

Meet the Marker: AMACR and P504S

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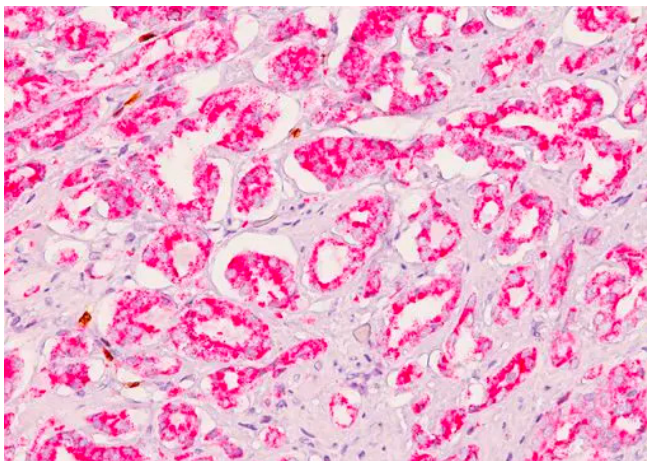
AMACR (alpha-methylacyl-CoA racemase) and P504S are two different names for the same biomarker used in the diagnosis and prognosis of prostate cancer, brought about due to technical naming conventions in the fields of biochemistry and pathology. When this enzyme was first discovered and characterized, it was given the name AMACR based on its role in the racemization of alpha-methylacyl-CoA substrates.⁵ Later, when it was identified as a diagnostic marker for prostate cancer, it was referred to as P504S based on its molecular weight (504kDa).^{2,3,5}

These two names are used interchangeably in literature but may be treated as distinct terms in order to differentiate between multiple formats of the same marker. For example, they may be used to distinguish two different clones for a marker of the same alpha-methylacyl-CoA racemase enzyme, or to denote polyclonal vs monoclonal format.⁴

AMACR/P504S is an enzyme that plays a role in the metabolism of fatty acids.² It is important for creating bile acids from cholesterol precursors.¹ Overexpression of AMACR/P504S has been implicated in prostatic adenocarcinoma and its precursors with a high degree of specificity, and so immunohistochemical detection of AMACR/P504S has become a standard assay for prostate cancer diagnosis.^{1,6}

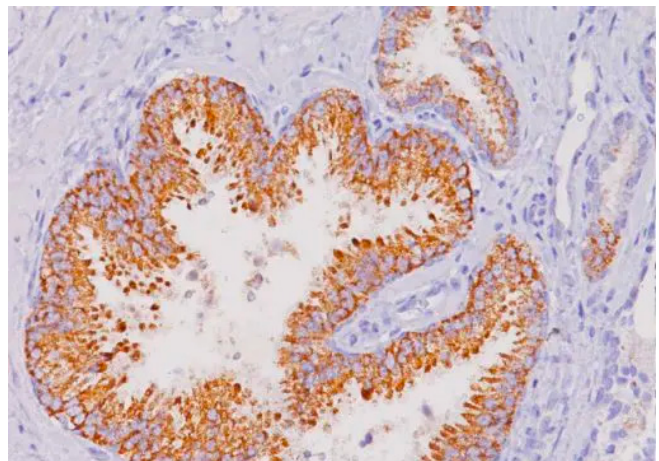
Additionally, this utility is not limited only to prostate cancer, as AMACR/P504S overexpression is also present in a variety of solid tumors.^{1,2} However, this feature may present as a double-edged sword, as it prevents this marker from being used to identify prostate cancer in biopsies containing metastatic adenocarcinoma of an unknown primary site.²

Biocare AMACR Rabbit Monoclonal Antibody



Prostate cancer stained with AMACR (P504S) antibody

Biocare P504S Polyclonal Antibody



Prostate cancer stained with P504S (P) antibody

To learn more about Biocare Medical's offerings for AMACR/P504S, please visit our website at biocare.net or call our Technical Support help line for more information at 1-800-799-9499, Option 3.

1. Brice A.P. Wilson, Haofan Wang, Benjamin A. Nacev, Ronnie C. Mease, Jun O. Liu, Martin G. Pomper, William B. Isaacs; High-Throughput Screen Identifies Novel Inhibitors of Cancer Biomarker α Methylacyl Coenzyme A Racemase (AMACR/P504S). *Mol Cancer Ther* 1 May 2011; 10 (5): 825–838. <https://doi.org/10.1158/1535-7163.MCT-10-0902> 2. Evans A. J. (2003). Alpha-methylacyl CoA racemase (P504S): overview and potential uses in diagnostic pathology as applied to prostate needle biopsies. *Journal of clinical pathology*, 56(12), 892–897. <https://doi.org/10.1136/jcp.56.12.892> 3. Jiang Z, Woda BA, Rock KL, et al. P504S: a new molecular marker for the detection of prostate carcinoma. *Am J Surg Pathol*. 2001;25(12):1397–1404. doi:10.1097/00000478-200112000-00003 4. Kunju, L. P., Chinnaiyan, A. M., & Shah, R. B. (2005). Comparison of monoclonal antibody (P504S) and polyclonal antibody to alpha methylacyl-CoA racemase (AMACR) in the work-up of prostate cancer. *Histopathology*, 47(6), 587–596. <https://doi.org/10.1111/j.1365-2559.2005.02281.5> 5. Rubin, M. A., Zhou, M., Dhanasekaran, S. M., Varambally, S., Barrette, T. R., Sanda, M. G., Pienta, K. J., Ghosh, D., & Chinnaiyan, A. M. (2002). alpha-Methylacyl coenzyme A racemase as a tissue biomarker for prostate cancer. *JAMA*, 287(13), 1662–1670. <https://doi.org/10.1001/jama.287.13.1662> 6. Rubin, M. A., Zhou, M., & Dhanasekaran, S. M. (2015). Alpha-methylacyl CoA racemase (P504S) as a target for immunohistochemistry in prostate cancer diagnosis. *Urologic Oncology: Seminars and Original Investigations*, 33(7), 305–307.