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SPECIALTY SECTION
This article was submitted to
Cancer Immunity
and Immunotherapy,
a section of the journal
Frontiers in Immunology

RECEIVED 27 October 2022
ACCEPTED 13 February 2023
PUBLISHED 23 February 2023

CITATION
Zhang M, Liu K, Zhang Q, Xu J, Liu J,
Lin H, Lin B, Zhu M and Li M (2023)
Alpha fetoprotein promotes polarization
of macrophages towards M2-like
phenotype and inhibits macrophages
to phagocytose hepatoma cells.
Front. Immunol. 14:1081572.
doi: 10.3389/fimmu.2023.1081572

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Alpha fetoprotein promotes polarization of macrophages towards M2-like phenotype and inhibits macrophages to phagocytose hepatoma cells

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Alpha-fetoprotein(AFP) is a cancer biomarker for the diagnosis of hepatocellular carcinoma(HCC); however, its role in macrophage polarization and phagocytosis remains unclear. In the present study, we explored the correlation between AFP regulation of macrophage function and the possible regulatory mechanisms. Human mononuclear leukemia cells (THP-1) and monocytes from healthy donors were used to analyze the effect of AFP on the macrophages' phenotype and phagocytosis. THP-1 cells and healthy human donor-derived monocytes were polarized into M0 macrophages induced by phorbol ester (PMA), and M0 macrophages were polarized into M1 macrophages induced by lipopolysaccharide(LPS) and interferon- γ (IFN- γ). Interleukin-4(IL-4) and interleukin-13(IL-13) were used to induce M0 macrophage polarization into M2 macrophages. Tumor-derived AFP(dAFP) stimulated M0 macrophage polarization into M2 macrophages and inhibited M1 macrophages to phagocytose HCC cells. The role of AFP in promoting macrophage polarization into M2 macrophages and inhibiting the M1 macrophages to phagocytose HCC cells may be involved in activating the PI3K/Akt signaling pathway. AFP could also enhanced the migration ability of macrophages and inhibited the apoptosis of HCC cells when co-cultured with M1-like macrophages. AFP is a pivotal cytokine that inhibits macrophages to phagocytose HCC cells.

KEYWORDS

alpha-fetoprotein, macrophage polarization, PI3K/AKT signaling, macrophage phagocytosis, immune escape

Abbreviations: AFP, alpha-fetoprotein; HCC, hepatocellular carcinoma; shAFP, short hairpin RNA that suppresses AFP; PMA, phorbol 12-myristate 13-acetate; IFN- γ , interferon- γ ; LPS, lipopolysaccharide; IL, interleukin; iNOS, inducible nitric oxide synthase; MHC, major histocompatibility complex; NF- κ B, nuclear factor kappa-B; PD-1, programmed cell death protein 1; PI3K, phosphatidylinositol 3-kinase; PTEN, phosphatase and tension homology deleted on chromosome ten; TAMs, tumor-associated macrophages; TME, tumor microenvironment; TNF- α , tumor necrosis factor- α ; ROS, reactive oxygen species.

Alpha Fetoprotein And Hepatoma

Yujin Hoshida



Alpha Fetoprotein And Hepatoma:

