

**Supplementary Table S3.** Excluded potentially relevant studies

No	Study
1	Jiang Z, Fanger GR, Woda BA, et al. Expression of alpha-methylacyl-CoA racemase (P504s) in various malignant neoplasms and normal tissues: a study of 761 cases. <i>Hum Pathol</i> 2003; 34: 792-6. (No Control Group)
2	Kunju LP, Rubin MA, Chinnaiyan AM, Shah RB. Diagnostic usefulness of monoclonal antibody P504S in the workup of atypical prostatic glandular proliferations. <i>Am J Clin Pathol</i> 2003; 120: 737-45. (No Control Group)
3	Zhou M, Jiang Z, Epstein JI. Expression and diagnostic utility of alpha-methylacyl-CoA-racemase (P504S) in foamy gland and pseudohyperplastic prostate cancer. <i>Am J Surg Pathol</i> 2003; 27: 772-8. (No Control Group)
4	Leav I, McNeal JE, Ho SM, Jiang Z. Alpha-methylacyl-CoA racemase (P504S) expression in evolving carcinomas within benign prostatic hyperplasia and in cancers of the transition zone. <i>Hum Pathol</i> 2003; 34: 228-33. (No Control Group)
5	Suzue K, Montag AG, Tretiakova M, Yang XJ, Sahoo S. Altered expression of alpha-methylacyl-coenzyme A racemase in prostatic adenocarcinoma following hormone therapy. <i>Am J Clin Pathol</i> 2005; 123: 553-61. (No Control Group)
6	Rubin MA, Bismar TA, Andren O, et al. Decreased alpha-methylacyl CoA racemase expression in localized prostate cancer is associated with an increased rate of biochemical recurrence and cancer-specific death. <i>Cancer Epidemiol Biomarkers Prev</i> 2005; 14: 1424-32. (No Control Group)
7	Vanguri VK, Woda BA, Jiang Z. Sensitivity of P504S/alpha-methylacyl-CoA racemase (AMACR) immunohistochemistry for the detection of prostate carcinoma on stored needle biopsies. <i>Appl Immunohistochem Mol Morphol</i> 2006; 14: 365-8. (No Control Group)
8	Mehra R. Tissue microarray assessment of novel prostate cancer biomarkers AMACR and EZH2 and immunologic response to them in African-American and Caucasian men. 2006. Ann Arbor: The University of Michigan, 2006. (No Control Group)
9	Santinelli A, Mazzucchelli R, Barbisan F, et al. alpha-Methylacyl coenzyme A racemase, Ki-67, and topoisomerase IIalpha in cystoprostatectomies with incidental prostate cancer. <i>Am J Clin Pathol</i> 2007; 128: 657-66. (No Control Group)
10	Samaratunga H, Letizia B. Prostatic ductal adenocarcinoma presenting as a urethral polyp: a clinicopathological study of eight cases of a lesion with the potential to be misdiagnosed as a benign prostatic urethral polyp. <i>Pathology</i> 2007; 39: 476-81. (No Control Group)
11	Herawi M, Epstein JI. Immunohistochemical antibody cocktail staining (p63/HMWCK/AMACR) of ductal adenocarcinoma and Gleason pattern 4 cribriform and noncribriform acinar adenocarcinomas of the prostate. <i>Am J Surg Pathol</i> 2007; 31: 889-94. (No Control Group)
12	Mazzucchelli R, Barbisan F, Tagliabracci A, et al. Search for residual prostate cancer on pT0 radical prostatectomy after positive biopsy. <i>Virchows Arch</i> 2007; 450: 371-8. (No Control Group)
13	Maraldo D, Garcia FU, Mutharasan R. Method for quantification of a prostate cancer biomarker in urine without sample preparation. <i>Anal Chem</i> 2007; 79: 7683-90. (No Control Group)
14	Kristiansen G, Fritzsche FR, Wassermann K, et al. GOLPH2 protein expression as a novel tissue biomarker for prostate cancer: implications for tissue-based diagnostics. <i>Br J Cancer</i> 2008; 99: 939-48. (No Control Group)
15	Dalfior D, Delahunt B, Brunelli M, et al. Utility of racemase and other immunomarkers in the detection of adenocarcinoma in prostatic tissue damaged by high intensity focused ultrasound therapy. <i>Pathology</i> 2010; 42: 1-5. (No Control Group)
