

B6-hCEACAM5 (BAC-TG)

Strain Name: C57BL/6JGpt-Tg(hCEACAM5)/Gpt

Strain Type: BAC-TG

Strain Number: T058753

Background: C57BL/6JGpt

Description

CEACAM5 (CEA Cell Adhesion Molecule 5) encodes a cell surface glycoprotein that represents the founding member of the carcinoembryonic antigen (CEA) family of proteins.

The members of the CEACAM family were reported to participate in cancerous growth and invasion by acting as either tumor suppressors or poor prognostic markers for the progression of malignancies ^[1-3]. CEACAM5 is upregulated in approximately 90% of gastrointestinal, colorectal, and pancreatic cancers and 50% of breast cancers ^[4]. CEACAM5 has been applied in the clinical detection of liver metastasis, colorectal cancer, and colon cancer relapse ^[5]. Notably, CEACAM5 is commonly used as an accepted tumor biomarker and indicator of recurrence in patients with cancer, especially those with colorectal cancer.

CEACAM5 has been functionally associated with tumor differentiation, invasion, and metastasis ^[6-7]. Multiple therapeutic approaches to target CEACAM5 in cancer are in development including vaccines, bispecific T-cell engagers, chimeric antigen receptor T-cell therapies, and antibody-drug conjugates (ADCs).

B6-hCEACAM5(BAC-TG) was inserted into the genome of human CEACAM5 on the background of C57BL/6JGpt mice. After preliminary verification, the model successfully expressed human CEACAM5 protein, and can be used to evaluate the efficacy and safety of human therapeutic CEACAM5 antibody.

Strategy



Fig.1 The CEACAM5 gene humanization strategy

Human CEACAM5 was randomly integrated into the genome.

Applications

1. Efficacy evaluation of human CEACAM5 therapy drugs, such as screening of anti-CD3/CEACAM5 bispecific antibody or ADC therapeutic target CEACAM5
2. Safety evaluation of human CEACAM5 antibody

Data support

1. Detection of CEACAM5 mRNA expression

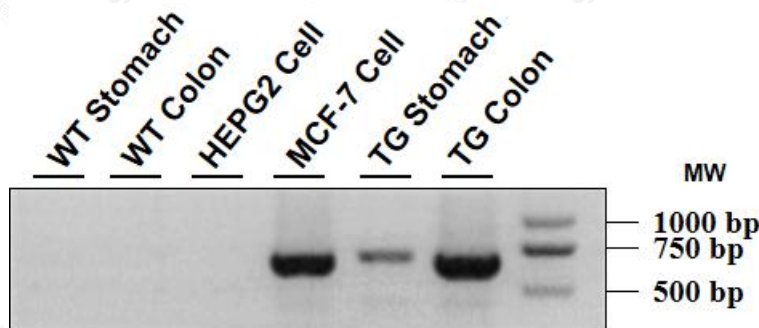


Fig 2. Detection of hCEACAM5 mRNA expression in B6-hCEACAM5(BAC-TG) mice.

The human CEACAM5 mRNA expression was detected in B6 and B6-hCEACAM5(BAC-TG) mice, and it was successfully detected in B6-hCEACAM5(BAC-TG) mice.

2. Detection of CEACAM5 protein expression

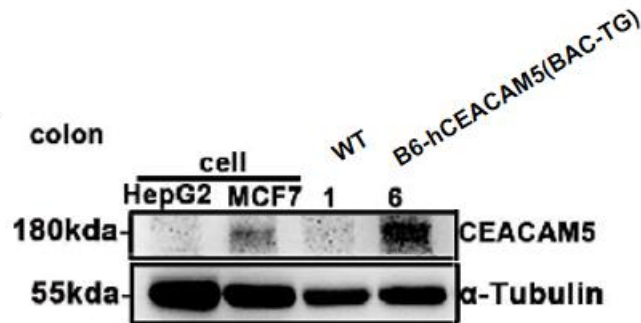


Fig 3. Detection of hCEACAM5 protein expression in B6-hCEACAM5(BAC-TG) mice.

CEACAM5 expression was detected by Western Blot with an anti-CEACAM5 antibody (ABclonal, A18131). The CEACAM5 protein was successfully detected in the B6-hCEACAM5(BAC-TG) mice.

References

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3. Scheffrahn I, Singer BB, Sigmundsson K, et al. Control of density-dependent, cell state-specific signal transduction by the cell adhesion molecule CEACAM1, and its influence on cell cycle regulation. *Exp Cell Res* 2005; 307: 427–435.
4. Thompson JA, Grunert F, Zimmermann W. Carcinoembryonic antigen gene family: molecular biology and clinical perspectives. *J Clin Lab Anal* 1991; 5: 344–366.
5. Zhou J, Fan X, Chen N, et al. Identification of CEACAM5 as a Biomarker for Prewarning and Prognosis in Gastric Cancer. *J Histochem Cytochem* 2015; 63: 922–930.
6. Hashino J, Fukuda Y, Oikawa S, Nakazato H, Nakanishi T. Metastatic potential of human colorectal carcinoma SW1222 cells transfected with cDNA encoding carcinoembryonic antigen. *Clin Exp Metastasis* 1994;12:324–8.
7. Powell E, Shao J, Picon HM, Bristow C, Ge Z, Peoples M, et al A functional genomic screen in vivo identifies CEACAM5 as a clinically relevant driver of breast cancer metastasis. *NPJ Breast Cancer* 2018;4:9.