ACCSCIENCE PUBLISHING

Eurasian Journal of Medicine and Oncology

ORIGINAL RESEARCH ARTICLE

Characteristics of T-cell and B-cell receptor repertoires in patients with autoimmune hepatitis

Supplementary File

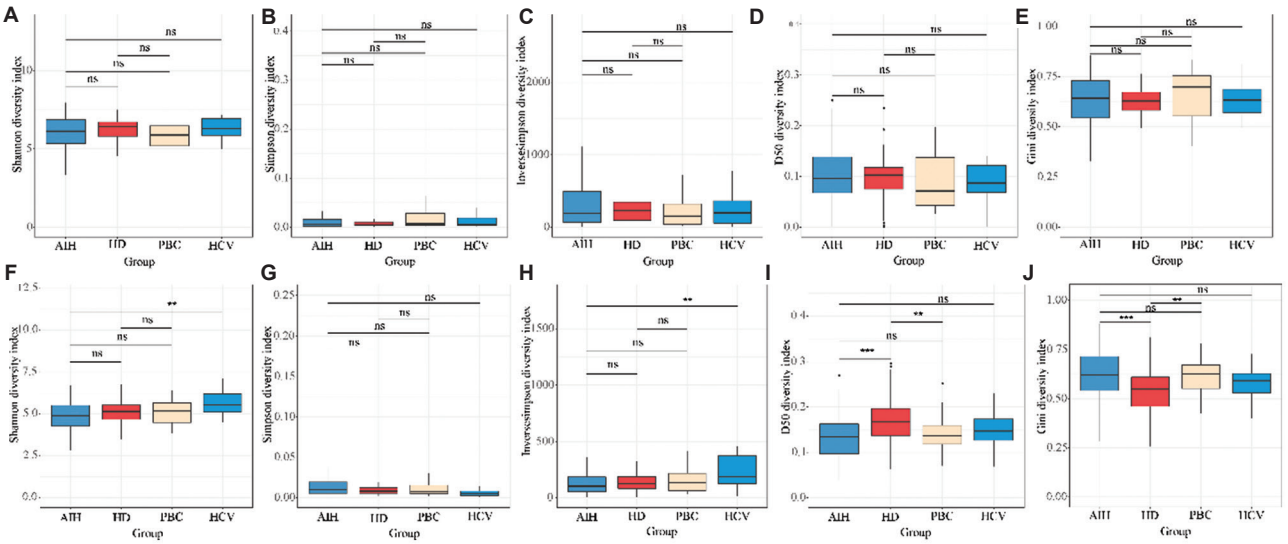


Figure S1. Out-of-frame TCR-β and BCR-H repertoire diversity indices in the peripheral blood of AIH patients and control groups (HD, PBC, and HCV). The diversity of the TCR-β repertoire was assessed using (A) Shannon index, (B) Simpson index, (C) inverse Simpson index, (D) D50 diversity index, and (E) Gini diversity index. The BCR-H CDR3 repertoire diversity was measured using (F) Shannon index, (G) Simpson index, (H) inverse Simpson index, (I) D50 diversity index, and (J) Gini diversity index. Data were compared using an unpaired *t*-test, and multiple comparisons were adjusted using the Bonferroni-Holm correction. Single asterisk (*) and double asterisk (**) indicate statistical significance at $p < 0.05$ and $p < 0.01$, respectively. "ns" denotes no statistical significance.

Abbreviations: AIH: Autoimmune hepatitis; BCR: B-cell receptor; HCV: Hepatitis C virus; HD: Healthy donor; PBC: Primary biliary cholangitis; TCR: T-cell receptor.