16	Kim HS, Moreira DM, Jayachandran J, et al. Prostate biopsies from black men express higher levels of aggressive disease biomarkers than prostate biopsies from white men. <i>Prostate Cancer Prostatic Dis</i> 2011; 14: 262-5. (No Control Group)
17	Boran C, Kandirali E, Yilmaz F, Serin E, Akyol M. Reliability of the 34betaE12, keratin 5/6, p63, bcl-2, and AMACR in the diagnosis of prostate carcinoma. <i>Urol Oncol</i> 2011; 29: 614-23. (No Control Group)
18	Barry M, Dhillon PK, Stampfer MJ, et al. alpha-Methylacyl-CoA racemase expression and lethal prostate cancer in the Physicians' Health Study and Health Professionals Follow-up Study. <i>Prostate</i> 2012; 72: 301-6. (No Control Group)

- 19 Garg M, Kaur G, Malhotra V, Garg R. Histopathological spectrum of 364 prostatic specimens including immunohistochemistry with special reference to grey zone lesions. *Prostate Int* 2013; 1: 146-51. (No Control Group)
- 20 Warrick JI, Humphrey PA. Foamy gland carcinoma of the prostate in needle biopsy: incidence, Gleason grade, and comparative alpha-methylacyl-CoA racemase vs. ERG expression. *Am J Surg Pathol* 2013; 37: 1709-14. (No Control Group)
- 21 Koca SB, Yildiz P, Behzatoglu K. Foamy gland carcinoma in core needle biopsies of the prostate: clinicopathologic and immunohistochemical study of 56 cases. *Ann Diagn Pathol* 2014; 18: 271-4. (No Control Group)
- 22 Andrews C, Humphrey PA. Utility of ERG versus AMACR expression in diagnosis of minimal adenocarcinoma of the prostate in needle biopsy tissue. *Am J Surg Pathol* 2014; 38: 1007-12. (No Control Group)
- 23 Zhang Y, Mao XY, Liu X, et al. High frequency of the SDK1:AMACR fusion transcript in Chinese prostate cancer. *Int J Clin Exp Med* 2015; 8: 15127-36. (No Control Group)
- 24 Box A, Alshalalfa M, Hegazy SA, Donnelly B, Bismar TA. High alpha-methylacyl-CoA racemase (AMACR) is associated with ERG expression and with adverse clinical outcome in patients with localized prostate cancer. *Tumour Biol* 2016; 37: 12287-99. (No Control Group)
- 25 Tariq H, Ahmed R, Muhammad I, et al. Immunohistochemical expression of alpha methylacyl-CoA racemase (AMACR) in carcinoma prostate in Pakistani population. *Pak Armed Forces Med J* 2017; 67: 1054-7. (No Control Group)
- 26 Cheng L, Montironi R, Davidson DD, Wang M, Lopez-Beltran A, Zhang S. Molecular evidence supporting the precursor nature of atypical adenomatous hyperplasia of the prostate. *Mol Carcinog* 2019; 58: 1272-8. (No Control Group)
- 27 Kotova ES, Savochkina YA, Doludin YV, et al. Identification of clinically significant prostate cancer by combined PCA3 and AMACR mRNA detection in urine samples. *Res Rep Urol* 2020; 12: 403-13. (No Control Group)
- 28 Huskova Z, Knillova J, Kolar Z, Vrbkova J, Kral M, Bouchal J. The percentage of free PSA and urinary markers distinguish prostate cancer from benign hyperplasia and contribute to a more accurate indication for prostate biopsy. *Biomedicines* 2020; 8: 173. (No Control Group)
- 29 Sanderson SO, Sebo TJ, Murphy LM, Neumann R, Slezak J, Cheville JC. An analysis of the p63/alpha-methylacyl coenzyme A racemase immunohistochemical cocktail stain in prostate needle biopsy specimens and tissue microarrays. *Am J Clin Pathol* 2004; 121: 220-5. (Inseparable Subject Matter)
- 30 Helpap B. The significance of the P504S expression pattern of high-grade prostatic intraepithelial neoplasia (HGPIN) with and without adenocarcinoma of the prostate in biopsy and radical prostatectomy specimens. *Virchows Arch* 2006; 448: 480-4.
