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EDITORIAL

Wu YX, Tian R, Li XW, Guo JY, Tang JF, Zhou CF. Emerging non-invasive imaging biomarkers of Ki-67 in pancreatic cancer: Toward predictive precision oncology. *World J Gastrointest Oncol* 2025; 17(11): 110468 [DOI: 10.4251/wjgo.v17.i11.110468]

REVIEW

Elsayed MOK. Treatment of recurrent hepatocellular carcinoma: The current standards and future perspectives. *World J Gastrointest Oncol* 2025; 17(11): 110735 [DOI: 10.4251/wjgo.v17.i11.110735]

MINIREVIEWS

Nian H, Bai Y, Wang HY, Yu H, Zhang ZL, Shi RH, Zhang S, Wu YB, Zhou DH, Du QC. Targeting the Osteopontin-regulated PI3K/AKT signaling pathway: A molecular approach to overcome drug resistance and metastasis in gastrointestinal tumors. *World J Gastrointest Oncol* 2025; 17(11): 109923 [DOI: 10.4251/wjgo.v17.i11.109923]

Paramythiotis D, Tsavdaris D, Geropoulos G, Sacchet DA, Psarras K. Management of peritoneal metastases from colorectal cancer and small bowel adenocarcinoma in patients with inflammatory bowel disease. *World J Gastrointest Oncol* 2025; 17(11): 110486 [DOI: 10.4251/wjgo.v17.i11.110486]

Li X, Jiao Y, Liu YH. Precision medicine advances in pancreatic cancer driven by genomic and molecular alterations. *World J Gastrointest Oncol* 2025; 17(11): 111264 [DOI: 10.4251/wjgo.v17.i11.111264]

Xu YH, Jiao Y. Reassessing the role of lymph node dissection in pancreatic cancer surgery: Balancing oncologic control and immune function preservation. *World J Gastrointest Oncol* 2025; 17(11): 112248 [DOI: 10.4251/wjgo.v17.i11.112248]

ORIGINAL ARTICLE**Case Control Study**

Pelisenca IA, Trandafir B, Dobre AM, Dragne AD, Herlea V, Niculae AM, Vasilescu C, Hinescu ME, Milanesi E, Dobre M. MicroRNAs in colorectal cancer: A comparative analysis of circulating and tissue microRNA levels. *World J Gastrointest Oncol* 2025; 17(11): 110266 [DOI: 10.4251/wjgo.v17.i11.110266]

Retrospective Cohort Study

Huang ZZ, Žmudka K, Ruggiano V, Hsu WL, Liu J, Chiang CJ, Chen YC, Wang V. Secular trend in universal hepatocellular carcinoma prevention: Taiwan, Poland, and Belgium experience. *World J Gastrointest Oncol* 2025; 17(11): 110840 [DOI: 10.4251/wjgo.v17.i11.110840]

Jabbar SAA, Choo ALE, Wong NW, Ngu JCY, Teo NZ. Comparing early surgical outcomes between total neoadjuvant therapy and standard long course chemoradiotherapy for rectal cancer. *World J Gastrointest Oncol* 2025; 17(11): 111250 [DOI: 10.4251/wjgo.v17.i11.111250]

Retrospective Study

Wang Z, Cheng JW, Yu KY. Short-term and long-term effects of sevoflurane inhalation vs propofol total intravenous anesthesia in gastrectomy for gastric cancer. *World J Gastrointest Oncol* 2025; 17(11): 109375 [DOI: [10.4251/wjgo.v17.i11.109375](https://doi.org/10.4251/wjgo.v17.i11.109375)]

Xie MJ, Li JJ, Guo YJ, Wang Q, Tan ZB, Li YL, Li JP. Construction of a prognostic model for colorectal cancer liver metastasis: A retrospective study based on population data. *World J Gastrointest Oncol* 2025; 17(11): 110675 [DOI: [10.4251/wjgo.v17.i11.110675](https://doi.org/10.4251/wjgo.v17.i11.110675)]

Yang HY, Chong JU, Jang M, Lee SH, Hwang HK, Lee WJ, Kang CM. Stromal secreted protein acidic and rich in cysteine expression: A potential target for improved prognosis in patients with pancreatic cancer. *World J Gastrointest Oncol* 2025; 17(11): 110704 [DOI: [10.4251/wjgo.v17.i11.110704](https://doi.org/10.4251/wjgo.v17.i11.110704)]

Jin T, Zhou YW, Sun PS, Huang Y, Gao JG, Jin X. Unraveling the characteristics of early esophageal neuroendocrine carcinoma using multi-model endoscopy: A retrospective study of serial cases. *World J Gastrointest Oncol* 2025; 17(11): 110715 [DOI: [10.4251/wjgo.v17.i11.110715](https://doi.org/10.4251/wjgo.v17.i11.110715)]

