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# Meta-Analysis of Genetic Variants in Alcohol Metabolizing Enzymes and their Association with Colorectal Cancer Risk

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Chapter | [First Online: 05 March 2020](#)

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Part of the [Diagnostics and Therapeutic Advances in GI Malignancies](#) book series (DTAGIM)

## Abstract

Several prospective cohort and case-control studies have provided strong evidence describing an association between alcohol consumption and risk of colorectal cancer (CRC). Studies on the association of ADH1B Arg47His and ALDH2 Glu487Lys variants with CRC risk were inconclusive. In this chapter we aimed to elucidate the genetic associations of the alcohol metabolic enzymes with CRC risk. An organized literature search was performed in PubMed, Embase and Google scholar

bibliographic databases to retrieve various case-control studies associated with alcohol metabolism genes and CRC. A meta-analysis was performed based on the random-effect model to calculate the overall association of ADH1B Arg47His and ALDH2 Glu487Lys variants with CRC risk. No association was found between ADH1B and ALDH2 gene polymorphisms and susceptibility of CRC. Stratified analysis by ethnicity also did not reveal a significant association between these variants and CRC risk. Cochran Q-test and  $I^2$  statistics revealed heterogeneity in association with these variants ( $P < 0.001$ ). Publication bias tests did not reveal evidence for bias. Thus, ADH1B Arg47His and ALDH2 Glu487Lys genetic variants are not considered as risk factors for CRC.

## Keywords

**Colorectal cancer**      **Meta-analysis**

**Alcohol metabolism**      **ADH1B**      **ALDH2**

**Polymorphism**      **Susceptibility**

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## Abbreviations

**ADH:** alcohol dehydrogenase

**ALDH:** aldehyde dehydrogenase

**Arg:** Arginine

**CI:** Confidence intervals

**CRC:** Colorectal cancer

**FEM:** Fixed effects model

**Glu:** Glutamic acid

**His:** Histidine

**HWE:** Hardy-Weinberg equilibrium

**Lys:** Lysine

**NAD:** Nicotinamide adenine dinucleotide

**OR:** Odds ratio

**PRISMA:** Preferred reporting items for systematic reviews and meta-analyses

**REM:** Random effects model

**Tyr:** Tyrosine

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## Conflict of Interest

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There are no conflicts of interests.

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Cite this chapter

Bhaskar, L.V.K.S., Sharma, S., Merchant, N., Pattnaik, S. (2020). Meta-Analysis of Genetic Variants in Alcohol Metabolizing Enzymes and their Association with Colorectal Cancer Risk. In: Raju, G., Bhaskar, L. (eds) Theranostics Approaches to Gastric and Colon Cancer. Diagnostics and Therapeutic Advances in GI Malignancies. Springer, Singapore. [https://doi.org/10.1007/978-981-15-2017-4\\_10](https://doi.org/10.1007/978-981-15-2017-4_10)

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DOI

[https://doi.org/10.1007/978-981-15-2017-4\\_10](https://doi.org/10.1007/978-981-15-2017-4_10)

Published	Publisher Name	Print ISBN
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