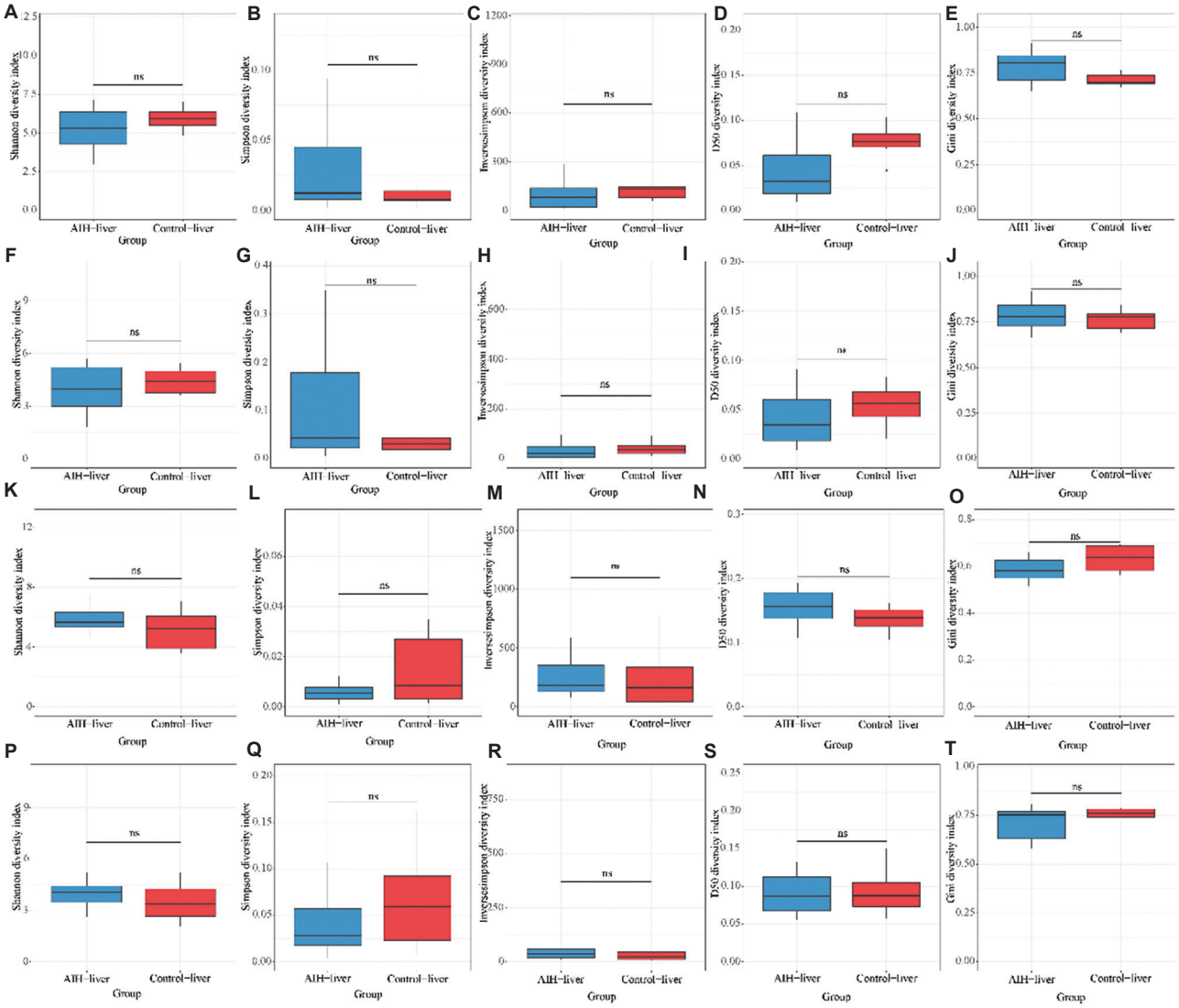


Figure S2. Diversity indices of TCR-β and BCR-H CDR3 repertoire in liver tissue samples from AIH patients and control groups. The diversity of the in-frame TCR repertoire was measured using (A) Shannon index, (B) Simpson index, (C) inverse Simpson index, (D) D50 diversity index, and (E) Gini diversity index. The diversity of the out-of-frame TCR repertoire was measured using (F) Shannon index, (G) Simpson index, (H) inverse Simpson index, (I) D50 diversity index, and (J) Gini diversity index. The diversity of the in-frame BCR repertoire was measured using (K) Shannon index, (L) Simpson index, (M) inverse Simpson index, (N) D50 diversity index, and (O) Gini diversity index. The diversity of the out-frame BCR repertoire was measured using (P) Shannon index, (Q) Simpson index, (R) inverse Simpson index, (S) D50 diversity index, and (T) Gini diversity index. Data were compared using an unpaired *t*-test, and multiple comparisons were adjusted using the Bonferroni-Holm correction. "ns" denotes no statistical significance.

Abbreviations: AIH: Autoimmune hepatitis; BCR: B-cell receptor; HCV: Hepatitis C virus; HD: Healthy donor; PBC: Primary biliary cholangitis; TCR: T-cell receptor.

