

## Product Information

### ANTI- $\beta$ -CATENIN

Developed in Rabbit  
Delipidized, Whole Antiserum

Product No. **C 2206**

#### Product Description

Anti- $\beta$ -Catenin is developed in rabbit using a synthetic peptide (Pro-Gly-Asp-Ser-Asn-Gln-Leu-Ala-Trp-Phe-Asp-Thr-Asp-Leu) conjugated to KLH as immunogen. The peptide corresponds to amino acids 768-781 of human or mouse  $\beta$ -catenin. The antiserum has been treated to remove lipoproteins.

The distinct peripheral cytosolic proteins,  $\alpha$ -,  $\beta$ - and  $\gamma$ -catenin (102 kDa, 94 kDa and 86 kDa respectively), are found in varying abundance in many developing and adult tissues.<sup>1,2,3</sup> The catenins bind, directly or indirectly, to the conserved cytoplasmic tail domain of the cell-adhesion cadherins. Cadherins are transmembrane cell surface glycoprotein molecules, concentrated at adherens junctions that mediate calcium-dependent intercellular interactions and are important for tissue morphogenesis.<sup>4</sup> The linkage of the epithelial E-cadherin/uvomorulin to actin is essential for the cell binding function of this cadherin. Catenins also link E-cadherin to other integral membrane proteins such as Na<sup>+</sup>/K<sup>+</sup>-ATPase, or to cytoplasmic proteins such as fodrin, ankyrin, Src and Yes kinases<sup>5</sup> and are modulated by Wnt-1 protooncogene.<sup>6,7</sup> They are considered good candidates for mediating transduction of cell-cell contact positional signals to the cell interior.<sup>4,5</sup> Within its conserved regions  $\alpha$ -catenin shows 30% identity to vinculin, a protein found mainly in focal cell-cell and cell substrate adhesions.<sup>2,3</sup> Vinculin is known to interact with a-actinin, which in turn is associated with actin filaments in their site of attachment to the cell membrane focal contacts. The protein,  $\alpha$ -catenin, is capable of interacting with N-cadherin and P-cadherin. Absence of  $\alpha$ -catenin is found in certain tumor cell lines.<sup>8</sup> Frequent reduction of  $\alpha$ -catenin levels in human carcinomas of the esophagus, stomach and colon is reported<sup>9</sup> Enhancement of tumor cell invasion and metastatic ability of such cells following catenins down-regulation is speculated. Prostate cancer development appears to be correlated with  $\alpha$ -catenin gene deletions.

Plakoglobin (probably identical to  $\gamma$ -catenin) and  $\beta$ -catenin are structural and possibly functional mammalian homologues of armadillo (arm), a *Drosophila* protein involved in signal transduction. The protein,  $\beta$ -catenin, binds directly to the cytoplasmic tail of E-cadherin. It binds to the amino terminus of  $\alpha$ -catenin and also interacts with the cytosolic protein product of the human tumor suppressor gene APC.<sup>10</sup> Mutations in this gene occur early in colon carcinogenesis. Such mutations are linked to familial adenomatous polyposis and to progression of sporadic colorectal and gastric tumors. The preferential interaction of  $\beta$ -catenin with the APC protein involves a 15-amino acid repeat in the latter<sup>11</sup> and  $\beta$ -catenin cell levels seem to be controlled by APC.<sup>12</sup> The central core region of  $\beta$ -catenin is involved in mediation of the interaction of cadherin-catenin complex with the epidermal growth factor receptor.<sup>13</sup> The protein,  $\beta$ -catenin, is the target of two signal transduction pathways mediated by the protooncogenes Src and Wnt-1. p120<sup>cas</sup> which exhibits structural similarity to  $\beta$ -catenin and plakoglobin may represent another catenin associated with cadherin.<sup>14</sup> Polyclonal antibodies against defined type-specific catenin peptides are useful tools for the study of these proteins. Such antibodies recognize the respective catenin type in a variety of immunological techniques such as immunoprecipitation, immunoblotting, immunofluorescence and immunoperoxidase in different cell types from various species.

#### Reagent

Rabbit Anti- $\beta$ -Catenin is supplied as a liquid containing 15 mM 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.

### Specificity

Anti- $\beta$ -Catenin reacts in dot blot immunoassay with  $\beta$ -catenin peptide amino acids 768-781 conjugated to BSA. It reacts with a 94 kDa protein in extracts of Madin-Darby Bovine Kidney (MDBK) cultured cell line using immunoblotting. The antiserum shows no cross-reactivity with  $\alpha$ -catenin peptide (amino acids 890-901) conjugated to BSA. The antibody stains  $\beta$ -catenin in frozen sections and cultured MDBK epithelial cells. Specific staining in immunoblotting is inhibited following preincubation of the diluted antiserum with the  $\beta$ -catenin peptide.

### Working Dilution

1. A minimum working dilution of 1:2,000 was determined by indirect immunohistology using bovine kidney frozen sections.
2. A minimum working dilution of 1:2,000 was determined by indirect immunohistology using cultured MDBK cells.
3. A minimum working dilution of 1:4,000 was determined by indirect immunoblotting using cultured MDBK cells extract.

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

### Uses

Rabbit Anti- $\beta$ -Catenin may be used for the immunolocalization of  $\beta$ -catenin by immunohistology methods using frozen tissue sections and cultured cells. It may be used to detect  $\beta$ -catenin by other immunoassays including dot blot immunoassay and immunoblotting.

### Storage

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.

### References

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