Meet the Marker: HLA-DR

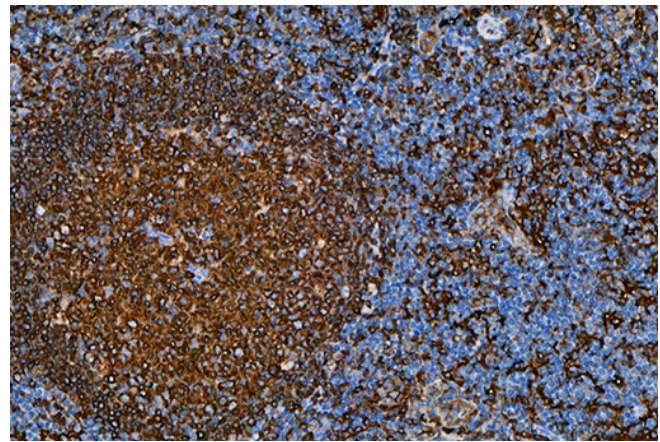**BIO**CARE
M E D I C A L

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Gastrointestinal cancers are among the most common and serious types of cancer worldwide. Gastric adenocarcinoma is one of the most common diseases the world over.[1] Colorectal cancer (CRC) is in the top three most common types of cancer and is the third leading cause of cancer mortality.[2] Esophageal adenocarcinoma (EAC) tends to be aggressive with a generally poor prognosis, and rates of EAC have been increasing worldwide.[4] Given the incidence and severity of such cancers, there is a need for markers to predict prognostic outcomes, and research has found that the marker HLA-DR can serve as both a positive and negative prognostic indicator for different types of gastrointestinal cancers, particularly CRC.[4]

HLA-DR (Human Leukocyte Antigen – DR isotype) is a major histocompatibility complex (MHC) class II antigen, critical for immune system activation and the coordination of adaptive immune responses.[3] It is normally expressed on antigen-presenting cells, including monocytes, macrophages, dendritic cells, and B cells, but expression can be induced on epithelial cells and tumor cells in response to inflammatory conditions.[1,2]

HLA-DR expression has been associated with a positive prognosis in colorectal cancer, gastric cancer, esophageal adenocarcinoma, and squamous cell carcinoma of the larynx.[4] However, it is associated with a negative prognosis in other cancer types, such as glioma and esophageal squamous cell carcinoma.[4] The exact reason behind this contrasting positive and negative prognostic function is the subject of ongoing research.

While the exact mechanism behind HLA-DR's prognostic potential is still not fully understood, HLA-DR's role in immune system responses seems to be key since immune recognition of tumors and the subsequent infiltration of tumors by immune cells is known to contribute to better survivability.[2,5] For example, research has found that the HLA-DR antigen is necessary for the recognition of tumors by CD4+ T cells.[2,6]
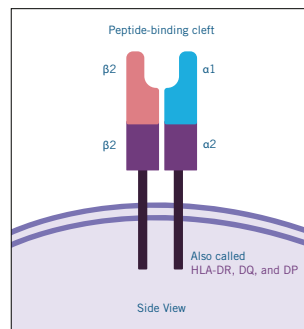
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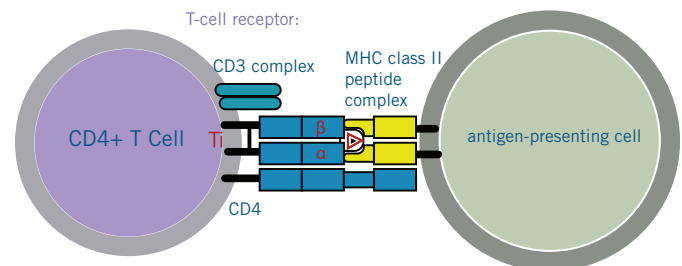

Tonsil stained with HLA-DR [TAL 1B5] antibody

MHC Class I
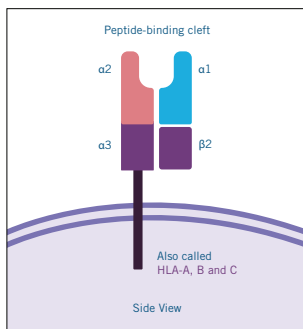
CD8 binds the α3 domain of MHC class I

CD4 binds the β3 domain of MHC class II

To learn more about Biocare Medical's HLA-DR antibody, please call 1-800-799-9499, option #3, or visit our website at biocare.net

1. Bilici, M., Okcu, N., Cayır, K., Pirim, I., Tekin, S. B., & Gundogdu, C. (2010). Distribution of HLA Tissue Groups in Patients with Gastric Cancer. The Eurasian journal of medicine, 42(1), 9–11. https://doi.org/10.5152/eajm.2010.03

2. Diederichsen, A. C. P., v. B. Hjelmborg, J., Christensen, P. B., Zeuthen, J., & Fenger, C. (2003). Prognostic value of the CD4+/CD8+ ratio of tumour infiltrating lymphocytes in colorectal cancer and HLA-DR expression on tumour cells. Cancer Immunology, Immunotherapy, 52(7), 423–428. doi:10.1007/s00262-003-0388-5

3. Dunne MR, Phelan JJ, Michielsen AJ, et al. Characterising the prognostic potential of HLA-DR during colorectal cancer development. Cancer Immunol Immunother. 2020;69(8):1577-1588.

4. Dunne, M. R., Michielsen, A. J., O'Sullivan, K. E., Cathcart, M. C., Feighery, R., Doyle, B., Watson, J. A., O'Farrell, N. J., Ravi, N., Kay, E., Reynolds, J. V., Ryan, E. J., & O'Sullivan, J. (2017). HLA-DR expression in tumor epithelium is an independent prognostic indicator in esophageal adenocarcinoma patients. Cancer immunology, immunotherapy : CII, 66(7), 841–850. https://doi.org/10.1007/s00262-017-1983-1

5. Ishigami, S., Aikou, T., Natsugoe, S., Hokita, S., Iwashige, H., Tokushige, M., & Sonoda, S. (1997). Prognostic Value of HLA-DR Expression and Dendritic Cell Infiltration in Gastric Cancer. Oncology, 55(1), 65–69. doi:10.1159/000011837

6. Matsushita, K., Takenouchi, T., Shimada, H., Tomonaga, T., Hayashi, H., Shioya, A., … Ochiai, T. (2006). Strong HLA-DR antigen expression on cancer cells relates to better prognosis of colorectal cancer patients: Possible involvement of c-myc suppression by interferon-gammain situ. Cancer Science, 97(1), 57–63. doi:10.1111/j.1349-7006.2006.00137.x