Li SJ, Lu YX, Zheng FY, Bian YC, Miao LY, Huang CR. Tumour chemotherapy sensitivity test may predict clinical outcomes in colorectal cancer patients receiving oxaliplatin and fluoropyrimidine-based regimens. *World J Gastrointest Oncol* 2025; 17(11): 111171 [DOI: [10.4251/wjgo.v17.i11.111171](https://doi.org/10.4251/wjgo.v17.i11.111171)]

Yu JH, Yu J, Yu JX, Yang LF, Yan D, Liu Y, Xian JR, Yi PS. Personalized prognosis in unresectable hepatocellular carcinoma: Development and validation of a model for transcatheter arterial chemoembolization plus lenvatinib. *World J Gastrointest Oncol* 2025; 17(11): 111814 [DOI: [10.4251/wjgo.v17.i11.111814](https://doi.org/10.4251/wjgo.v17.i11.111814)]

Yang CX, Xu LX, Liu J, Qiao HL, Dong ZW, Jiang D, Gu GL. Clinicopathological characteristics and surgical value of primary gastrointestinal lymphoma. *World J Gastrointest Oncol* 2025; 17(11): 112089 [DOI: [10.4251/wjgo.v17.i11.112089](https://doi.org/10.4251/wjgo.v17.i11.112089)]

Yao ZY, Bao G, Li GC, Hao QL, Ma LJ, Rao YX, Xu K, Ma X, Han ZX. Survival prognosis in advanced HER-2 negative gastric cancer treated with immunochemotherapy: A novel model. *World J Gastrointest Oncol* 2025; 17(11): 112981 [DOI: [10.4251/wjgo.v17.i11.112981](https://doi.org/10.4251/wjgo.v17.i11.112981)]

Zhang ZY, Zhou M, Liu JJ, Zhang W. Folate receptor-positive circulating tumor cells might function as potential biomarkers for hepatocellular carcinoma. *World J Gastrointest Oncol* 2025; 17(11): 113431 [DOI: [10.4251/wjgo.v17.i11.113431](https://doi.org/10.4251/wjgo.v17.i11.113431)]

Observational Study

Xu BG, Zhang X, Liu F, Li FH, Zhang X, Xiang HL, Liang J. Effect of antiviral therapy on 3-year recurrence and prognosis of hepatocellular carcinoma after curative radiofrequency ablation. *World J Gastrointest Oncol* 2025; 17(11): 112689 [DOI: [10.4251/wjgo.v17.i11.112689](https://doi.org/10.4251/wjgo.v17.i11.112689)]

Basic Study

Mao HQ, Yu FC, Hu DQ, Zhang LJ. Myc-associated zinc finger protein drives colorectal cancer metastasis through activating ubiquitin like with ring finger protein one. *World J Gastrointest Oncol* 2025; 17(11): 109481 [DOI: [10.4251/wjgo.v17.i11.109481](https://doi.org/10.4251/wjgo.v17.i11.109481)]

Yuan J, Gu WC, Xu TX, Shen XJ, Li X, Shen L, Zhang Y, Ju SQ. 5'-transfer RNA halve-lysine-CTT as a promising biomarker for early detection of hepatocellular carcinoma. *World J Gastrointest Oncol* 2025; 17(11): 111142 [DOI: [10.4251/wjgo.v17.i11.111142](https://doi.org/10.4251/wjgo.v17.i11.111142)]

Liu SC, Zhang H. Early cancer diagnosis via interpretable two-layer machine learning of plasma extracellular vesicle long RNA. *World J Gastrointest Oncol* 2025; 17(11): 111670 [DOI: [10.4251/wjgo.v17.i11.111670](https://doi.org/10.4251/wjgo.v17.i11.111670)]

Tur R, Abad M, Filipovich E, Rivas MB, Rodriguez M, Montero JC, Sayagués JM. *RSPO3* rearrangements in advanced colorectal cancer patients and their relationship with disease characteristics. *World J Gastrointest Oncol* 2025; 17(11): 112838 [DOI: [10.4251/wjgo.v17.i11.112838](https://doi.org/10.4251/wjgo.v17.i11.112838)]

META-ANALYSIS

Yan WX, Yuan HQ, Xiong ZY, Qin LJ, Wu J, He J, Mu J, Li J, Li N. Meta-analysis of the efficacy of neoadjuvant immunotherapy combined with radiotherapy and chemotherapy for locally advanced rectal cancer. *World J Gastrointest Oncol* 2025; 17(11): 113048 [DOI: [10.4251/wjgo.v17.i11.113048](https://doi.org/10.4251/wjgo.v17.i11.113048)]

