target cells without peptide pulse. Thus, HIG2-A0206-9-4 can induce potent CTL lines against the target cells which express HLA-A0206.

[0120] Establishment for CTL clones stimulated with HIG2 derived peptides

The limiting dilution from these CTL lines was performed according to the protocols set forth in the "Materials and Methods" section above. The establishment of a CTL clone from HIG2-A0206-9-4 (SEQ ID NO: 1) CTL line is shown in Figure 3. These CTL clones had potent and specific CTL activities against the peptide-pulsed target as compared to the activities against target without peptide pulse.

[0121] Specific CTL activity against the target cells expressing HIG2 and HLA-A0206

The established CTL clones raised against HIG2-A0206-9-4 (SEQ ID NO: 1) were examined for their ability to recognize the target cells expressing HIG2 and HLA-A0206. Specific CTL activity against COS7 transfected with both full length HIG2 gene and the HLA- A0206 molecule, which serves as a specific model for the target cells endogenously express HIG2 and HLA-A0206, was tested using as effector cells the CTL clone raised by HIG2-A0206-9-4 (SEQ ID NO: 1). COS7 transfected with HLA-A0206 ~~full length HIG2~~ but not ~~HLA-A0206~~full length HIG2 and pulsed with other peptide (HIG2-9-8:YLLGVVLTL) and COS7 transfected with ~~HLA-A0206~~full length HIG2 but not ~~full length HIG2~~HLA-A0206 were prepared as controls. The CTL clones demonstrating the highest specific CTL activity against COS7 were those transfected with both HIG2 and HLA-A0206 (Figure 4).

[0122] The results herein clearly demonstrate that HIG2-A0206-9-4 (SEQ ID NO: 1) is naturally processed and presented on the target cell surface with HLA-A0206 molecule and recognize CTL. Therefore, HIG2-A0206-9-4 may serve as a cancer vaccine targeting HIG2 expressed cancer cells in a subject whose HLA antigen is HLA-A0206.

[0123] CTL induction with the peptide from URLC10 restricted with HLA-A0206 and establishment for CTL lines stimulated with URLC10 derived peptides

CTLs for the peptides derived from URLC10 were generated according to the protocols as described in "Materials and Methods". Peptide specific CTL activity was determined by IFN-gamma ELISPOT assay (Figure 5). The results herein show that URLC10-A0206-10-211 (SEQ ID NO: 2) demonstrates potent IFN-gamma production as compared to the control wells. Furthermore, the cells in the positive well number 7 stimulated with SEQ ID NO: 2 were expanded and established CTL line. CTL activity of the CTL line was determined by IFN-gamma ELISA assay (Figure 6). The result herein show that CTL line demonstrates potent IFN-gamma production against the target cells pulsed with corresponding peptide as compared to target cells without peptide pulse. Thus, URLC10-A0206-10-211 can induce potent CTL line.

[0124] Establishment for CTL clone stimulated with URLC10 derived peptide

The limiting dilution from these CTL line was performed according to the protocols

set forth in the "Materials and Methods" section above. The establishment of CTL clone from URLC10-A0206-10-211 (SEQ ID NO: 2) CTL line is shown in Figure 7. This CTL clone has potent and specific CTL activity against the peptide-pulsed target as compared to the activities against target without peptide pulse.

[0125] Specific CTL activity against the target cells expressing URLC10 and HLA-A0206
The established CTL clones raised against URLC10-A0206-10-211 (SEQ ID NO: 2) were examined for their ability to recognize the target cells expressing URLC10 and HLA-A0206. Specific CTL activity against COS7 transfected with both full length URLC10 gene and the HLA- A0206 molecule, which serves as a specific model for the target cells endogenously express URLC10 and HLA-A0206, was tested using as effector cells the CTL clone raised by URLC10-A0206-10-211 (SEQ ID NO: 2). COS7 transfected with full length URLC10 but not HLA-A0206 and COS7 transfected with HLA-A0206 but not full length URLC10 were prepared as controls. The CTL clone demonstrating the highest specific CTL activity against COS7 was that transfected with both URLC10and HLA-A0206 (Figure 8).

[0126] The results herein clearly demonstrate that URLC10-A0206-10-211 (SEQ ID NO: ~~162~~) is naturally processed and presented on the target cell surface with HLA-A0206 molecule and recognize CTL. Furthermore, URLC10-A0206-10-211 may serve as a cancer vaccine targeting URLC10 expressed cancer cells in a subject whose HLA antigen is HLA-A0206.

[0127] In conclusion, novel HLA-A0206 epitope peptides HIG2-A0206-9-4 (SEQ ID NO: 1) and URLC10-A0206-10-211 (SEQ ID NO: 2) were identified and demonstrate as applicable for cancer immunotherapy in a subject whose HLA-A antigen is HLA-A0206.

Industrial Applicability

[0128] The present invention describes new TAAs, particularly those derived from HIG2 or URLC10 that induce potent and specific anti-tumor immune responses and have applicability to a wide array of cancer types. Such TAAs warrant further development as peptide vaccines against diseases associated with HIG2 or URLC10, e.g., cancers such as bladder cancer, cervical cancer, cholangiocellular carcinoma, esophagus cancer, gastric cancer, non-small cell lung cancer (NSCLC), osteosarcoma, pancreatic cancer, renal carcinoma and soft tissue tumor.

[0129] While the invention is herein described in detail and with reference to specific embodiments thereof, it is to be understood that the foregoing description is exemplary and explanatory in nature and is intended to illustrate the invention and its preferred embodiments. Through routine experimentation, one skilled in the art will readily recognize that various changes and modifications can be made therein without