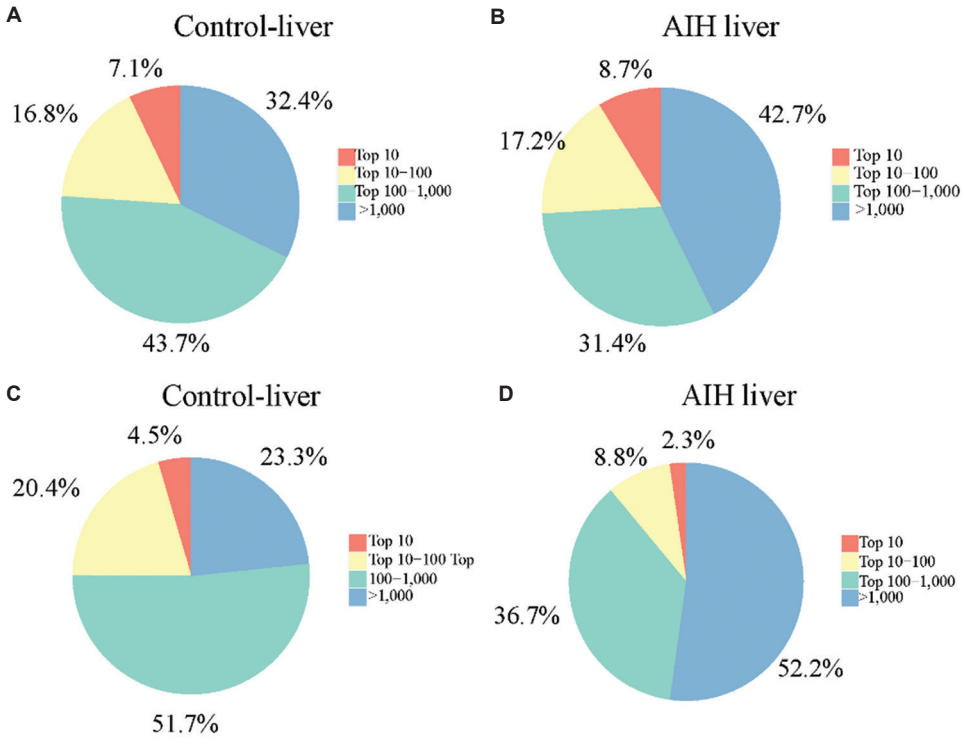


Figure S3. Analysis of TCR-β and BCR-H CDR3 repertoires in liver tissue samples from AIH and control groups. Frequency distributions of TCR-β repertoires in liver tissue samples from (A) control and (B) AIH groups. Frequency distributions of BCR-H repertoires in liver tissue samples from (C) control and (D) AIH groups. Each pie chart displays the percentages of the most prevalent clones, classified into four categories: Top 10, the top 11–100, the top 101–1,000, and those over 1,000.

Abbreviations: AIH: Autoimmune hepatitis; BCR-H: B-cell receptor heavy chains; CDR3: Complementarity-determining region 3; HCV: Hepatitis C virus; HD: Healthy donor; PBC: Primary biliary cholangitis; TCR-β: T-cell receptor β-chains.