- 31 Al-Maghrebi M, Kehinde EO, Anim JT, Sheikh M. The role of combined measurement of tissue mRNA levels of AMACR and survivin in the diagnosis and risk stratification of patients with suspected prostate cancer. *Int Urol Nephrol* 2012; 44: 1681-9. (Inseparable Subject Matter)
- 32 Kuroda N. Application of combined immunohistochemical panel of AMACR(P504S)/p63 cocktail, cytokeratin 5 and D2-40 to atypical glands in prostatic needle biopsy. *Malays J Pathol* 2014; 36: 169-73. (Inseparable Subject Matter)
- 33 Eryilmaz IE, Kordan Y, Vuruskan BA, Kaygisiz O, Tunca B, Cecener G. T2E (TMPRSS2-ERG) fusion transcripts are associated with higher levels of AMACR mRNA and a subsequent prostate cancer diagnosis in patients with atypical small acinar proliferation. *Gene* 2018; 645: 69-75. (Inseparable Subject Matter)
- 34 Jin X, Ji J, Niu D, et al. Urine exosomal AMACR is a novel biomarker for prostate cancer detection at initial biopsy. *Front Oncol* 2022; 12: 904315. (Inseparable Subject Matter)
- 35 Sreekumar A, Laxman B, Rhodes DR, et al. Humoral immune response to alpha-methylacyl-CoA racemase and prostate cancer. *J Natl Cancer Inst* 2004; 96: 834-43. (Insufficient Data)
- 36 Molin V, Fromont G, Sibony M, et al. Diagnostic utility of a p63/alpha-methyl-CoA-racemase (p504s) cocktail in atypical foci in the prostate. *Mod Pathol* 2004; 17: 1180-90. (Insufficient Data)
- 37 Molin V, Herve JM, Lugagne PM, Lebret T, Botto H. Diagnostic utility of a p63/alpha-methyl coenzyme A racemase (p504s) cocktail in ambiguous lesions of the prostate upon needle biopsy. *BJU Int* 2006; 97: 1109-15. (Insufficient Data)
- 38 Fujita K, Pavlovich CP, Netto GJ, et al. Specific detection of prostate cancer cells in urine by multiplex immunofluorescence cytology. *Hum Pathol* 2009; 40: 924-33. (Insufficient Data)

- 39 Prior C, Guillen-Grima F, Robles JE, et al. Use of a combination of biomarkers in serum and urine to improve detection of prostate cancer. *World J Urol* 2010; 28: 681-6. (Insufficient Data)
- 40 Scarpelli M, Mazzucchelli R, Barbisan F, et al. Is there a role for prostate tumour overexpressed-1 in the diagnosis of HGPIN and of prostatic adenocarcinoma? A comparison with alpha-methylacyl CoA racemase. *Int J Immunopathol Pharmacol* 2012; 25: 67-74. (Insufficient Data)
- 41 Ji J, Chen X, Xu Y, et al. Prostate cancer diagnosis using urine sediment analysis-based alpha-methylacyl-CoA racemase score: a single-center experience. *Cancer Control* 2019; 26: 1073274819887697. (Insufficient Data)
- 42 Garrido Castillo LN, Anract J, Delongchamps NB, et al. Polyploid giant cancer cells are frequently found in the urine of prostate cancer patients. *Cancers (Basel)* 2023; 15: 3366. (Insufficient Data)
- 43 Zha S, Ferdinandusse S, Denis S, et al. Alpha-methylacyl-CoA racemase as an androgen-independent growth modifier in prostate cancer. *Cancer Res* 2003; 63: 7365-76. (Irrelevant Subject Matter)
