

New Clone on the Block:
An IHC Comparative Analysis of
p16 Clones BC42 and E6H4

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While p16 clone E6H4 is widely known, a new clone of p16 has emerged on the market with increasing popularity. Biocare Medical's anti-p16 INK4a antibody [clone BC42] has been developed with high staining sensitivity and specificity. To demonstrate this clone's high-quality, a comparison study between clones BC42 and E6H4 was performed to assess sensitivity on cervical cancers and specificity on various normal and neoplastic tissues. In both normal and neoplastic tissues, the clones exhibited concordant staining regarding sensitivity and specificity.

“Notably, clone BC42 showed nearly identical specificity and sensitivity, along with staining pattern, in: cervical adenocarcinoma (22 cases); cervical intraepithelial neoplasia (CIN) (24 cases); cervical squamous carcinoma (16 cases); head and neck cancer (12 cases) and endometrium carcinoma (48 cases)”.¹

p16 INK4a protein is an inhibitor of cyclin-dependent kinases (CDK) and is a specific inhibitor of CDK4 and CDK6. It is involved in cellular senescence, apoptosis and DNA repair.¹ P16 INK4a decelerates cell division by slowing the progression of the cell cycle from the G1 phase to the S phase, thereby acting as a tumor suppressor, and any mutation or deficiency in functionality may lead to carcinogenesis.² Homozygous deletions, nonsense, missense, or frameshift mutations to the p16 INK4a gene have been observed in several human cancers. Significant subsets of clinical cases with aberrant p16 INK4a gene have been reported among melanomas, gliomas, esophageal, pancreatic, lung, and urinary bladder carcinomas.¹ In paraffin- embedded tissue, p16 immunoreactivity has also been shown to be an,

“independent predictor in minimally invasive urothelial bladder cancer, a prognostic factor in non-small cell lung carcinoma; and has been shown to predict a positive response to chemoradiotherapy in Stage IV head and neck squamous cell carcinoma”.¹

Additionally, p16 is notoriously known for serving as a biomarker to aid in the accurate diagnosis of cervical intraepithelial neoplasia.

Interested in testing p16 clone BC42 in your lab? p16 (Catalog Core Number 3231) is available in multiple formats (concentrate, predilute, and instrument specific predilute) and protocol recommendations are available for most IHC instruments, including Biocare's VALENT®, intelliPATH FLX®, and Ventana's BenchMark ULTRA®.

Whether you're switching from a different vendor or interested in bringing in p16 as a new marker to your lab, our friendly staff is here to assist you in making sure your run is perfectly optimized to meet laboratory needs. Please contact Biocare anytime at 800-799-9499 or click the link here: <https://biocare.net/product/p16-antibody/>

1. Diaz, J *et al.*, “A New and Innovative Antibody p16 INK4a [BC42]: An IHC Comparative Analysis with Clone [E6H4]”. National Society for Histotechnology, Ernest N. Morial Convention Center. 20 September 2019. Poster Presentation.

2. “p16.” Wikipedia, 16 April 2020, <https://en.wikipedia.org/wiki/P16>

Table 1 - BC42 and E6H4 comparison staining of various normal tissues

Normal Tissue Cross-Reactivity					
Tissue	Total Cases	BC42 Positive	% Positive	E6H4 Positive	% Positive
Cerebrum	3	3	100.00%	3	100.00%
Cerebellum	3	3	100.00%	3	100.00%
Adrenal	3	3	100.00%	3	100.00%
Ovary	3	2	66.70%	2	66.70%
Pancreas	3	3	100.00%	3	100.00%
Parathyroid	3	1	33.30%	1	33.30%
Pituitary	3	3	100.00%	3	100.00%
Testis	3	0	0.00%	0	0.00%
Thyroid	3	0	0.00%	0	0.00%
Breast	3	3	100.00%	3	100.00%
Spleen	3	3	100.00%	3	100.00%
Tonsil	3	3	100.00%	3	100.00%
Thymus	3	3	100.00%	3	100.00%
Bone Marrow	3	3	100.00%	3	100.00%
Lung	3	0	0.00%	0	0.00%
Heart	3	0	0.00%	0	0.00%
Esophagus	3	2	66.70%	2	66.70%
Stomach	3	3	100.00%	3	100.00%
Small Intestine	3	2	66.70%	3	100.00%
Colon	3	1	33.30%	1	33.30%
Liver	3	1	33.30%	1	33.30%
Salivary Gland	3	3	100.00%	3	100.00%
Kidney	3	2	66.70%	2	66.70%
Prostate	3	3	100.00%	3	100.00%
Uterus	3	2	66.70%	2	66.70%
Cervix	3	1	33.30%	1	33.30%
Skeletal Muscle	2	0	0.00%	0	0.00%
Skin	3	3	100.00%	2	66.70%
Peripheral Nerve	3	1	33.30%	3	100.00%
Linging Cells	3	*	N/A	*	N/A