Alpha-fetoprotein and Hepatoma Hidematsu Hirai, Tōru Miyaji, 1973 **Hepatocellular Carcinoma** W. Y. Lau, 2008-01-01 1 Epidemiology Trishe Y M Leong and Anthony S Y Leong 2 Liver terminology and anatomy Steven M Strasberg 3 Assessment of liver function Darren V Mann 4 Prevention Michael C Kew 5 Screening Morris Sherman 6 Presentation and diagnosis Dario Ribero Gareth Morris Stiff and Jean Nicolas Vauthey 7 Tumor markers John Y H Chan and Zhi Wang 8 Imaging Simon S M Ho and Simon C H Yu 9 Pathology Anthony S Y Leong Trishe Y M Leong and Pongsak Wannakrairot 10 Molecular aspects John Y H Chan Kenneth K H Lee Yiu Loon Chui and Macus T Kuo 11 Staging Justin M Burns and Frederick L Greene 12 Selection of patients for liver resection Eric C H Lai W Y Lau and Darren V Mann 13 Problems associated with liver resection in cirrhotic patients Cheng Chung Wu 14 Preoperative portal vein embolization Takuya Hashimoto and Masatoshi Makuuchi 15 Intraoperative ultrasound Guido Torzilli and Henri Bismuth 16 Surgical treatment Jacques Belghiti 17 Anterior approach using the hanging technique Jacques Belghiti and Barbara Alkofer 18 Segment based liver resection W Y Lau and Eric C H Lai 19 Intrahepatic glissonian approach Bernard Launois and Khoon Hean Tay 20 Ultrasonically guided segmentectomy and subsegmentectomy Taku Aoki Norihiro Kokudo and Masatoshi Makuuchi 21 Isolated caudate lobe resection resection of Couinaud segment 1 Shu You Peng 22 Laparoscopic Liver Resection Rong Liu 23 Techniques of vascular control and protective strategies for parenchymal transection Markus K M Iler Henrik Petrowsky and Pierre Alain Clavien 24 Techniques of liver transection Eric T Castaldo and C Wright Pinson 25 Radiofrequency assisted liver resection Long R Jiao and Nagy A Habib 26 Cytoreductive tumor debulking surgery Eric C H Lai and W Y Lau 27 Cryosurgery George Petrou and David L Morris 28 Liver transplantation Chao Long Chen and Allan M Concejero 29 Local ablative therapy Tito Livraghi 30 Regional therapy W Y Lau and Eric C H Lai 31 Systemic chemotherapy Thomas W T Leung 32 Neoadjuvant adjuvant chemoprevention therapy and tumor downstaging W Y Lau and Eric C H Lai 33 Management of portal vein tumor thrombus W Y Lau Eric C H Lai and Simon C H Yu 34 Palliative care Winnie Yeo and Anthony T C Chan 35 Management of specific complications Eric C H Lai and W Y Lau 36 Management of acute liver failure A R Nitin Rao 37 Extracorporeal energy therapy Eric C H Lai and W Y Lau *Hepatocellular Carcinoma: Kelly M. McMasters*, 2010-11-30 **Hepatocellular Carcinoma Targeted Therapy** provides a detailed repository of the latest information regarding HCC epidemiology diagnosis imaging pathology staging and treatment options This volume also provides an up to date guide for treatment that explores not only traditional treatments but newer investigational treatment options including surgical resection liver transplantation ablation radiofrequency microwave percutaneous ethanol or acetic acid injection transarterial chemoembolization TACE intra arterial radiation therapy and systemic chemotherapy Hepatocellular Carcinoma Targeted Therapy will be of great value to all health care professionals and trainees worldwide who have an interest in the diagnosis and treatment of HCC including surgeons medical oncologists radiologists radiation oncologists and pathologists

