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Product Information

MONOCLONAL ANTI-CYCLIN D₂

Clone DCS-3

Mouse Ascites Fluid

Product Number **C 7339**

Product Description

Monoclonal Anti-Cyclin D₂ (mouse IgG2a isotype) is derived from the DCS-3 hybridoma produced by the fusion of mouse myeloma cells and splenocytes from an immunized mouse. Recombinant cyclin D₂ protein of human origin was used as the immunogen.¹ The isotype is determined using Sigma ImmunoType™ Kit (Product Code ISO-1) and by a double diffusion immunoassay using Mouse Monoclonal Antibody Isotyping Reagents (Product Code ISO-2).

During the cell cycle of most somatic cells, DNA synthesis (S-phase) and mitosis (M-phase) are separated by two gap phases (G₁ and G₂) of varying duration. Thus, a typical eukaryotic cell sequentially passes through G₁, S, G₂, and M and back into G₁ during a single cycle.³ Regulation of cell cycle progression in eukaryotic cells depends on the expression of cyclin proteins.⁴ These proteins are the regulatory subunits of the cyclin dependent kinases (CDKs), which are responsible for the phosphorylation of several cellular targets. Complexes of cyclins and CDKs play a key role in cell cycle control. Within the complexes, the cyclin subunit serves a regulatory role, whereas CDKs have a catalytic protein kinase activity.⁵ Members of the cyclin family of proteins combine with a CDK subunit to form the active kinase, which initiates G₂ to M or G₁ to S transition. The latter are controlled by cyclins, termed G₁ cyclins, which commit the cell to DNA replication. Therefore, the cell cycle can be considered as a cyclin cycle which is controlled by biochemical modifications and formation of complex(es) with CDKs.⁶ At least five candidate G₁-phase cyclins, termed cyclins C, D₁, D₂, D₃, and E have been identified in mammalian cells. Each of these cyclins can associate with one or more of the CDK family members. D-type cyclins are induced during the G₁ phase of the mammalian cell cycle in response to a variety of mitogenic growth factors. The three distinct members of the D-type cyclin family are differentially and combinatorially expressed in various cell lineages. Once induced, the D-type cyclins accumulate in complexes with CDKs, whose kinase activity is thought to be necessary for driving cells into S phase. The

major catalytic partners of the D-type cyclins are CDK4 and CDK6 but at least some D-type cyclins also interact with other CDKs including CDK2 and CDK5. Cyclin D₁- and D₂-associated CDK4 and/or CDK6 kinase activities have been detected in mid-G₁, prior to the activation of any other known CDK, and they culminate in late G₁ phase. The cyclin D₃-associated CDK4 and/or CDK6 exhibit kinase activities at the G₁/S transition. Cyclins D₁, D₂ and D₃ can be distinguished by their slightly different mobilities on denaturing gels. Under these conditions, the apparent masses are 36, 33-35, and 31-34 kDa for cyclins D₁, D₂ and D₃, respectively. Because D-type cyclins probably serve as integrators of growth factor-induced signals with the cell cycle clock, aberrant expression of these proteins might play a role in disrupting the normal timing of events governing G₁ progression and, in so doing, contribute to oncogenesis. Indeed, a link between tumor formation and inappropriate expression of cyclins has been established.^{7,8} Immunochemical techniques provide a convenient and sensitive method for detection of these cyclins in human tumor tissues. Such assays facilitate clinical studies directed toward correlating the phenotypic subtypes and aggressiveness of particular human tumors known to exhibit cyclin D₁ overexpression and enable studies with other types in which cyclins D₂ and D₃ are similarly implicated in pathogenesis. The availability of monoclonal antibody reacting specifically with cyclin D₂ enables the subcellular detection and localization of cyclin D₂ and the measurement of relative differences in cyclin D₂ levels as a function of cell cycle phase.

Reagents

The product is provided as ascites fluid with 0.1% sodium azide as a preservative.

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 hazardous and safe handling practices.

Storage/Stability

For continuous use, store at 2-8 °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.

Product Profile

Monoclonal Anti-Cyclin D₂ recognizes cyclin D₂ (33-35 kDa, and several lower and higher m.w. proteins) in immunoblotting,¹ ELISA, immunocyto-chemistry,¹ immunoprecipitation,¹ and flow cytometry procedure.^{1,2} The antibody is useful in antibody-mediated knock-out experiments.^{1,2} Cross-reactivity has been observed with human^{1,2} and mouse cyclin D₂. The product does not cross-react with other D-type cyclins.¹

Monoclonal Anti-Cyclin D₂ may be used for the localization of Cyclin D₂ in various immunochemical assays such as immunoblotting, ELISA, immunocytochemistry, immunoprecipitation, flow cytometry, and antibody-mediated knock-out experiments.

In order to obtain best results, it is recommended that each user determine the optimal working dilution for individual applications by titration assay.

References

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