ANTICA-201

Overview

Drug Name	ANTICA-201
Description	The humanized monoclonal antibody ANTICA-201 was generated to recognize carbohydrate-associated epitopes of a cancer-cell expressed glycoprotein, designated as CA215, located in the variable regions of heavy chain immunoglobulins. CA215 is only expressed on the surface of cancer cells from the ovary, cervix, lung, and liver, but absent on normal cells.In vivo experiments have demonstrated ANTICA-201 to be an ideal candidate of an anti-cancer drug or a therapeutic treatment.
Target	CA215
Drug Modality	Monoclonal antibody
Indication	Cancer
Product Category	Cancer immunotherapy
Mechanism of Action	Binding to CA215 expressed by tumor cells to induce apoptosis and complement-dependent cytotoxicity reactions to cancer cells.
Status	Preclinical
Patent	Granted

Collaboration Opportunity

Protheragen Inc. is actively seeking partnership to further develop ANTICA-201. Potential collaboration can be strategic alliance, licensing, or marketing agreement.We look forward to hearing from you.

Target

CA215

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Introduction	CA215, a cancer-associated antigen with molecular weight of approximately 60 KDa, has not yet been developed for medical use. The carbohydrate-associated epitopes of CA215 with pH-sensitive immunoactivity appear to be present only on cancer cell-derived, not non-pathological, immunoglobulins. Compared to normal immunoglobulin G, CA215 contains a significantly higher percentage of N-acetyl and N-glycoylneuraminic acid in the O-linked glycans, and a lower percentage of N-acetylglucosamine in the N-linked ones.
Molecular Size	50 to 70 KDa
Expression Form	Both secreted and membrane-bound monomeric forms
Location	The variable domain of human immunoglobulin heavy chains

Clinical Resources

Major Conditions	Cancer

Drug Modality

Monoclonal Antibody

ANTICA-201 is a humanized monoclonal antibody that could specially recognize the unique carbohydrate-associated epitopes of CA215 on the surface of human cancerous tissues. As an anti-cancer candidate drug, ANTICA-201 reduced the tumor size and had no apparent toxicity in animal models.

Indication

Cancer Cells Expressing CA215

Extensive IHC studies were performed on cancer cells of different human tissues. As shown in table below, cancer tissues from ovary, cervix, endometrium, stomach, esophagus and colon revealed greater than 50% of positive staining using ANTICA-201 monoclonal antibody. Breast and lung cancer tissues exhibited only 30-35% of positive staining. Benign ovarian tumor specimens gave a significantly lower percentage of positive

staining by ovary.

Summarized results of immunohistochemical staining of cancer tissues in humans

Cancer tissues (Case No.)	Positive cases	Negative cases	Percentage positive (%)
Ovary (87)	56	31	64.4
Cervix (51)	43	8	84.3
Endometrium (36)	28	8	77.8
Stomach (93)	46	47	49.5
Colon (87)	38	49	43.6
Esophagus (56)	40	16	75.7
Lung (58)	18	40	31
Breast (59)	19	40	32.2
Liver (60)	2	58	3.5
Prostate (22)	2	20	9.1
Ovary (Benign) (31)	2	29	6.5

Cervix Cancer	Cervical cancer, the malignant tumor of the uterine cervix, is one of the most serious causes of cancer morbidity and mortality among women worldwide. The International Agency for Research on Cancer (IARC) estimated that 569,847 cases of cervical cancer were diagnosed worldwide in 2018. Squamous cell carcinomas arising from the metaplastic squamous epithelium of the cervical transformation zone account for approximately 70% of all cases of cervical cancer. Cervical adenocarcinomas arising from the columnar epithelium of the endocervix account for 25% of the cases in the U.S., and the number is increasing. Adenosquamous carcinoma, the least common form, accounts for 3-5% of all cases.Invasive cervical carcinoma requires aggressive and often multicomponent therapy including surgery, external-beam radiation, brachytherapy, and chemotherapy. Typically, early cervical cancer is treated surgically, while concurrent chemoradiotherapy is the preferred modality for locally advanced cervical cancer.
Endometrial Cancer	Endometrial cancer (EC) originates in the endometrium, the inner lining of the body of the uterus (corpus uteri), and is classified into type I or type II. EC is the fifth most common cancer in women worldwide and continues to increase in both incidence (by 1-2% yearly) as well as prevalence. Although the prevalence of endometrial cancer is high, the mortality-to-incidence ratio is lower than that of other gynecological malignancies. Most patients do well with surgery alone. Five-

	year survival rates for women with FIGO stage I-II endometrial cancer range from 74% to 91%.
Esophageal Cancer	Esophageal cancer refers to a malignant tumor of the esophagus which is the tube that connects the throat with the stomach. The two main sub-types of the disease are esophageal squamous cell carcinoma (ESCC) and esophageal adenocarcinoma (EAC). Esophageal cancer is the eighth most frequently diagnosed cancer worldwide. Because of its poor prognosis, it is the sixth most common cause of cancer-related death.In general, a combined approach that includes surgery may be considered as a curative intention of localized esophageal cancer. In the case of disease that is widespread and metastatic, chemotherapy may be used to lengthen survival, while treatments such as radiotherapy or stenting may be used to relieve symptoms and ease swallowing.
Ovarian Cancer	Ovarian cancer typically spreads via local shedding into the peritoneal cavity, followed by the implantation of high-grade papillary serous tumors on the peritoneum and local invasion of the bowel and bladder. The cancer spreading to pelvic lymph nodes is also common and it increases with the stages of disease. According to Globocan data for 2018, the global incidence of ovarian cancer would be 295,414, and the five-year survival rate in average is 30-40%.At present, the two main ovarian cancer therapies are surgery and chemotherapy, alone or in combination depending upon the characteristics of individual patient and tumor.

Mechanism of Action

Binding to CA215 to Induce Lysis and Apoptosis of Cancer Cells

Immunoglobulin expressed on the surface of most cancer cells may be a specifically recognized target of ANTICA-201. Biological and immunological studies have also shown that ANTICA-201 can induce apoptosis of cancer cells, as well as the CDC response in the presence of complement. This response induces cleavage of cultured cancer cells. As demonstrated by experiments using several nude mouse models, within a certain range, increased dosage of ANTICA-201 significantly reduced the tumor volume.Two strategies can potentially be used to developing anti-cancer drugs from ANTICA-201. One is passive immunity by ANTICA-201 to treat cancer patients. The other is CAR-T cell therapy packaged with ANTICA-201 Fab domain.

Status

The Status of ANTICA-201

Patents have been granted worldwide on ANTICA-201 monoclonal antibody and the relevant use.

Data

Please feel free to contact us for non-confidential data.

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