CASE REPORT

Yang SH, Ren HF, Chen X, Wang R, Zhang MG. Refractory esophageal stenosis after endoscopic submucosal dissection for esophageal cancer managed with multiple dilations: A case report. *World J Gastrointest Oncol* 2025; 17(11): 110828 [DOI: [10.4251/wjgo.v17.i11.110828](https://doi.org/10.4251/wjgo.v17.i11.110828)]

Wang QY, Xia WH, Wan W, Liu JP. Pancreatic cancer initially presenting with acute renal infarction: A case report. *World J Gastrointest Oncol* 2025; 17(11): 112203 [DOI: [10.4251/wjgo.v17.i11.112203](https://doi.org/10.4251/wjgo.v17.i11.112203)]

Yang XM, Sun W, He YG, Peng XH, You N, Tang YC, Zheng L, Huang XB. Patient-derived organoids for the personalized treatment of pancreatic neuroendocrine tumor with liver metastases: A case report. *World J Gastrointest Oncol* 2025; 17(11): 112385 [DOI: [10.4251/wjgo.v17.i11.112385](https://doi.org/10.4251/wjgo.v17.i11.112385)]

Hong YY, Shou CH, Yang WL, Wang XD, Zhang Q, Liu XS, Yu JR. *FGFR2* fusions as novel oncogenic drivers in gastrointestinal stromal tumors: Two case reports and review of literature. *World J Gastrointest Oncol* 2025; 17(11): 113262 [DOI: [10.4251/wjgo.v17.i11.113262](https://doi.org/10.4251/wjgo.v17.i11.113262)]

LETTER TO THE EDITOR

Zhao CF, Li QW, Ye SY, Chen LW, Xu ZF. Innovative insights and future research directions in gastric cancer through single-cell RNA sequencing. *World J Gastrointest Oncol* 2025; 17(11): 103808 [DOI: [10.4251/wjgo.v17.i11.103808](https://doi.org/10.4251/wjgo.v17.i11.103808)]

Kumar S. Artificial intelligence powered radiomics model for the assessment of colorectal tumor immune microenvironment. *World J Gastrointest Oncol* 2025; 17(11): 108576 [DOI: [10.4251/wjgo.v17.i11.108576](https://doi.org/10.4251/wjgo.v17.i11.108576)]

Demirli Atici S. Innovative insights into gut microbiota modulation in colorectal cancer: From microbial dysbiosis to therapeutic strategies. *World J Gastrointest Oncol* 2025; 17(11): 108747 [DOI: [10.4251/wjgo.v17.i11.108747](https://doi.org/10.4251/wjgo.v17.i11.108747)]

Jagtap SV, Jagtap SS. Evaluation of pancreatic adenocarcinoma with tumor budding and lymphocytic infiltration as prognostic marker. *World J Gastrointest Oncol* 2025; 17(11): 110798 [DOI: [10.4251/wjgo.v17.i11.110798](https://doi.org/10.4251/wjgo.v17.i11.110798)]

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The primary aim of *World Journal of Gastrointestinal Oncology* (*WJGO*, *World J Gastrointest Oncol*) is to provide scholars and readers from various fields of gastrointestinal oncology with a platform to publish high-quality basic and clinical research articles and communicate their research findings online.

WJGO mainly publishes articles reporting research results and findings obtained in the field of gastrointestinal oncology and covering a wide range of topics including liver cell adenoma, gastric neoplasms, appendiceal neoplasms, biliary tract neoplasms, hepatocellular carcinoma, pancreatic carcinoma, cecal neoplasms, colonic neoplasms, colorectal neoplasms, duodenal neoplasms, esophageal neoplasms, gallbladder neoplasms, *etc.*

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Artificial intelligence powered radiomics model for the assessment of colorectal tumor immune microenvironment

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Abstract

Zhou *et al*'s investigation on the creation of a non-invasive deep learning (DL) method for colorectal tumor immune microenvironment evaluation using preoperative computed tomography (CT) radiomics published in the *World Journal of Gastrointestinal Oncology* is thorough and scientific. The study analyzed preoperative CT images of 315 confirmed colorectal cancer patients, using manual regions of interest to extract DL features. The study developed a DL model using CT images and histopathological images to predict immune-related indicators in colorectal cancer patients. Pathological (tumor-stroma ratio, tumor-infiltrating lymphocytes infiltration, immunohistochemistry, tumor immune microenvironment and immune score) parameters and radiomics (CT imaging and model construction) data were combined to generate artificial intelligence-powered models. Clinical benefit and goodness of fit of the models were assessed using receiver operating characteristic, area under curve and decision curve analysis. The developed DL-based radiomics prediction model for non-invasive evaluation of tumor markers demonstrated potential for personalized treatment planning and immunotherapy strategies in colorectal cancer patients. The study, involving a small group from a single medical center, lacks inclusion/exclusion criteria and should include clinicopathological features for valuable therapeutic practice insights in colorectal cancer patients.

