

# CDX2 [BC39]

Concentrated and Prediluted Monoclonal Antibody  
901-3184-091817

**BIOCARE**  
M E D I C A L

Catalog Number:	ACI 3184 A, C	API 3184 AA	AVI 3184 G
Description:	0.1, 1.0 ml, concentrated	6.0 ml, prediluted	6.0 ml, prediluted
Dilution:	1:100	Ready-to-use	Ready-to-use
Diluent:	Van Gogh Yellow	N/A	N/A

## Intended Use:

For In Vitro Diagnostic Use

CDX2 [BC39] is a mouse monoclonal antibody that is intended for laboratory use in the qualitative identification of CDX2 protein by immunohistochemistry (IHC) in formalin-fixed paraffin-embedded (FFPE) human tissues. The clinical interpretation of any staining or its absence should be complemented by morphological studies using proper controls and should be evaluated within the context of the patient's clinical history and other diagnostic tests by a qualified pathologist.

## Summary and Explanation:

CDX2 is a homeobox gene that encodes an intestine-specific transcription factor and is expressed in the nuclei of epithelial cells of the intestine, from duodenum to rectum. The CDX2 protein is expressed in primary and metastatic colorectal carcinomas (1,2). It has also been identified in primary ovarian mucinous tumors and metastatic mucinous carcinomas involving the ovary (3). Studies have shown that the CDX2 marker is a more specific and sensitive marker when compared to CK20 (4). According to in-house studies, CDX2 [BC39] showed equal or superior sensitivity to clone CDX2-88, with virtually identical specificity.

## Principle of Procedure:

Antigen detection in tissues and cells is a multi-step immunohistochemical process. The initial step binds the primary antibody to its specific epitope. A secondary antibody may be applied to bind the primary antibody, followed by an enzyme labeled polymer; or an enzyme labeled polymer may be applied directly to bind the primary antibody. The detection of the bound primary antibody is evidenced by an enzyme-mediated colorimetric reaction.

**Source:** Mouse monoclonal

**Species Reactivity:** Human; others not tested

**Clone:** BC39

**Isotype:** IgG1/kappa

**Total Protein Concentration:** ~10 mg/ml. Call for lot specific Ig concentration.

**Epitope/Antigen:** CDX2

**Immunogen:** Human CDX2 recombinant protein (aa106-305)

**Cellular Localization:** Nuclear

**Positive Tissue Control:** Colon cancer

## Known Applications:

Immunohistochemistry (formalin-fixed paraffin-embedded tissues)

**Supplied As:** Buffer with protein carrier and preservative

## Storage and Stability:

Store at 2°C to 8°C. Do not use after expiration date printed on vial. If reagents are stored under conditions other than those specified in the package insert, they must be verified by the user. Diluted reagents should be used promptly; any remaining reagent should be stored at 2°C to 8°C.

## Protocol Recommendations (manual use):

**Peroxide Block:** Block for 5 minutes with Biocare's Peroxidized 1.

**Pretreatment:** Perform heat retrieval using Biocare's Diva Decloaker. Refer to the Diva Decloaker data sheet for specific instructions.

**Protein Block (Optional):** Incubate for 5-10 minutes at RT with Biocare's Background Punisher.

**Primary Antibody:** Incubate for 30 minutes at RT.

**Probe:** Incubate for 10 minutes at RT with a secondary probe.

**Polymer:** Incubate for 10-20 minutes at RT with a tertiary polymer.

**Chromogen:** Incubate for 5 minutes at RT with Biocare's DAB – OR – Incubate for 5-7 minutes at RT with Biocare's Warp Red.

## Counterstain:

Counterstain with hematoxylin. Rinse with deionized water. Apply Tacha's Bluing Solution for 1 minute. Rinse with deionized water.

## Protocol Recommendations (Ventana BenchMark ULTRA) using ultraView:

Refer to the User Manual for specific instructions for use. Recommended protocol parameters are as follows:

**Template:** U ultraView DAB

**Pretreatment Protocol:** ULTRA CC1 Extended (92 min) at 95°C

**Primary Antibody:** Incubate for 32 minutes at 37°C

**Detection:** ultraView

## Protocol Recommendations (Ventana BenchMark ULTRA) using OptiView:

Refer to the User Manual for specific instructions for use. Recommended protocol parameters are as follows:

**Template:** U OptiView DAB IHC

**Pretreatment Protocol:** ULTRA CC1 32 minutes at 100°C

**Peroxidase:** Pre Primary Peroxidase Inhibitor

**Primary Antibody:** Incubate for 16 minutes at 36°C

**Detection:** OptiView

## Technical Note:

This antibody has been standardized with Biocare's MACH 4 detection system. Use TBS buffer for washing steps.

## Performance Characteristics:

Sensitivity and specificity on diseased tissue and tissue cross-reactivity on normal tissue is summarized in Tables 1 and 2, respectively.

