed with human and mouse p57^{Kip2}.[1]

During the cell cycle of most somatic cells, DNA synthesis (S-phase) and mitosis (M-phase) are separated by two gap phases (G_1 and G_2) of varying duration. Thus, a typical eukaryotic cell sequentially passes through G_1, S, G_2, and M and back into G_1 during a single cycle.[2] Regulation of cell cycle progression in eukaryotic cells depends on the expression of proteins called cyclins.[3] These proteins form complexes with several different cyclin dependent kinases (CDKs). Within the complexes, the cyclin subunit serves a regulatory role, whereas the CDKs have a catalytic protein kinase activity.[4] Complexes of cyclins and CDKs play a key role in cell cycle control. The eukaryotic cell cycle is regulated by the sequential activation of CDKs. The association of members of the cyclin family with the kinase subunit forms an active kinase. These kinases can initiate M phase of mitosis and meiosis, or function as key regulators of each step of the cell cycle by phosphorylation of several cellular targets.

The catalytic activity of CDKs is regulated by two general mechanisms: protein phosphorylation and association with regulatory subunits, which include the cyclins and the CDK inhibitors (CKIs). Two families of CKIs have been identified. The p21$^{WAF1/Cip1}$ family contains p21$^{WAF1/Cip1}$, p27^{Kip1} and p57^{Kip2} and inhibits all kinases involved in the G_1/S transition, whereas the p16^{INK4a} family, including p15^{INK4b}, p16^{INK4a}, p18^{INK4c} and p19^{INK4d} inhibits Cdk4 and Cdk6 specifically.[5]

The biochemical activities and patterns of expression of CKIs during development, together with data derived from *in vitro* differentiation systems, implicate these proteins as the primary effectors of signaling pathways that control cell cycle exit, an event that is critical for differentiation. Studies have shown that p57^{Kip2} (57 kDa, also designated Kip2 p57) binds tightly to the G_1 and S phase kinases, cyclin E/Cdk2, cyclin D2/Cdk4, and cyclin A/Cdk2, and to a lesser extent to cyclin B/Cdc2, and effectively inhibits their activity.[6] In mammalian cells, p57^{Kip2} localizes to the nucleus and associates with G_1 CDK components. Its overexpression causes a complete cell cycle arrest in G_1 phase. In contrast to the widespread expression of p21$^{WAF1/Cip1}$ and p27^{Kip1} in human tissues, p57^{Kip2} is expressed in a tissue-specific manner,[6] and is not regulated by p53.[7] The availability of a monoclonal antibody reacting specifically with p57^{Kip2} enables the subcellular detection and localization of p57^{Kip2} and the measurement of relative differences in p57^{Kip2} levels as a function of cell cycle phase.

Reagent

Monoclonal Anti-p57^{Kip2} is supplied as a solution in 0.01 M phosphate buffered saline, pH 7.4, containing 15 mM sodium azide.

Antibody Concentration: Approx. 2 mg/ml.

Precautions and Disclaimer
Due to the sodium azide content a material safety sheet (MSDS) for this product has been sent to the attention of the safety officer of your institution.
Consult the MSDS for information regarding hazards and safe handling practices.

Storage/Stability
For continuous use, store at 2 °C to 8 °C for up to one month. For extended storage, freeze in working aliquots. Repeated freezing and thawing is not recommended. Storage in "frost-free" freezers is not recommended. If slight turbidity occurs upon prolonged storage, clarify the solution by centrifugation before use. Working dilution samples should be discarded if not used within 12 hours.

Product Profile
A working concentration of 5 µg/ml to 10 µg/ml is determined by immunoblotting using a HeLa cell nuclear extract.

Note: In order to obtain best results in different techniques and preparations we recommend determining optimal working concentration by titration test.

References

1. Dynlacht, B.D., et al., Meth. Enzymol., **283**, 230-244 (1997).
2. Freeman, R.S., and Donoghue, D.J., Biochemistry, **30**, 2293-2302 (1991).
3. Pines, J., and Hunter, T., J. Cell Biol., **115**, 1-17 (1991).
4. Yamashita, M., et al., Dev. Growth Differ., **33**, 617-624 (1991).
5. Harper, J.W., and Elledge, S.J., Curr. Opin. Genet. Dev., **6**, 56-64 (1996).
6. Lee, M.-H., et al., Genes Dev., **9**, 639-649 (1995).
7. Matsuoka, S., et al., Genes Dev., **9**, 650-662 (1995).

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