Key Words: Colorectal cancer; Machine learning model; Immune markers; Tumor microenvironment; Preoperative therapy decision; Cancer

Core Tip: The present hospital-based retrospective research designed an artificial intelligence- and pathological data-based predictive model to make preoperative immunotherapy decisions in colorectal cancer patients. The study includes a small number of individuals from a single medical center. Study claims deep learning radiomics models based on tumor immune microenvironment assessment for personalized immunotherapy decisions in colorectal cancer patients. The study lacks inclusion and exclusion criteria, particularly the exclusion of patients having other malignancies and prior treatment/immunotherapy status. The analysis should look at the clinicopathological features (age, sex, how well the tumor is differentiated, stage, lymph node status, lymphovascular invasion, and perineural invasion) of patients in both the training and validation groups. These metrics will yield valuable insights for therapeutic practice.

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TO THE EDITOR

I am delighted to read the high-quality article by Zhou *et al*[1], published in the *World Journal of Gastrointestinal Oncology*. In this study, from January 2021 to September 2023, 315 colorectal cancer (CRC) patients were randomly assigned to training (220) or validation (95) cohorts in a ratio of 7:3. Training and validation groups have similar clinical characteristics, according to statistical analysis. This study integrates computed tomography (CT) imaging and pathology data from CRC patients using deep learning (DL) to construct and verify an immune microenvironment prognostic model. First, pathologists identified the tumor's highest infiltration region using a blinded approach. Sections were stained, and the tumor-stroma ratio (TSR) was calculated and classified as high TSR (> 50%) and low TSR (\leq 50%). Next, tumor-infiltrating lymphocyte infiltrations (TILs) were graded (0-3) based on tumor infiltration in pathological sections: No lymphocyte reaction, dispersed lymphocytes, moderate lymphocyte reactivity, and considerable infiltration disturbing tumor cell integrity. Low (grade 0-1) and high (grade 2-3) TILs were assigned to the cases. Immunohistochemistry identified cluster of differentiation (CD) 3(+) and CD8(+) T lymphocytes in the tissue using EnVision-stained paraffin sections. Images were used to measure immune cell count (IS) in patients, with high IS (> 2) and low IS (\leq 2) being considered high and low, respectively. Elevated TSR, TILs, and IS levels, patients were assigned a score, indicating low tumor immune microenvironment (TIME) (0 or 1), while scores of 2 or 3 indicated high TIME (1-3). Radiomics work included defining CRC patients' regions of interest (ROIs) before surgery using CT scanning. Radiologists used ITK-SNAP software to delineate ROIs, and the crop tool extracted the largest ROI cross-section. PyRadiomics extracted radiomic characteristics from ROIs without notable difference. The ImageNet dataset was used to pre-train several models (ResNet-34/50/101/152, DenseNet-121/169/201). Visualizing and analyzing the model using Gradient Weighted Class Activation Mapping improved transparency and knowledge of its decision-making process. The models' prediction accuracy was examined using receiver operator characteristic curves, area under the curve values, calibration curves, and decision curve analysis (DCA). The DenseNet-169 and DenseNet-121 models were chosen as the expected TSR DL and TILs prediction models, respectively, based on the area under the curve values for the training and validation sets. Similarly, DenseNet-121 and DenseNet-169 were identified as the best models for predicting high and low IS and TIME scores, respectively. DCA curves showed that the models had positive clinical utility and robust correlations, indicating an accurate labelling prediction. The violin plot revealed important differences in probability distributions among the four models, showing that the predictive model can effectively identify and detect changes in the immune microenvironment in CT data.

CRC, the third most diagnosed cancer globally, saw 2 million new cases in 2020, with 10% of patients under 50. By 2040, 3.2 million new cases and 1.6 million deaths are predicted, with 80% occurring in high or very high human development index countries[2,3]. Metabolic syndrome, characterized by hyperglycaemia, dyslipidaemia, abdominal obesity, and hypertension, is linked to increased CRC risk (25%) and mortality, with inconsistent results[4]. Tobacco use is associated with an increased incidence of CRC, while alcohol consumption-particularly ethanol intake of 50 g or more *per day*-is linked to both a higher risk and greater mortality[5,6]. CRC may originate from hereditary disorders. Lynch syndrome, a genetic disorder characterized by a DNA mismatch repair deficit, results in the loss of certain genes, indicating microsatellite instability in CRC[7]. Hereditary nonpolyposis CRC is another genetic illness caused by a mutation in a DNA mismatch repair system, affecting 2% to 3% of all colorectal malignancies and affecting approximately 1 in 500 people[8]. An international study identifies four consensus molecular subtypes (1-4) for prognostic classification of primary tumors, based on microenvironment, metabolic signatures, genomic, epigenomic, and molecular aberrations [9]. The immune score, an immune-based assay, quantifies CD3 and CD8-positive T cells in the tumor microenvironment, inversely linked with the disease recurrence. However, its use in clinical settings is limited. Pathogenic risk factors for recurrence or distant metastasis in advanced colon and rectal cancer include T4 tumors, N2 disease, inadequate lymph node dissection, invasion, tumor deposits, poorly differentiated histology, or a combination[10,11].

