**Supplementary Methods**

**Inclusion and exclusion criteria for enrollment of patients**

The inclusion criteria for enrollment of patients were as follows: age of more than 20 years; an Eastern Cooperative Oncology Group (ECOG) performance status of 0 or 1; positive status for HLA-A2, -A3, -A11, -A24, -A26, -A31, or -A33; life expectancy of at least 12 weeks; adequate hematologic, renal, and hepatic function (white blood cells >2,500/µl, lymphocytes >1,000/µl, platelets >80,000/µl, serumcreatinine <1.5 mg/dl, and total bilirubin <2.5 mg/dl). Exclusion criteria included pulmonary, cardiac, or other systemic diseases; acute infection; a history of severe allergic reactions; pregnancy or nursing; or other inappropriate conditions for enrollment as judged by clinicians.

**Measurement of humoral and cellular immune responses**

The humoral immune responses specific to the vaccine peptides were determined by peptide-specific IgG titers using a bead-based multiplex assay with the Luminex 200 system (Luminex, Austin, TX). In brief, plasma from patients before and after vaccination was incubated with 100 µL of peptide-coupled color-coded beads for 1.5 hours at 30°C. After washing, the beads were incubated with 100 µL of biotinylated goat anti-human IgG Ab (gamma chain-specific; Vector Laboratories, Burlingame, CA) for 1 hour at 30°C. After washing, the beads were incubated with 100 µL of streptavidin-PE (Life Technologies, Carlsbad, CA) for 30 min at 30°C, followed by washing and detection of fluorescence intensity unit (FIU) on the beads using the Luminex 200 system.

CTL responses specific to the vaccine peptides were evaluated by interferon (IFN)- ELISPOT assay. After thawing, PBMCs (1 × 105 cells/well) were incubated in 96-well microculture plates (IWAKI, Tokyo, Japan) with 100 µL of medium (OpTmizer™ T Cell Expansion SFM; Life Technologies, Carlsbad, CA) containing 10% FBS (MP Biologicals, Solon, OH), 1% L-glutamine (Life Technologies), IL-2 (20 IU/mL; AbD serotec, Kidlington, UK), and mixture of vaccinated peptides (20 µg/ml) for 6 days. The cultured cells were harvested and tested for their ability to produce IFN- in response to either the corresponding peptides or negative control peptides from human immunodeficiency virus (HIV). The cells (5 X 104 cells/well) were cultured in triplicate for 18 hours at 37°C with the C1R cells transfected with each type of HLA (1 X 104 cells/well) loaded with specific or control peptides (10 µg/ml) in 96-well ELISPOT plate (MultiScreen HTS, Millipore) coated with anti-human IFN-Ab (MABTECH, Cincinnati, OH). After washing, the spots were developed with biotin-conjugated anti-human IFN- Ab (MABTECH), streptavidin-ALP (MABTECH), and BCIP/NBT substrate (Sigma-Aldrich, St. Louis, MO), and then counted by ELISPOT reader (ImmunoSpot S5 Versa Analyzer; Cellular Technology Ltd, Shaker Heights, OH). When the spot numbers in response to the specific peptides were significantly higher (P < 0.05 by Student’s t-test) than those in response to the control peptides, antigen-specific CTL responses were shown as the differences between them (means of the triplicate samples).