

| Meet the Marker- CA-9

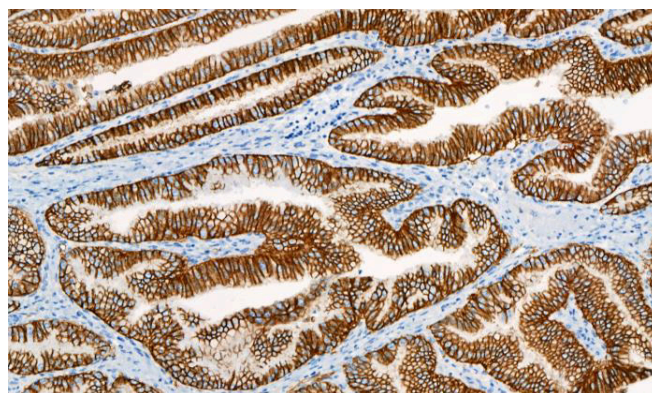
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Human cells depend on oxygen and nutrients carried by the bloodstream to survive, and so, as healthy, normal tissue grows, its blood supply grows with it. In cases of cancer, the rapid, disorganized growth of cancer cells often outstrips its blood supply, creating a hypoxic environment. CA9 serves as a marker for this hypoxic state.

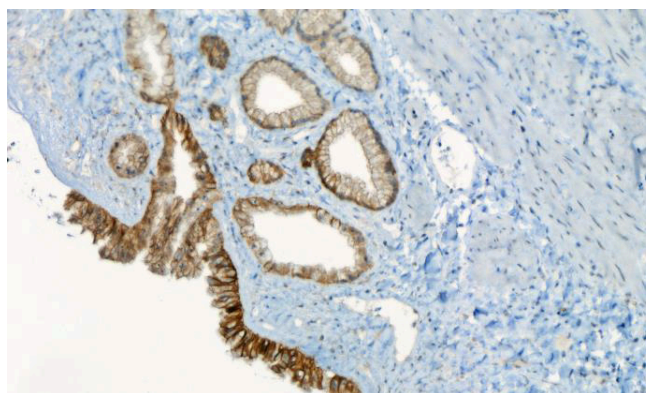
CA9 (Carbonic anhydrase IX) is a transmembrane protein and metalloenzyme that shows increased expression in hypoxic environments.^{1,2} Hypoxia is considered a hallmark of cancer due to abnormal vascularization in cancerous tissue. The growth of solid tumors requires an increase in blood supply to facilitate oxygen delivery to the tumor cells, and so tumors will stimulate the growth of new blood vessels, a process known as angiogenesis.⁵ However, the vascular network generated by this angiogenesis is irregular, disorganized, and fragile, leading to hypoxia and possible necrosis.⁵ Upregulation of CA9 is an adaptive response to this hypoxia that increases tumor survival rates, leading to poorer patient prognosis.²

Increased CA9 levels are correlated with tumor resistance to chemotherapy and radiotherapy and have been associated with poorer prognosis in prostate cancer, renal cell cancer, gastric cancer, breast cancer, and cervical cancer.^{2,3} CA9 has also been used to determine subtypes of renal epithelial neoplasms (RENs), which helps determine the correct course of treatment.¹

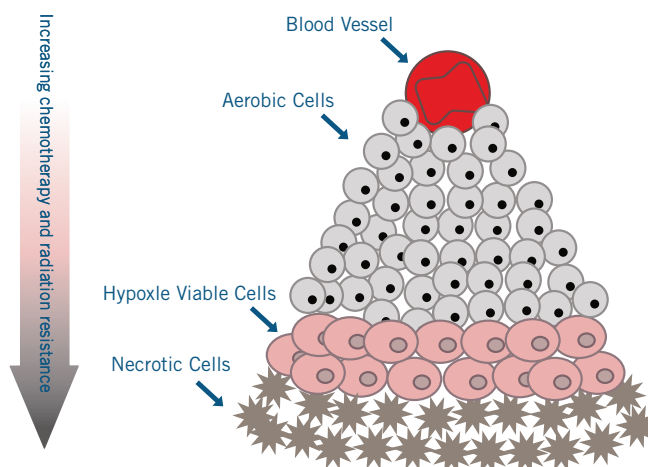
CA-9 stains and illustrations



Stomach cancer stained with CA-9 antibody



Gall bladder cancer stained with CA-9 antibody



To find out more about CA9, please visit our website at biocare.net or call 1-800-799-9499, option #3

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3. Gu M. CA9 overexpression is an independent favorable prognostic marker in intrahepatic cholangiocarcinoma. Int J Clin Exp Pathol. 2015 Jan 1;8(1):862-6.
4. Li, G., Bilal, I., Gentil-Perret, A., Feng, G., Zhao, A., Peoc'h, M., ... Gigante, M. (2012). CA9 as a molecular marker for differential diagnosis of cystic renal tumors. Urologic Oncology: Seminars and Original Investigations, 30(4), 463–468. doi:10.1016/j.urolonc.2010.04.014
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