Hepatocellular Carcinoma Brian I. Carr,2009-10-03 Hepatocellular cancer is the fifth most common cancer with 600 000 new cases reported each year worldwide Additionally exciting changes in the science of HCC in the last four years have turned the practice of diagnosing and treating the disease upside down In *Hepatocellular Carcinoma Diagnosis and Treatment* Second Edition the leading experts in the field of HCC thoroughly update and expand upon the critically acclaimed first edition with all the latest developments in the diagnosis and treatment of primary liver cancer The book details for physicians the diagnostic and therapeutic decision making process for dealing with such problems as incidental tumors in the liver transplant the role of neo adjuvant chemotherapy intra arterial vs intravenous therapy the uses of embolization and the significance of portal vein thrombus New chapters discuss the introduction into clinical practice of cell cycle growth inhibitors an expanded knowledge of Genomics and Proteomics and novel ways of delivering intra hepatic chemotherapy This cutting edge text is a vital resource and must have for today s hepatologists and medical and surgical oncologists *Diagnosis and Therapy of Hepatocellular Carcinoma: Status Quo and a Glimpse at the Future, An Issue of Clinics in Liver Disease* Adrian Reuben,2011-07-20 Dr Adrian Reuben updates one of the most highly requested topics in liver disease by inviting highly distinguished authors to address the important aspects of diagnosis and treatment of hepatocellular carcinoma State of the art issues are addressed including the role of oncogenic viruses molecular and genetic guidelines and screening and staging Dr Reuben himself concludes the issue with an important article on an algorithmic approach to diagnosis and treatment Resect Ablate Replace or Intoxicate Alpha-fetoprotein and Congenital Disorders Gerald J. Mizejewski,Ian H. Porter,1985 **Navigating the Management of Hepatocellular Carcinoma, An Issue of Clinics in Liver Disease** Mitchell L Shiffman,2024-11-28 In this issue of *Clinics in Liver Disease* guest editor Dr Mitchell L Shiffman brings his considerable expertise to the topic of Navigating the Management of Hepatocellular Carcinoma Incidence rates of hepatocellular carcinoma HCC have more than tripled since 1980 and death rates have more than doubled during this time This issue addresses diagnosis treatment modalities and surveillance all with real world approaches Selected articles include case histories revealing how and why decisions were made Contains 12 relevant practice oriented topics including diagnosis and staging of HCC real world management of HCC selected case presentations highlighting the dilemmas of surveillance systemic therapy for HCC real world management of HCC selected case presentations and how treatment decisions are made management of chronic liver disease in patients with HCC and more Provides in depth clinical reviews on the management of hepatocellular carcinoma offering actionable insights for clinical practice Presents the latest information on this timely focused topic under the leadership of experienced editors in the field Authors synthesize and distill the latest research and practice guidelines to create clinically significant topic based reviews Hepatocellular Carcinoma Bandar Al Knawy,K. Rajender Reddy,Luigi Bolondi,2009-08-27 An essential resource for gastroenterologists hepatologists liver surgeons hepatobiliary surgeons oncologists and all those working in the field of hepatocellular carcinoma HCC Hepatocellular

Carcinoma A Practical Approach covers the updates and recent developments on the diagnosis screening and comprehensive medical and surgical management Hepatocellular Carcinoma Nagy A. Habib,2008-02-01 Advances in molecular characterization and novel gene isolation techniques have vigorously expanded our understanding of hepatocellular carcinoma HCC a form of liver cancer that affects one million people annually and generated many new therapeutic possibilities In Hepatocellular Carcinoma Methods and Protocols Nagy Habib and a team of basic and clinical researchers describe the wide variety of powerful new laboratory based molecular methods currently being used for investigating and treating this disease The book focuses on gene therapy approaches including the use of such vectors as lipids adenovirus and baculovirus and virus detection assessment using electron microscopy It also provides preclinical and clinical data on the killing of cancer cells using tumor suppressor genes antisense compounds to growth factors immunotherapy remove gene and virus directed enzyme prodrug therapy A perspective on future treatment of the failing liver is given along with a clinical protocol for p53 gene therapy Hepatocellular Carcinoma Methods and Protocols offers experimental and clinical investigators a rich source of both basic science and clinical information on today s optimal use of gene therapy to treat and manage patients suffering from hepatocellular carcinoma **Identification of Novel Biomarkers for Pancreatic and Hepatocellular Cancers** Brendan Jenkins,Alessandro Passardi,Qingfeng Zhu,Zhaohui Huang,2022-12-02 **Primary Liver Cancer** Jianren Gu,2012-12-02 Primary Liver Cancer Challenges and Perspectives presents the recent progress in basic and clinical research in Primary Liver Cancer PLC in China and around the world PLC patients in China make up more than 50% of the total patients worldwide By contributing to the book the leading experts in the field of liver cancer in China as well as in the US share with readers their new concepts practices and experiences from bench to bed from population study to individual survey from molecular search to clinical practice and from early diagnosis to treatment The book is intended for researchers in the fields of epidemiology molecular genetics cell biology immunology of HCC and other cancers and clinical oncology in primary liver cancer Jianren Gu is a Professor of molecular oncology at the Shanghai Cancer Institute Shanghai Jiao Tong University School of Medicine and Academician of Chinese Academy of Engineering **Serum Alpha-fetoprotein (afp) And/or Ultrasound (us) for Hepatocellular Carcinoma (hcc) Screening , Cumulated Index Medicus ,1974**