- 44 Liu AJ, Furusato B, Ravindranath L, et al. Quantitative analysis of a panel of gene expression in prostate cancer--with emphasis on NPY expression analysis. *J Zhejiang Univ Sci B* 2007; 8: 853-9. (Irrelevant Subject Matter)
- 45 FitzGerald LM, Thomson R, Polanowski A, et al. Sequence variants of alpha-methylacyl-CoA racemase are associated with prostate cancer risk: a replication study in an ethnically homogeneous population. *Prostate* 2008; 68: 1373-9. (Irrelevant Subject Matter)
- 46 Harvey AM, Grice B, Hamilton C, et al. Diagnostic utility of P504S/p63 cocktail, prostate-specific antigen, and prostatic acid phosphatase in verifying prostatic carcinoma involvement in seminal vesicles: a study of 57 cases of radical prostatectomy specimens of pathologic stage pT3b. *Arch Pathol Lab Med* 2010; 134: 983-8. (Irrelevant Subject Matter)
- 47 Jamaspishvili T, Kral M, Khomeriki I, et al. Quadriplex model enhances urine-based detection of prostate cancer. *Prostate Cancer Prostatic Dis* 2011; 14: 354-60. (Irrelevant Subject Matter)
- 48 Paziewska A, Dabrowska M, Goryca K, et al. DNA methylation status is more reliable than gene expression at detecting cancer in prostate biopsy. *Br J Cancer* 2014; 111: 781-9. (Irrelevant Subject Matter)
- 49 Mahdian R, Nodouzi V, Asgari M, et al. Expression profile of MAGI2 gene as a novel biomarker in combination with major deregulated genes in prostate cancer. *Mol Biol Rep* 2014; 41: 6125-31. (Irrelevant Subject Matter)
- 50 Goldstein J, Borowsky AD, Goyal R, et al. MAGI-2 in prostate cancer: an immunohistochemical study. *Hum Pathol* 2016; 52: 83-91. (Irrelevant Subject Matter)
- 51 Abdellaoui Maane I, El Hadi H, Qmichou Z, et al. Evaluation of combined quantification of PCA3 and AMACR Gene Expression for Molecular Diagnosis of Prostate Cancer in Moroccan Patients by RT-qPCR. *Asian Pac J Cancer Prev* 2016; 17: 5229-35. (Irrelevant Subject Matter)
- 52 Alinezhad S, Vaananen RM, Tallgren T, et al. Stratification of aggressive prostate cancer from indolent disease-Prospective controlled trial utilizing expression of 11 genes in apparently benign tissue. *Urol Oncol* 2016; 34: 255. (Irrelevant Subject Matter)
- 53 Bachurska SY, Staykov DG, Bakardzhiev IV, Antonov PA, Belovezhkov VT. Diagnostic value of ERG in prostate needle biopsies containing minute cancer foci. *Folia Med (Plovdiv)* 2017; 59: 84-90. (Irrelevant Subject Matter)
- 54 Koseoglu E, Tuncel A, Balci M, et al. Netrin 1 and Alpha-Methyl Acylcoenzim-A racemase in diagnosis of prostate cancer. *Colomb Med (Cali)* 2018; 49: 164-8. (Irrelevant Subject Matter)
- 55 Fu P, Bu C, Cui B, Li N, Wu J. Screening of differentially expressed genes and identification of AMACR as a prognostic marker in prostate cancer. *Andrologia* 2021; 53: e14067. (Irrelevant Subject Matter)
- 56 Stephen N, Badhe BA. Diagnostic utility of immunohistochemical markers alpha methyl acyl coA racemase (AMACR) and Ets related gene (ERG) in prostate cancer. *Int J Clin Exp Pathol* 2022; 15: 364-72. (Irrelevant Subject Matter)