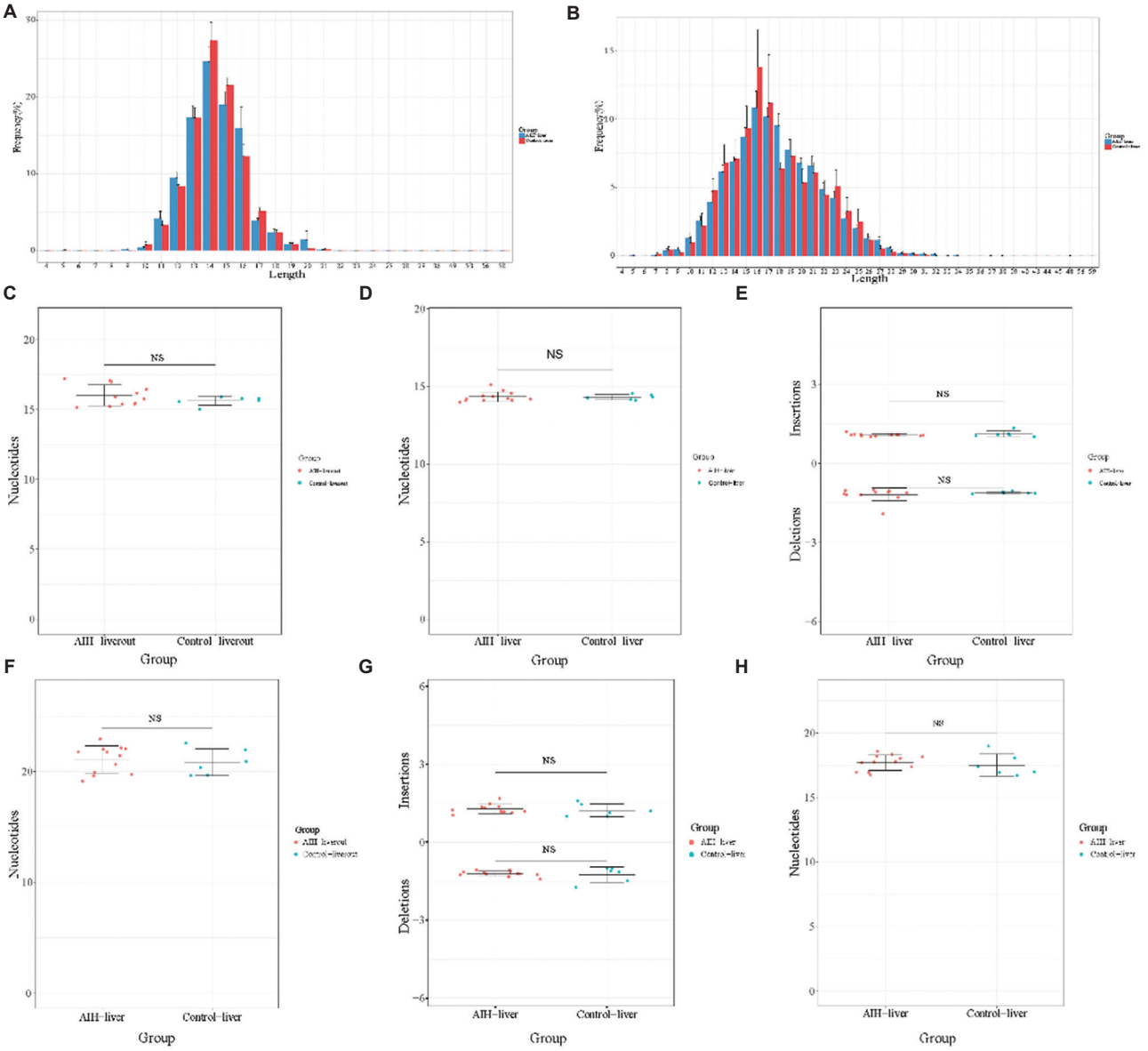


Figure S4. Distribution of lengths and recombination patterns of TCR-β and BCR-H CDR3 in liver tissue samples from AIH and control groups. Amino acid lengths of (A) TCR-β CDR3 and (B) BCR-H CDR3 in AIH and control groups. Nucleotide lengths of the (C) out-of-frame and (D) in-frame TCR-β repertoires across groups, along with (E) the average length of nucleotide insertions or deletions in TCR-β CDR3. Similarly, nucleotide lengths of the (F) out-of-frame and (G) in-frame BCR-H repertoires in the AIH cohort, along with (H) the average length of nucleotide insertions or deletions in BCR-H CDR3. Nucleotide length comparisons between the (F) out-of-frame and (G) in-frame BCR-H repertoires among AIH patients and control patients, along with (H) the average length of BCR-H CDR3 nucleotide insertions or deletions. Data are presented as mean ± standard deviation and compared using an unpaired *t*-test. "NS" denote no statistical significance.

Abbreviations: AIH: Autoimmune hepatitis; BCR-H: B-cell receptor heavy chain; CDR3: Complementarity-determining region 3; HCV: Hepatitis C virus; HD: Healthy donor; PBC: Primary biliary cholangitis; TCR-β: T-cell receptor β-chain.