Predictive biomarkers for systemic or combination therapy in unresectable hepatocellular carcinoma Xiong Chen,Lujun Shen,Wenyu Lin,2023-07-26 Biomarkers in Medicine Pinar Atukeren,Hafize Uzun,2022-09-01 Biomarkers in Medicine is a comprehensive guide to understanding the current and future status of biomarkers The book features 27 chapters focusing on disease biomarkers for diseases such as cancer neurodegenerative diseases cardiac diseases metabolic conditions and much more This book supplies readers with the unique insight of experts in multiple specialties in medicine and life sciences who have extensive experience in diagnostics and clinical laboratories The book includes case studies and practical examples from different classes of biomarkers on different platforms including new data for biomarkers in different

therapeutic indications In addition to presenting biomarker information each chapter covers the relevant pathology and also emphasizes on preclinical and clinical manifestation of the disease process Clinicians managing patients or clinical trials clinical researchers clinical laboratories diagnostic companies regulatory agencies medical school graduate students academic students and the general public involved in healthcare delivery will all benefit from information presented in this book

Malignant Liver Tumors Pierre-Alain Clavien,Yuman Fong,2004 This classic reference has been completely revised and updated by a renowned team of editors to produce the most current comprehensive and authoritative book available on treating liver cancer Clearly written carefully edited and impeccably referenced Malignant Liver Tumors Second Edition provides the latest information on traditional and cutting edge surgical approaches new and emerging drugs and their new generation of delivery systems radiation therapy approach to special patients and much more Expanded to 36 comprehensive but concise chapters by more than 60 world experts and with over 200 illustrations this new edition is an invaluable resource for all cancer care professionals who treat patients with liver tumors This new edition will cover in 36 concise chapters with over 200 illustrations the latest drugs and their delivery systems new generation of pumps including biotherapies advances in radiation oncology and the most recent surgical approaches This book is an essential resource for anyone who treats cancer patients including oncologists radiotherapists and surgeons

Hepatocellular Carcinoma Yujin Hoshida,2019-08-05 This book provides a comprehensive overview of the current limitations and unmet needs in Hepatocellular Carcinoma HCC diagnosis treatment and prevention It also provides newly emerging concepts approaches and technologies to address challenges Topics covered include changing landscape of HCC etiologies in association with health disparities framework of clinical management algorithm new and experimental modalities of HCC diagnosis and prognostication multidisciplinary treatment options including rapidly evolving molecular targeted therapies and immune therapies multi omics molecular characterization and clinically relevant experimental models The book is intended to assist collaboration between the diverse disciplines and facilitate forward and reverse translation between basic and clinical research by providing a comprehensive overview of relevant areas covering epidemiological trend and population level patient management strategies new diagnostic and prognostic tools recent advances in the standard care and novel therapeutic approaches and new concepts in pathogenesis and experimental approaches and tools by experts and opinion leaders in their respective fields By thoroughly and concisely covering whole aspects of HCC care Hepatocellular Carcinoma serves as a valuable reference for multidisciplinary readers and promotes the development of personalized precision care strategies that lead to substantial improvement of disease burden and patient prognosis in HCC

Molecular Aspects of Hepatocellular Carcinoma Liang Qiao,Yumin Li,Xiang Yan,Jacob George,2012 Therapeutic options for late stage liver cancer are very limited and the prognosis is often poor A better understanding of the molecular mechanisms involved in the initiation progression and metastasis of hepatocellular carcinoma is critical for developing more rational diagnostic and

therapeutic approaches This e book covers current developments on clinically relevant research on the molecular biology of hepatocellular carcinoma This e book should be a valuable reference for professional gastroenterologists hepatologists and oncologists as well as medical students and researchers **Journal** National Cancer Institute (U.S.),1975 **Journal of the National Cancer Institute** ,1981

Reviewing **Alpha Fetoprotein And Hepatoma**: Unlocking the Spellbinding Force of Linguistics

In a fast-paced world fueled by information and interconnectivity, the spellbinding force of linguistics has acquired newfound prominence. Its capacity to evoke emotions, stimulate contemplation, and stimulate metamorphosis is actually astonishing. Within the pages of "**Alpha Fetoprotein And Hepatoma**," an enthralling opus penned by a very acclaimed wordsmith, readers embark on an immersive expedition to unravel the intricate significance of language and its indelible imprint on our lives. Throughout this assessment, we shall delve in to the book is central motifs, appraise its distinctive narrative style, and gauge its overarching influence on the minds of its readers.

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