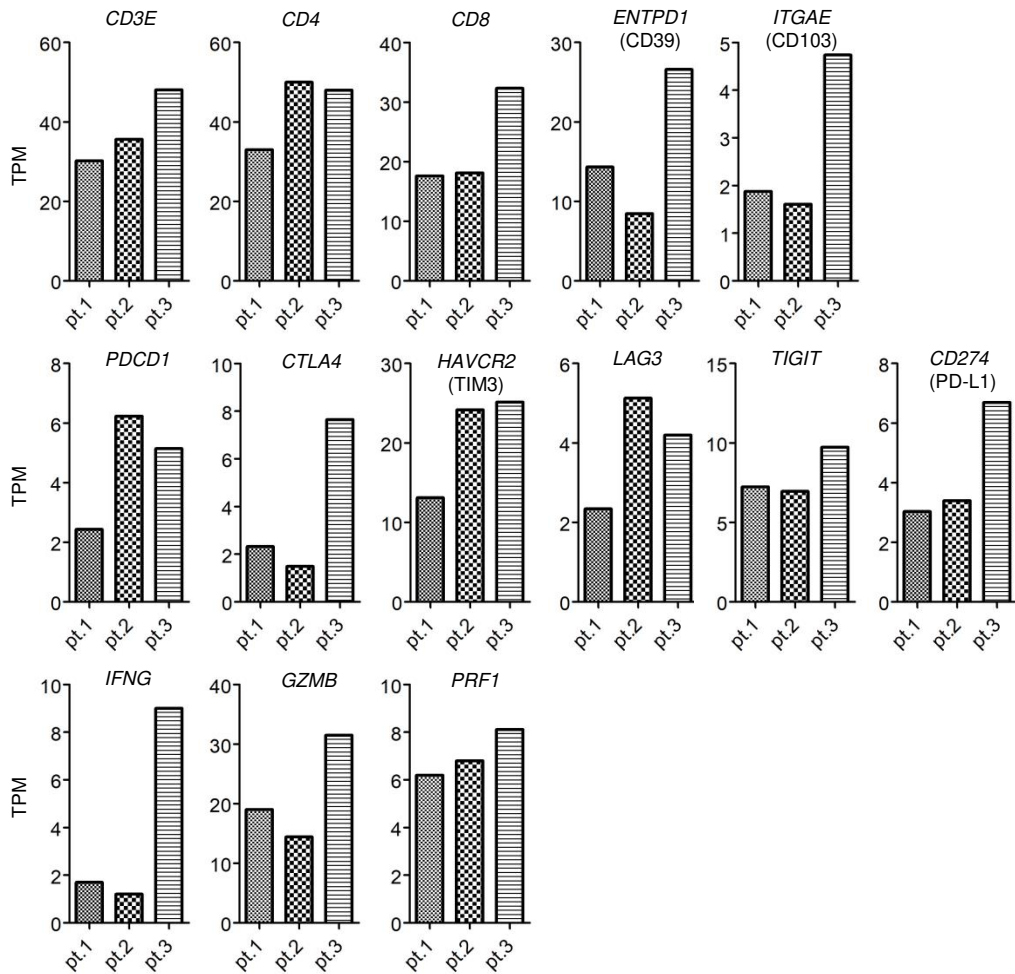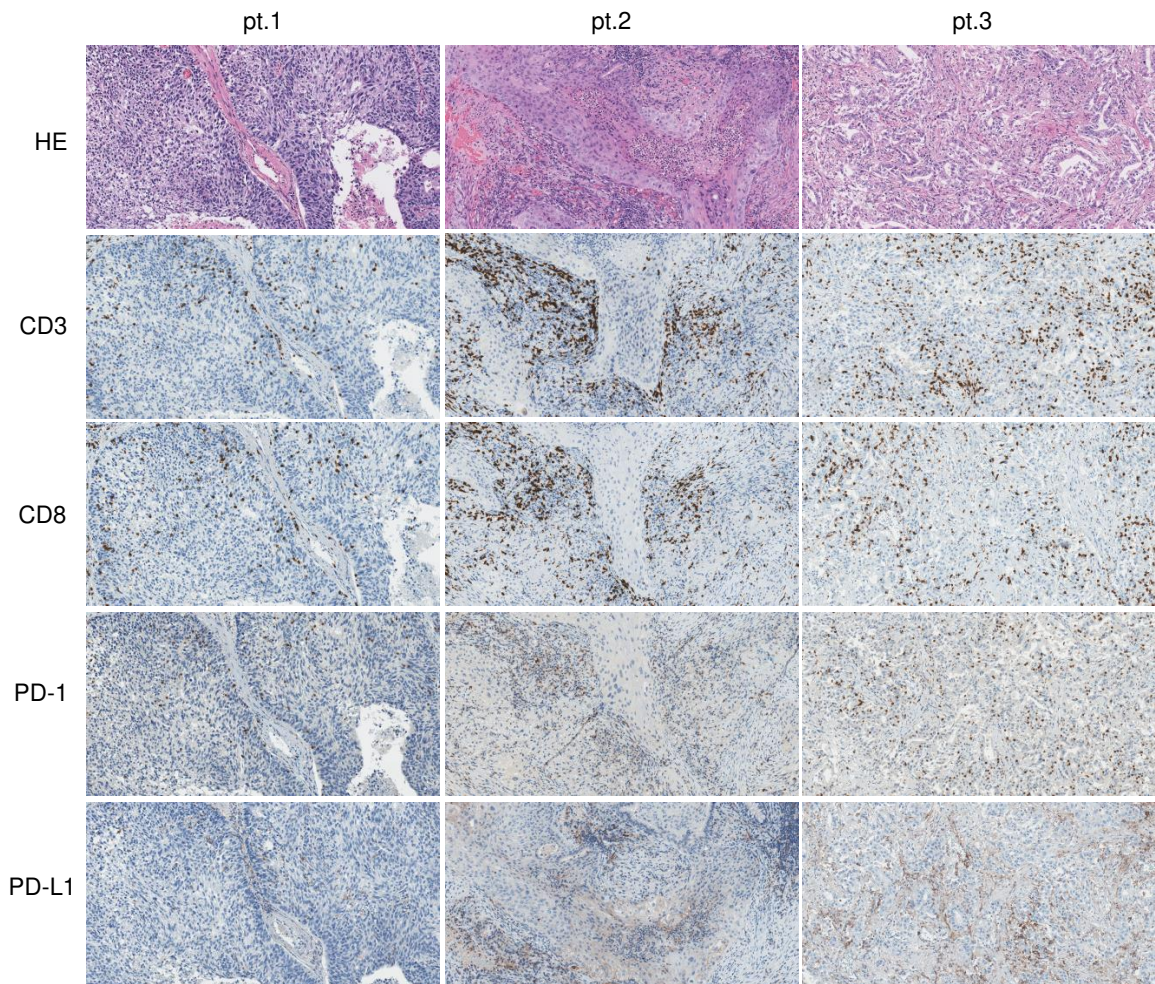## Supplementary Fig. S1