Tumor transformation is complicated and compromises normal cell-tissue balance. Cancer research has shifted its emphasis to the tumor microenvironment, a dynamic and diverse assemblage of immune and other cells together with extracellular matrix constituents. The tumor microenvironment is essential for antitumor immunity and a potential tumor

immunotherapy target[12-14]. Radiomics, a new analysis tool, can extract high-throughput quantitative data from medical images to explain tumor characteristics and heterogeneity. This information aids clinical practice, tumor grade prediction, and therapy selection[15,16]. This report assesses the utility of a radiomic imaging-based model combined with the TIME feature assessment for the pre-operative clinical personalized immunotherapy decisions in CRC patients. They reported that CT-based DL radiomics from preoperative TIME allow personalized immunotherapy methods in CRC management. Although their data is intriguing, I have some issues with the paper. The study lacks inclusion and exclusion criteria. I suggest some of the important inclusion criteria, such as histologically confirmed CRC samples, preoperative CT scan availability, and TIME data availability, especially with immunohistochemistry profiling of CD3(+) and CD8(+) T lymphocytes. The study should exclude participants with prior neoadjuvant therapy or those who are older (or the specific age group should be mentioned), as per the study design. Aging leads to immunosenescence, affecting TIME composition. Including older patients may introduce age-related immune changes, potentially affecting tumor-specific responses[17]. Similarly, exclusion criteria may include exclusion of poor-quality or incomplete CT imaging, patients with a history of other malignancies within the past five years, incomplete clinical or pathological data, prior treatment affecting the immune profile, *etc.* Generally, this five-year timeframe in the exclusion criteria is used due to key considerations such as risk of recurrence, treatment interference, potential for confounding comorbidities, and five-year standard window in many oncology clinical trial protocols. Cancers have a higher risk of recurrence within the first five years after treatment, so including patients with a recent history of other malignancies could confound the results of a study. Patients with residual effects from previous treatments could interact with the study intervention, making it difficult to assess its impact. The five-year window is a standard in oncology clinical trial protocols to minimize confounding factors[18].

Immunotherapy affects the tumor's immune milieu; thereby, enrolling those individuals might bias TIME results, especially when studying tumor immune context or baseline prognostic markers. The study makes no mention of the immunotherapy status of the enrolled patients. CD8(+) T cells are key cytotoxic effectors, directly killing tumor cells, while CD4(+) T cells support and regulate immune responses, with high infiltration indicating better prognosis and immune checkpoint response. Focusing solely on CD8(+) and CD4(+) T cells is limited, as regulatory T-cells suppress anti-tumor immune responses, potentially causing negative prognoses in some cancers but complex in CRC[19]. Furthermore, tumor-associated macrophages, with M1-type being pro-inflammatory and tumor-suppressing and M2-type being immunosuppressive and tumor-promoting, often dominate CRC and are linked to worse outcomes[20]. Moreover, recent research reveals that B cells and tertiary lymphoid structures boost anti-tumor immunity, especially in CRC tumors with high microsatellite instability[21]. In addition, neutrophils and SOX2 proteins are some other examples which have been used as tumor infiltration markers for imaging-based studies in tumor patients[22]. Even though CD4(+) and CD8(+) T cells are important indicators, studying the TIME in CRC through innate immune cells and suppressive groups gives better predictions for outcomes and treatment responses.