* + in lung; - in muscle & fat

Table 2 - BC42 and E6H4 comparison staining of various neoplastic tissues

Diseased Tissue Specificity and Sensitivity					
Tissue	Total Cases	BC42 Positive	% Positive	E6H4 Positive	% Positive
Cervical intraepithelial neoplasia	24	16	66.70%	16	66.70%
Cervical adenocarcinoma	22	13	59.10%	12	54.50%
Cervix squamous cell carcinoma	16	16	100.00%	16	100.00%
Head and neck cancer	12	4	33.30%	4	33.30%
Bladder Cancer	39	28	71.80%	28	71.80%
Breast Cancer	29	26	89.70%	26	89.70%
Colon Cancer	35	28	80.00%	28	80.00%
Lung Cancer	48	25	52.10%	26	54.20%
Endometrium cancer	48	42	87.50%	43	89.60%
Ovarian Cancer	12	10	83.30%	10	83.30%
Prostate Cancer	12	10	83.30%	10	83.30%
Renal Cancer	30	21	70.00%	21	70.00%

Figures 1-6 shows several examples of staining of Cervical Intraepithelial Neoplasia (CIN) cell carcinoma, Cervical Squamous Cell Carcinoma, Cervical Adenocarcinoma, Head and Neck Cancer, Endometroid carcinoma and Colon Adenocarcinoma by BC42, in comparison to staining with E6H4, on a serial section of the same specimen.

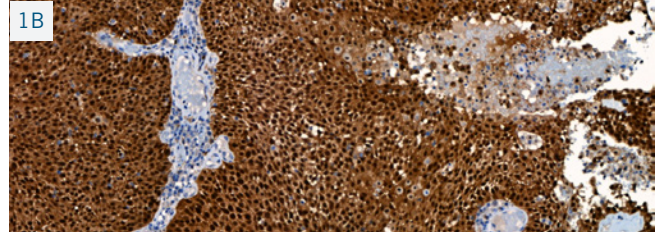
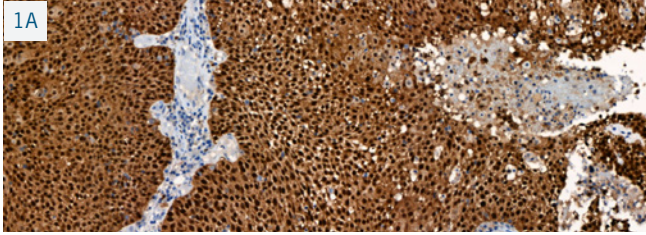


Figure 1: Cervical Intraepithelial Neoplasia (grade 3); 1A: Stained with BC42; 1B: Stained with E6H4 (Serial section of same case, 1A)

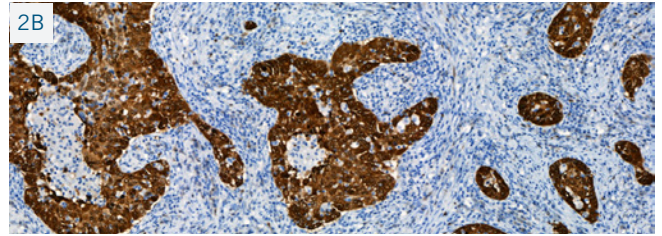
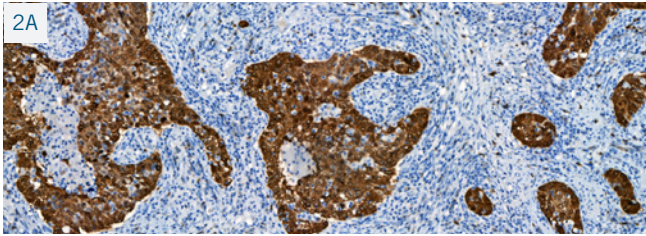


Figure 2: Cervical Squamous Cell Carcinoma (grade 3); 2A: Stained with BC42; 2B: Stained with E6H4 (Serial section of same case, 2A)