Supplementary Fig. S1. Analysis of immune-related gene expression profiles in three lung cancer patients.
Immune cell marker, immune checkpoint molecule, and effector molecule gene expression (TPM) are compared among three patients (pt.1, pt.2 and pt.3).

Supplemental material

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Supplementary Fig. S2


Supplementary Fig. S2. Immunohistochemistry (IHC).
Expression of immune cell markers (CD3 and CD8) and immune checkpoint molecules (PD-1 and PD-L1) are examined by IHC in three patients (pt.1, pt.2 and pt.3).

Supplementary Fig. S3
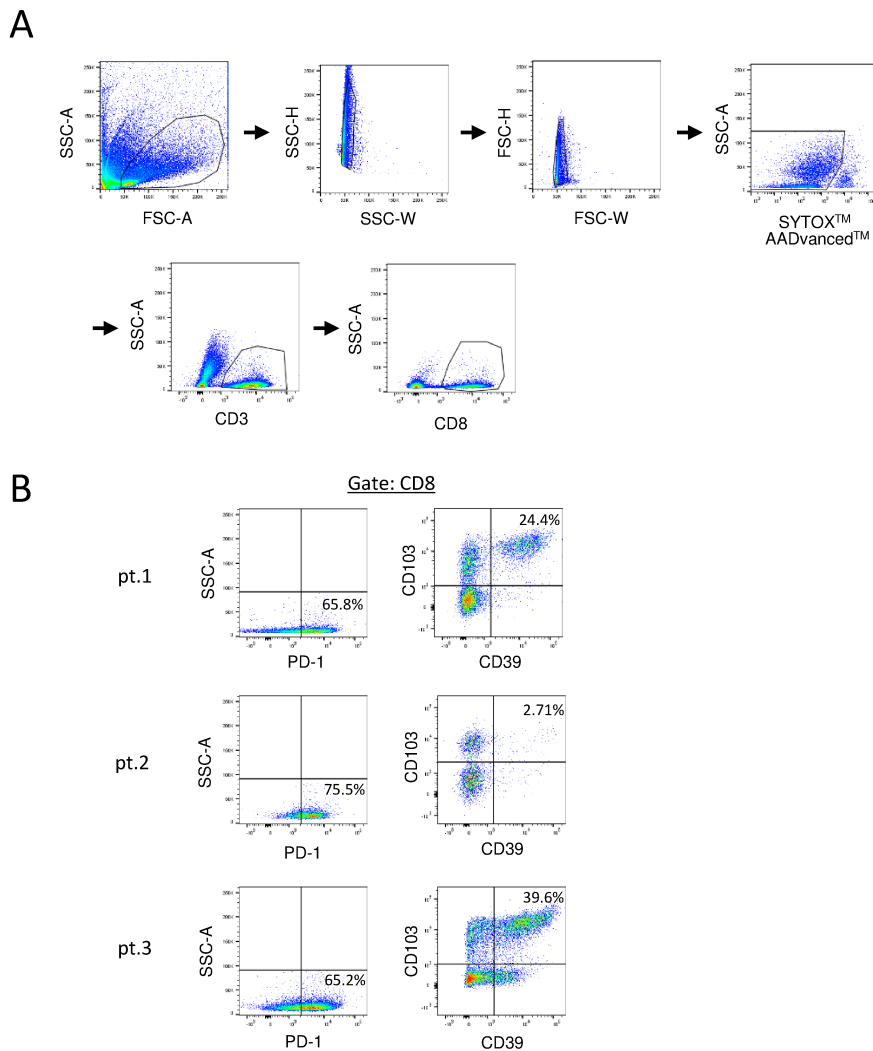
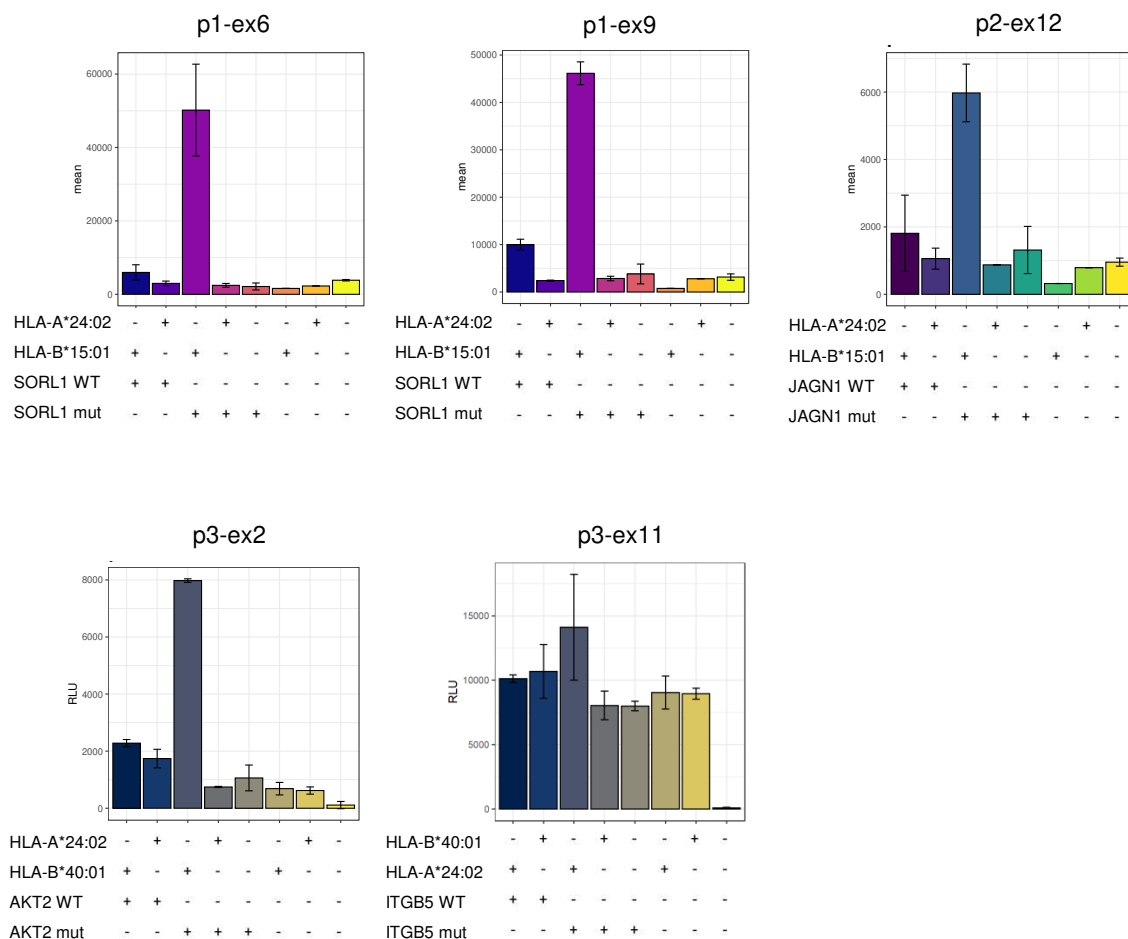**Supplementary Fig. S3. Flow cytometry gating strategy and CD8+ T cell staining.**
A, The gating strategy is shown including initial gates (SSC singlet, FSC singlet, and live cells) followed by CD3+ and CD8+ cells. B, PD-1+CD8+ T cells and CD39+CD103+CD8+ T cells in each patient are shown.