Clinicopathological features of training and validation cohort patients are missing from the investigation. The author should include baseline features such as age, sex, tumor differentiation (high, middle, and low), stage, lymph node status, lymphovascular and perineural invasion, *etc.* These baseline features help in the correlation of study outcome data with a broader perception. Cui *et al*[23] used preoperative CT scans to forecast TSR status and overall survival in a large group of CRC patients from multiple centers by using a multitask DL model. They also tested the approach for predicting the benefit of adjuvant chemotherapy. The study included 2268 individuals, 81% of whom had stage II or III CRC. The multitask DL model developed by Cui *et al*[23] effectively predicted overall and disease-free survival in CRC patients, with high multitask DL scores benefiting from adjuvant chemotherapy for stage II and III disease, despite clinicopathological variables. Thus, the study indicates the model is more authentic for stage II or III CRC patients, based on which the prospective study may be designed. The prospective study needs to be tested on a new set of patients to ensure its generalizability. The study could evaluate the model's impact on real-world clinical decision-making, compare it to standard risk assessment tools, and include patients from diverse backgrounds. The study could also collect detailed clinical data to identify areas for improvement and uncover new biomarkers related to survival in CRC. Positive results would be more convincing to clinicians and regulatory bodies. In a different study, Li *et al*[24] developed DL-based prognosis (recurrence risk) using preoperative CT images, and the findings were correlated with several clinicopathological parameters. Integrated nomogram construction in association with clinicopathological features and DL CT image features with paired gene expression profiles were altogether able to predict prognosis in CRC patients. The study incorporated baseline clinicopathological features such as age, sex, tumor stage, lymph node and metastasis status, and differentiation grade.

CONCLUSION

This hospital-based retrospective study possesses limitations due to the limited cohort of participants and lack of multi-center data. The trial lacks defined inclusion and exclusion criteria, which can alter the TIME and thereby the inappropriate pre-operative immunotherapy clinical decisions in CRC patients. Furthermore, lack of baseline clinicopathological features of the study patients limits the applicability of the proposed model in CRC patients. A prospective study design is necessary, incorporating a larger sample size from multiple centers, detailed tumor histopathological data, and expanded inclusion and exclusion criteria to achieve more reliable and generalized outcomes for preoperative immunotherapeutic clinical decisions in CRC patients.