## Limitations:

The optimum antibody dilution and protocols for a specific application can vary. These include, but are not limited to fixation, heat-retrieval method, incubation times, tissue section thickness and detection kit used. Due to the superior sensitivity of these unique reagents, the recommended incubation times and titers listed are not applicable to other detection systems, as results may vary. The data sheet recommendations and protocols are based on exclusive use of Biocare products. Ultimately, it is the responsibility of the investigator to determine optimal conditions. The clinical interpretation of any positive or negative staining should be evaluated within the context of clinical presentation, morphology and other histopathological criteria by a qualified pathologist. The clinical interpretation of any positive or negative staining should be complemented by morphological studies using proper positive and negative internal and external controls as well as other diagnostic tests.

## Quality Control:

Refer to CLSI Quality Standards for Design and Implementation of Immunohistochemistry Assays; Approved Guideline-Second edition (I/LA28-A2) CLSI Wayne, PA USA (www.clsi.org). 2011

## Precautions:

1. This antibody contains less than 0.1% sodium azide. Concentrations less than 0.1% are not reportable hazardous materials according to U.S. 29 CFR 1910.1200, OSHA Hazard communication and EC Directive 91/155/EC. Sodium azide (NaN<sub>3</sub>) used as a preservative is toxic if ingested. Sodium azide may react with lead and copper plumbing to form highly explosive metal azides. Upon disposal, flush with large volumes of water to prevent azide build-up in plumbing. (Center for Disease Control, 1976, National Institute of Occupational Safety and Health, 1976) (5)
2. Specimens, before and after fixation, and all materials exposed to them should be handled as if capable of transmitting infection and disposed of with proper precautions. Never pipette reagents by mouth and avoid contacting the skin and mucous membranes with reagents and specimens. If reagents or specimens come into contact with sensitive areas, wash with copious amounts of water. (6)
3. Microbial contamination of reagents may result in an increase in nonspecific staining.

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## Precautions Cont'd:

4. Incubation times or temperatures other than those specified may give erroneous results. The user must validate any such change.
5. Do not use reagent after the expiration date printed on the vial.
6. The SDS is available upon request and is located at <http://biocare.net>.

## Troubleshooting:

Follow the antibody specific protocol recommendations according to data sheet provided. If atypical results occur, contact Biocare's Technical Support at 1-800-542-2002.

## References:

1. Werling RW, *et al.* CDX2, a highly sensitive and specific marker of adenocarcinomas of intestinal origin: an immunohistochemical survey of 476 primary and metastatic carcinomas. *Am J Surg Pathol.* 2003 Mar;27(3):303-10.
2. Barbareschi M, *et al.* CDX-2 homeobox gene expression is a reliable marker of colorectal adenocarcinoma metastases to the lungs. *Am J Surg Pathol.* 2003 Feb;27(2):141-9.
3. Bayrak R, *et al.* The value of CDX2 and cytokeratins 7 and 20 expression in differentiating colorectal adenocarcinomas from extraintestinal gastrointestinal adenocarcinomas: cytokeratin 7-/20+ phenotype is more specific than CDX2 antibody. *Diagn Pathol.* 2012 Jan 23;7:9.
4. Vang R, *et al.* Immunohistochemical expression of CDX2 in primary ovarian mucinous tumors and metastatic mucinous carcinomas involving the ovary: comparison with CK20 and correlation with coordinate expression of CK7. *Mod Pathol.* 2006 Nov;19(11):1421-8.
5. Center for Disease Control Manual. Guide: Safety Management, NO. CDC-22, Atlanta, GA. April 30, 1976 "Decontamination of Laboratory Sink Drains to Remove Azide Salts."
6. Clinical and Laboratory Standards Institute (CLSI). Protection of Laboratory Workers from Occupationally Acquired Infections; Approved Guideline-Fourth Edition CLSI document M29-A4 Wayne, PA 2014.

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**Table 1:** Sensitivity and specificity was determined by testing formalin-fixed, paraffin-embedded diseased tissues.

Tissue	Positive Cases	Total Cases
Bladder Cancer	0	63
Breast Cancer	0	48
Colon Cancer	46	50
Kidney Cancer	0	12
Liver Cancer	0	64
Lung Cancer	1	72
Melanoma	0	24
Ovarian Cancer	3	12
Prostate Cancer	0	48
Testicular Cancer	0	12

**Table 2:** Tissue cross-reactivity was determined by testing formalin-fixed, paraffin-embedded normal tissues.

Tissue	Positive Cases	Total Cases
Cerebellum	0	1
Cerebral Cortex	0	1
Pituitary	0	1
Adrenal Gland	0	1
Thymus	0	1
Tonsil	0	1
Thyroid	0	1
Esophagus	0	1
Stomach	0	1
Small Intestine	1	1
Colon	1	1
Appendix	1	1
Pancreas	0	1
Spleen	0	1
Ovary	0	1
Cervix	0	1
Endomyometrium	0	1
Fallopian Tube	0	1
Placenta	0	1
Kidney	0	1
Bladder	0	1
Urethra	0	1
Breast	0	1
Prostate	0	1
Testis	0	1
Myocardium	0	1
Smooth Muscle	0	1
Skeletal Muscle	0	1
Lymph Node	0	1
Aorta	0	1
Bone Marrow	0	1
Lung	0	1
Skin	0	1
Liver	0	1