Supplementary Fig. S4
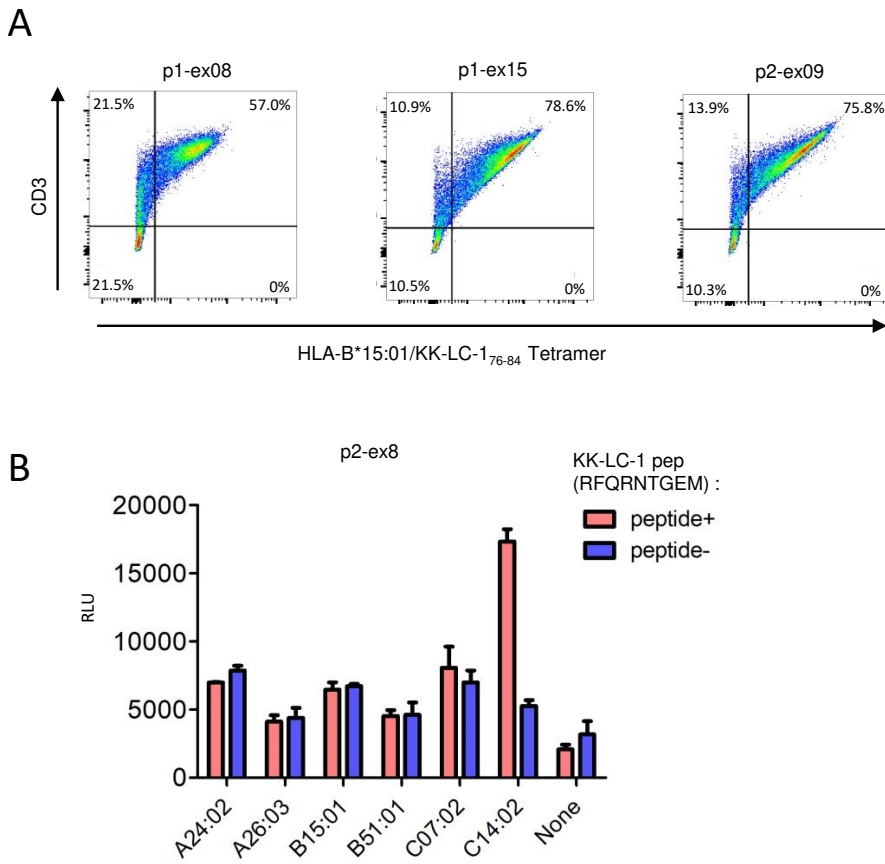
Supplementary Fig. S4. Tetramer staining and luciferase assay.
A, The TCR-transduced Jurkat cells (Jurkat-TCR cells) are stained with anti-CD3 antibody and HLA-B*15:01/KK-LC-1$_{76-84}$ Tetramer. **B**, HEK293T cells transduced with HLA genes in the presence or absence of antigenic peptides (10μg/ml) were cocultured with Jurkat-TCRs-Luc cells and activation of the NFAT gene was measured by the Steady-Glo Luciferase Assay System.