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REFERENCES

- Zhou C**, Zhang YF, Yang ZJ, Huang YQ, Da MX. Computed tomography-based deep learning radiomics model for preoperative prediction of tumor immune microenvironment in colorectal cancer. *World J Gastrointest Oncol* 2025; **17**: 106103 [RCA] [PMID: 40487956 DOI: 10.4251/wjgo.v17.i5.106103] [FullText] [Full Text(PDF)]
- Morgan E**, Arnold M, Gini A, Lorenzoni V, Cabasag CJ, Laversanne M, Vignat J, Ferlay J, Murphy N, Bray F. Global burden of colorectal cancer in 2020 and 2040: incidence and mortality estimates from GLOBOCAN. *Gut* 2023; **72**: 338-344 [RCA] [PMID: 36604116 DOI: 10.1136/gutjnl-2022-327736] [FullText]
- Bray F**, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin* 2018; **68**: 394-424 [RCA] [PMID: 30207593 DOI: 10.3322/caac.21492] [FullText]
- Han F**, Wu G, Zhang S, Zhang J, Zhao Y, Xu J. The association of Metabolic Syndrome and its Components with the Incidence and Survival of Colorectal Cancer: A Systematic Review and Meta-analysis. *Int J Biol Sci* 2021; **17**: 487-497 [RCA] [PMID: 33613107 DOI: 10.7150/ijbs.52452] [FullText] [Full Text(PDF)]
- Botteri E**, Borroni E, Sloan EK, Bagnardi V, Bosetti C, Peveri G, Santucci C, Specchia C, van den Brandt P, Gallus S, Lugo A. Smoking and Colorectal Cancer Risk, Overall and by Molecular Subtypes: A Meta-Analysis. *Am J Gastroenterol* 2020; **115**: 1940-1949 [RCA] [PMID: 32773458 DOI: 10.14309/ajg.0000000000000803] [FullText]
- Cai S**, Li Y, Ding Y, Chen K, Jin M. Alcohol drinking and the risk of colorectal cancer death: a meta-analysis. *Eur J Cancer Prev* 2014; **23**: 532-539 [RCA] [PMID: 25170915 DOI: 10.1097/CEJ.0000000000000076] [FullText]
- Weiss JM**, Gupta S, Burke CA, Axell L, Chen LM, Chung DC, Clayback KM, Dallas S, Felder S, Gbolahan O, Giardiello FM, Grady W, Hall MJ, Hampel H, Hodan R, Idos G, Kanth P, Katona B, Lamps L, Llor X, Lynch PM, Markowitz AJ, Pirzadeh-Miller S, Samadder NJ, Shibata D, Swanson BJ, Szymaniak BM, Wiesner GL, Wolf A, Yurgelun MB, Zakhour M, Darlow SD, Dwyer MA, Campbell M. NCCN Guidelines® Insights: Genetic/Familial High-Risk Assessment: Colorectal, Version 1.2021. *J Natl Compr Canc Netw* 2021; **19**: 1122-1132 [RCA] [PMID: 34666312 DOI: 10.1164/jncn.2021.0048] [FullText]
- Steinke V**, Engel C, Büttner R, Schackert HK, Schmiegel WH, Propping P. Hereditary nonpolyposis colorectal cancer (HNPCC)/Lynch syndrome. *Dtsch Arztebl Int* 2013; **110**: 32-38 [RCA] [PMID: 23413378 DOI: 10.3238/arztebl.2013.0032] [FullText]
- André T**, Shiu KK, Kim TW, Jensen BV, Jensen LH, Punt C, Smith D, Garcia-Carbonero R, Benavides M, Gibbs P, de la Fouchardiere C, Rivera F, Elez E, Bendell J, Le DT, Yoshino T, Van Cutsem E, Yang P, Farooqui MZH, Marinello P, Diaz LA Jr; KEYNOTE-177 Investigators. Pembrolizumab in Microsatellite-Instability-High Advanced Colorectal Cancer. *N Engl J Med* 2020; **383**: 2207-2218 [RCA] [PMID: 33264544 DOI: 10.1056/NEJMoa2017699] [FullText]
- Pagès F**, Mlecnik B, Marliot F, Bindea G, Ou FS, Bifulco C, Lugli A, Zlobec I, Rau TT, Berger MD, Nagtegaal ID, Vink-Börger E, Hartmann A, Geppert C, Kolwelter J, Merkel S, Grützmann R, Van den Eynde M, Jouret-Mourin A, Kartheuser A, Léonard D, Remue C, Wang JY, Bavi P, Roehrl MHA, Ohashi PS, Nguyen LT, Han S, MacGregor HL, Hafezi-Bakhtiari S, Wouters BG, Masucci GV, Andersson EK, Zavadova E, Vocka M, Spacek J, Petruzelka L, Konopasek B, Dundr P, Skalova H, Nemejcova K, Botti G, Tatangelo F, Delrio P, Ciliberto G, Maio M, Laghi L, Grizzi F, Fredriksen T, Buttard B, Angelova M, Vasaturo A, Maby P, Church SE, Angell HK, Lafontaine L, Bruni D, El Sissy C, Haicheur N, Kirilovsky A, Berger A, Lagorce C, Meyers JP, Paustian C, Feng Z, Ballesteros-Merino C, Dijkstra J, van de Water C, van Lent-van Vliet S, Knijn N, Mušić AM, Scripcariu DV, Popivanova B, Xu M, Fujita T, Hazama S, Suzuki N, Nagano H, Okuno K, Torigoe T, Sato N, Furuhashi T, Takemasa I, Itoh K, Patel PS, Vora HH, Shah B, Patel JB, Rajvik KN, Pandya SJ, Shukla SN, Wang Y, Zhang G, Kawakami Y, Marincola FM, Ascierto PA, Sargent DJ, Fox BA, Galon J. International validation of the consensus Immunoscore for the classification of colon cancer: a prognostic and accuracy study. *Lancet* 2018; **391**: 2128-2139 [RCA] [PMID: 29754777 DOI: 10.1016/S0140-6736(18)30789-X] [FullText]
- Delattre JF**, Cohen R, Henriques J, Falcoz A, Emile JF, Fratte S, Chibaudel B, Dauba J, Dupuis O, Bécouarn Y, Bibeau F, Taieb J, Louvet C, Vernerey D, André T, Svrcek M. Prognostic Value of Tumor Deposits for Disease-Free Survival in Patients With Stage III Colon Cancer: A Post Hoc Analysis of the IDEA France Phase III Trial (PRODIGE-GERCOR). *J Clin Oncol* 2020; **38**: 1702-1710 [RCA] [PMID: 32167864 DOI: 10.1200/JCO.19.01960] [FullText]
- Sung SY**, Chung LW. Prostate tumor-stroma interaction: molecular mechanisms and opportunities for therapeutic targeting. *Differentiation* 2002; **70**: 506-521 [RCA] [PMID: 12492493 DOI: 10.1046/j.1432-0436.2002.700905.x] [FullText]
- Foray C**, Barca C, Backhaus P, Schelhaas S, Winkeler A, Viel T, Schäfers M, Grauer O, Jacobs AH, Zinnhardt B. Multimodal Molecular Imaging of the Tumour Microenvironment. *Adv Exp Med Biol* 2020; **1225**: 71-87 [RCA] [PMID: 32030648 DOI: 10.1007/978-3-030-35727-6_5] [FullText]
- Xue C**, Zhou Q, Xi H, Zhou J. Radiomics: A review of current applications and possibilities in the assessment of tumor microenvironment. *Diagn Interv Imaging* 2023; **104**: 113-122 [RCA] [PMID: 36283933 DOI: 10.1016/j.diii.2022.10.008] [FullText]
- Lambin P**, Leijenaar RTH, Deist TM, Peerlings J, de Jong EEC, van Timmeren J, Sanduleanu S, Larue RTHM, Even AJG, Jochems A, van Wijk Y, Woodruff H, van Soest J, Lustberg T, Roelofs E, van Elmpt W, Dekker A, Mottaghy FM, Wildberger JE, Walsh S. Radiomics: the bridge between medical imaging and personalized medicine. *Nat Rev Clin Oncol* 2017; **14**: 749-762 [RCA] [PMID: 28975929 DOI: 10.1038/nrclinonc.2017.141] [FullText]
- Gillies RJ**, Kinahan PE, Hricak H. Radiomics: Images Are More than Pictures, They Are Data. *Radiology* 2016; **278**: 563-577 [RCA] [PMID: 26579733 DOI: 10.1148/radiol.2015151169] [FullText] [Full Text(PDF)]
- Lian J**, Yue Y, Yu W, Zhang Y. Immunosenescence: a key player in cancer development. *J Hematol Oncol* 2020; **13**: 151 [RCA] [PMID: 33168037 DOI: 10.1186/s13045-020-00986-z] [FullText] [Full Text(PDF)]
- Gerber DE**, Pruitt SL, Halm EA. Should criteria for inclusion in cancer clinical trials be expanded? *J Comp Eff Res* 2015; **4**: 289-291 [RCA] [PMID: 26274789 DOI: 10.2217/cer.15.27] [FullText]
- Whiteside TL**. What are regulatory T cells (Treg) regulating in cancer and why? *Semin Cancer Biol* 2012; **22**: 327-334 [RCA] [PMID: 22511111]

