Progress in the relationship between ADAM family and tumor

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Introduction. The unique structure and biological function of desintegrin and metalloproteinase and ADAM s) family have become a focus of research in recent years. ADAM s Is involved in the development and development of various diseases, and its expression is elevated in various malignant tumors. In addition, ADAM s is involved in physiological processes such as fertilization, myogenesis, neurogenesis, and cell-cell interactions.
Keywords. disintegrin and metalloprotease family; malignant tumor; physiological process

INTRODUCTION

As morbidity and mortality continue to rise, tumors have become a serious type of disease threat to human life and health. At present, the clinical treatment of tumor includes traditional surgical treatment, chemotherapy, radiotherapy, etc. In addition, with the technological progress, it has gradually changed from the traditional way to precision medical treatment, including new molecular targeted therapy, biological immunotherapy, endocrine therapy, etc[1]。Traditional treatments are limitations, damage normal cells, serious adverse reactions and many complications. However, novel molecular targeted therapy targets specific molecular targets of tumor cells and has relatively little effect on normal cells[2]. Therefore, it is urgent to find the pathological markers that can reflect the tumor characteristics and target them to carry out tumor treatment.

1 STRUCTURE AND PHYSIOLOGICAL FUNCTION OF ADAMs

The ADAMs (a disintegrin and Metalloprotease) family. Namely, the family of desintegrin-beta-metalloproteases[3], Is a type I transmembrane protein (the total family of zinc-containing proteases) that is critical in regulating cell-cell and cell-matrix interactions. To date, more than 30 species of ADAM have been found in mammalian and non-mammalian species, as well as in normal animal cells and tumor cells cultured in vitro[4]. The ADAM family is implicated in membrane fusion, shedding of cytokines and growth factors, control of cell migration, and determination of certain processes such as muscle development, fertilization, and cellular outcome.

Pathology, such as inflammation and tumors are also greatly affected by the ADAM family.

ADAMs include leading domains, metalloprotease domain and deintegrin domain, which are involved in the occurrence and development of various inflammatory diseases, and play important roles in blood vessel formation, cell adhesion, migration and signal transduction[5]. This paper focuses on the relationship between the ADAM family and the tumor.

2 ADAMs, AND THE DETECTION METHOD OF THE

At present, the common detection methods of ADAMs include immunoblot test (WB), immunohistochemical staining (IHC), enzyme-linked immunosorbent test (ELISA), flow cytometry (FCM) real-time PCR (qPCR) and other methods[6]; Microarray technology (microarray) has the advantages of small size, low cost, fast analysis speed, high sensitivity and microconsumption of reagents[7]。

3 THE RELATIONSHIP BETWEEN ADAMs AND MALIGNANCY

3.1 ADAM 8 and the associated tumors

Some studies have found that the high expression of ADAM-8 is associated with a variety of tumors and can promote its metastasis and progression[8]。 Pianetti[9]Have demonstrated that ADAM 8 is widely expressed in breast cancer and high ADAM 8 expression established that patients are at risk for poor survival. One study demonstrated that blood ADAM-8 levels are closely related with the development of gastric cancer and are expected to be a biomarker of gastric cancer[10]。

3.2 ADAM 9, together with the associated tumors

BREUN class[11]Found that ADAM 9 was specifically overexpressed in the Schwann cells of the vestibular schwannoma and not in normal nerves. Its expression level was significantly correlated with the patient's hearing loss.

FENG class[12]After experiments, it was concluded that overexpression of miR-1274a could inhibit the proliferation, migration and invasion of OS cells and participate in tumor progression by targeting ADAM9. HOU class[13]Found that ASMTL-AS1 aggravated OS progression by modulating the miR-342-3p / ADAM 9 axis. GAO class[14]The experiments confirmed that overexpression of miR-502-5p reduced OXA resistance, proliferation and metastasis of OXA-resistant GC (GC) cells by downregulating ADAM 9 expression.

3.3 ADAM10 with the associated tumors

VAN class[15]Found that deletion of ADAM17 and ADAM10 / 17 reduced the tumorigenic and migratory potential of retinoblastoma cells in vivo, and that ADAMs are potential new targets for future therapeutic RB approaches.

Inhibition of ADAM10 affecting leukemia-niche interactions and eliminating leukemic stem cells can promote the antileukemic effects of conventional chemotherapy[16]. It has been reported abroad that targeting ADAM-10 by CAR-T cell therapy is a potential new approach for the treatment of colorectal cancer[17]。

3.4 ADAM15 with the associated tumors

Puig-Blasco[18]It is speculated that targeted ADAM15 therapy can increase the infiltration of immune cells in colorectal tumors, laying a foundation for effective immune treatment and therapy. Downregulation of ADAM15 can promote the apoptosis of HCC (HCC) cells and inhibit the proliferation, migration and invasion of HCC cells. Overexpression of ADAM15 has the opposite result. In summary, Xu et al[19]Found that ADAM15 is associated with poor prognosis in HCC patients.

3.5 ADAM17 with the associated tumors

And AmeliMojarad et al[20]The results showed that miR-338-3p overexpression, later, will inhibit cell migration and invasion by inhibiting ADAM17 in gastric cancer cells. Hong class[21]The findings are the first evidence that miR-338-3p targets ADAM17 and blocks the development of hypopharyngeal carcinoma through the wnt / β -catenin signaling pathway. Qu uniform[22]The results indicate that ARPC5 is activated by KLF 4 and upregulates ADAM17 to promote prostate cancer progression.

4 SUMMARY AND OUTLOOK

With the intensive study of ADAM s's biological characteristics and functions, its role in disease diagnosis and treatment has received increasing attention. ADAM s is involved in various physiological and pathological processes in human body, especially in malignant tumors. High ADAM s expression is closely related to the proliferation, migration, invasion of tumor cells and the prognosis of patients. Precision medicine is gradually replacing the traditional tumor treatment techniques, and significant biotechnology advances are changing the way of cancer treatment.

Using the relevant inhibition or promotion of ADAM s in tumors enables us to identify new cancer treatments, as well as to create personalized drugs or immunotherapies.

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