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Supplementary Fig. S5

Supplementary Fig. S5. Recognition of naturally processed peptides by Jurkat cells stably expressing TCRs (stable Jurkat-TCR cells).
HEK293T cells were transfected with expression vectors harboring HLA genes and antigen genes with or without mutations. Post transfection, the HEK293T cells were plated with stable Jurkat-TCR cells transduced with the pGL4.30 [luc2P/NFAT-RE/Hygro] vector. After overnight incubation, activation of the NFAT gene was measured by the Steady-Glo Luciferase Assay System.

Supplementary Fig. S6
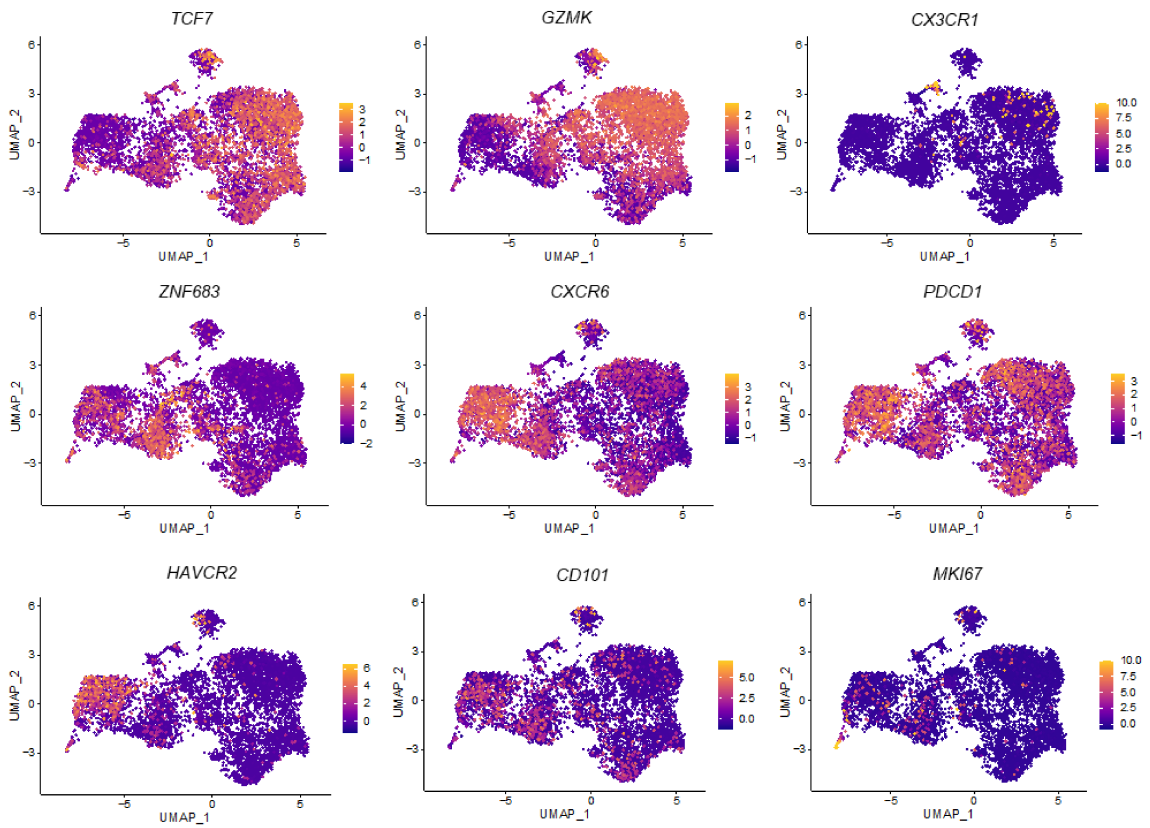
Supplementary Fig. S6. UMAPs of the distribution of differentiation marker genes.
Log-normalized gene expression of *TCF7*, *GZMK*, *CX3CR1*, *ZNF683*, *CXCR6*, *PDCD1*, *HAVCR2*, *CD101*, and *MKI67* in a total 6,998 T cells from three patients were shown.