- 22465232 DOI: [10.1016/j.semcancer.2012.03.004](https://doi.org/10.1016/j.semcancer.2012.03.004) [FullText]
- 20 **Ahmed H**, Mahmud AR, Siddiquee MF, Shahriar A, Biswas P, Shimul MEK, Ahmed SZ, Ema TI, Rahman N, Khan MA, Mizan MFR, Emran TB. Role of T cells in cancer immunotherapy: Opportunities and challenges. *Cancer Pathog Ther* 2023; **1**: 116-126 [RCA] [PMID: 38328405 DOI: [10.1016/j.cpt.2022.12.002](https://doi.org/10.1016/j.cpt.2022.12.002)] [FullText] [Full Text(PDF)]
- 21 **Wang Q**, Zhong W, Shen X, Hao Z, Wan M, Yang X, An R, Zhu H, Cai H, Li T, Lv Y, Dong X, Chen G, Liu A, Du J. Tertiary lymphoid structures predict survival and response to neoadjuvant therapy in locally advanced rectal cancer. *NPJ Precis Oncol* 2024; **8**: 61 [RCA] [PMID: 38431733 DOI: [10.1038/s41698-024-00533-w](https://doi.org/10.1038/s41698-024-00533-w)] [FullText] [Full Text(PDF)]
- 22 **Mendiola M**, Pellinen T, Ramon-Patino JL, Berjon A, Bruck O, Heredia-Soto V, Turkki R, Escudero J, Hemmes A, Garcia de la Calle LE, Crespo R, Gallego A, Hernandez A, Feliu J, Redondo A. Prognostic implications of tumor-infiltrating T cells in early-stage endometrial cancer. *Mod Pathol* 2022; **35**: 256-265 [RCA] [PMID: 34642425 DOI: [10.1038/s41379-021-00930-7](https://doi.org/10.1038/s41379-021-00930-7)] [FullText]
- 23 **Cui Y**, Zhao K, Meng X, Mao Y, Han C, Shi Z, Yang X, Tong T, Wu L, Liu Z. A computed tomography-based multitask deep learning model for predicting tumour stroma ratio and treatment outcomes in patients with colorectal cancer: a multicentre cohort study. *Int J Surg* 2024; **110**: 2845-2854 [RCA] [PMID: 38348900 DOI: [10.1097/JS9.0000000000001161](https://doi.org/10.1097/JS9.0000000000001161)] [FullText] [Full Text(PDF)]
- 24 **Li CH**, Cai D, Zhong ME, Lv MY, Huang ZP, Zhu Q, Hu C, Qi H, Wu X, Gao F. Multi-Size Deep Learning Based Preoperative Computed Tomography Signature for Prognosis Prediction of Colorectal Cancer. *Front Genet* 2022; **13**: 880093 [RCA] [PMID: 35646105 DOI: [10.3389/fgene.2022.880093](https://doi.org/10.3389/fgene.2022.880093)] [FullText] [Full Text(PDF)]

FOOTNOTES

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