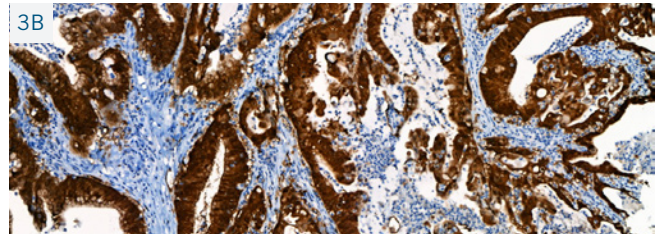
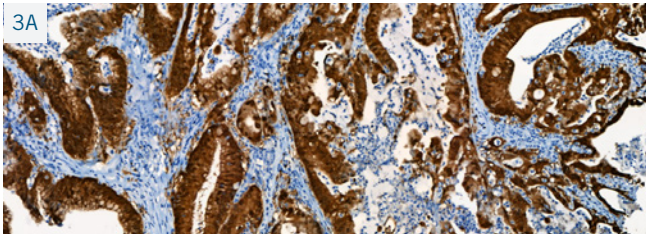


Figure 3: Cervical Adenocarcinoma (grade 2); 3A: Stained with BC42; 3B: Stained with E6H4 (Serial section of same case, 3A)

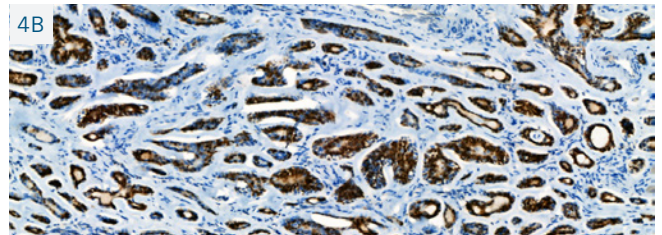
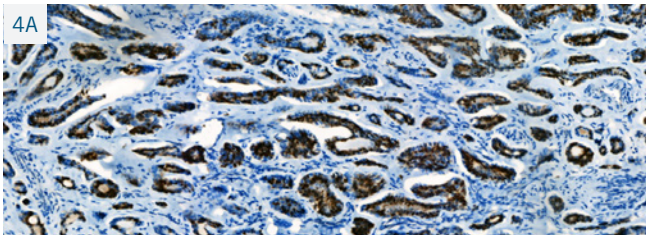


Figure 4: Salivary Gland (adenoid cystic carcinoma); 4A: Stained with BC42; 4B: Stained with E6H4 (Serial section of same case, 4A)

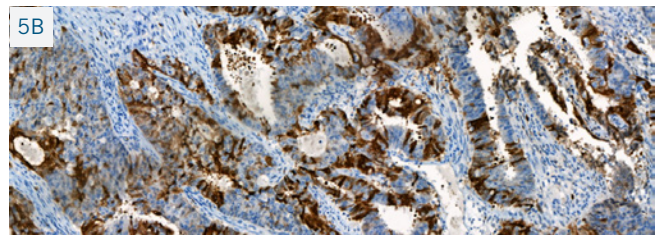
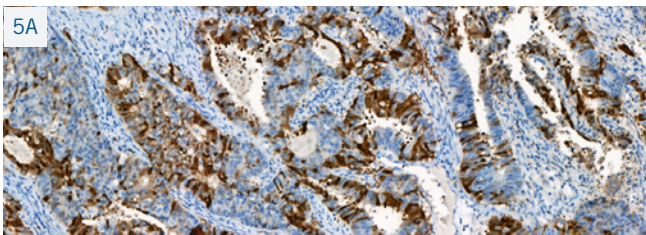


Figure 5: Endometroid Carcinoma (grade 2); 5A: Stained with BC42; 5B: Stained with E6H4 (Serial section of same case, 5A)

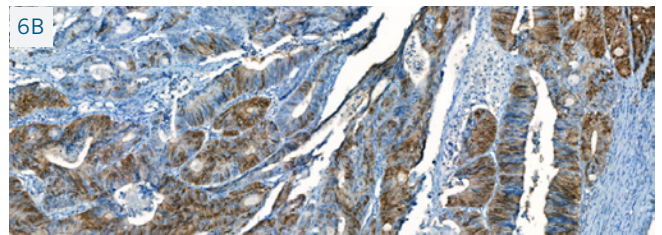
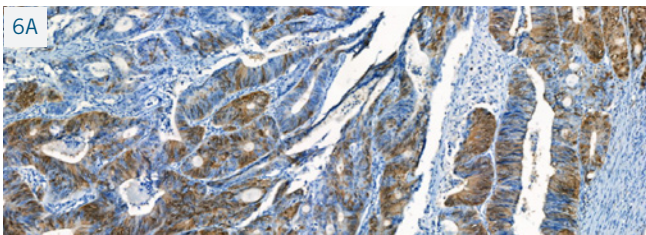


Figure 6: Colon Adenocarcinoma (grade 2); 6A: Stained with BC42; 6B: Stained with E6H4 (Serial section of same case, 6A)