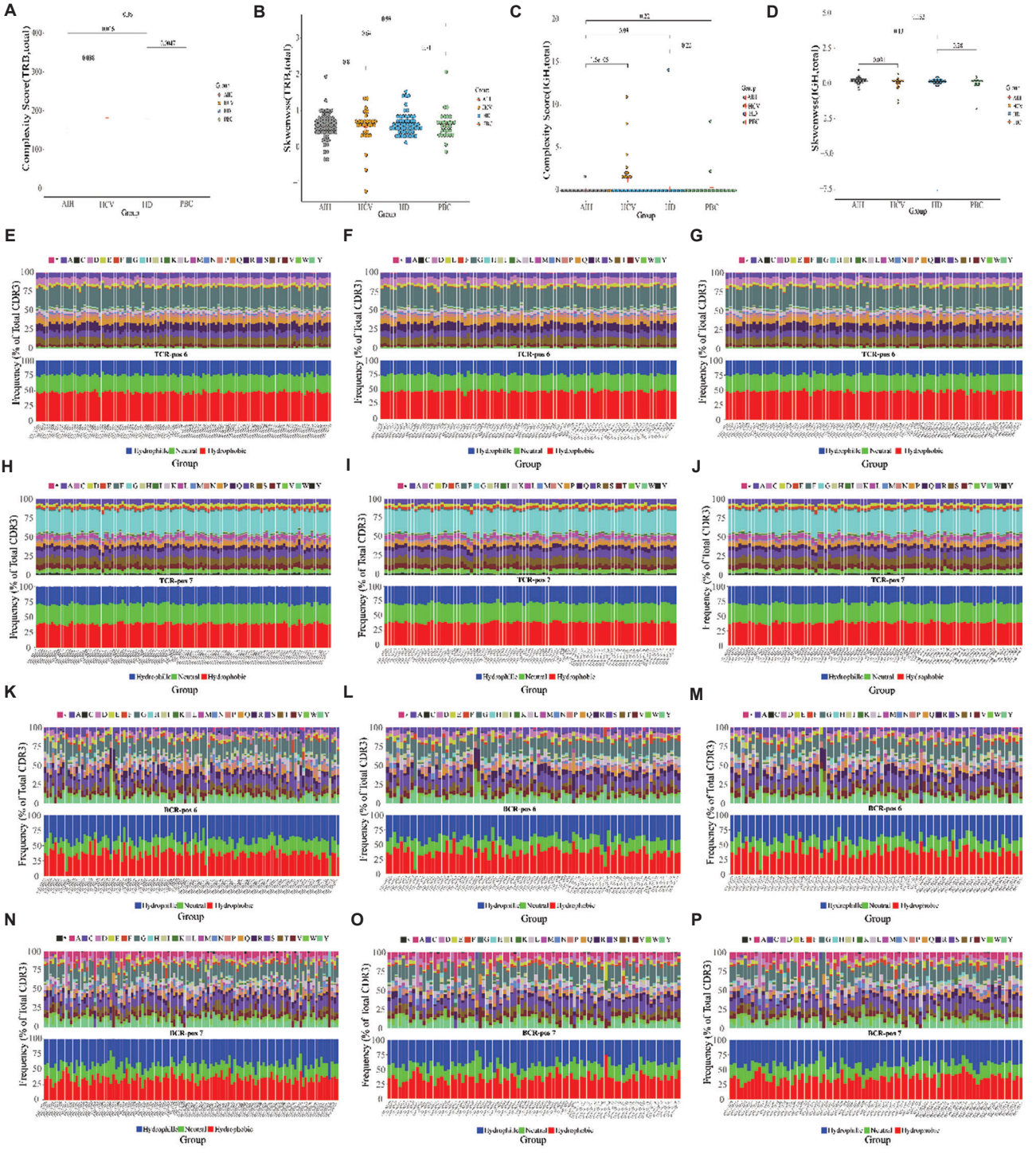


Figure S5. Analysis of CDR3 length and amino acid composition in PBMC samples from AIH patients. Complexity scores and skewness of total (A and B) TCR-β CDR3 and (C and D) BCR-H CDR3 sequences among AIH, HCV, PBC, and HD groups. Amino acid composition of the 13-amino acid-long TCR-β CDR3: (E-G) Composition at position 6 in AIH compared with (E) HD, (F) HCV, and (G) PBC groups; (H-J) Composition at position 7 in AIH compared with (H) HD, (I) HCV, and (J) PBC groups. Amino acid composition of the 13-amino acid-long BCR-H CDR3: (K-M) Composition at position 6 in AIH compared with (K) HD, (L) HCV, and (M) PBC groups; (N-P) Composition at position 7 in AIH compared with (N) HD, (O) HCV, and (P) PBC groups. Abbreviations: AIH: Autoimmune hepatitis; BCR-H: B-cell receptor heavy chain; CDR3: Complementarity-determining region 3; HCV: Hepatitis C virus; HD: Healthy donor; IGH: Immunoglobulin heavy; PBC: Primary biliary cholangitis; TCR-β: T-cell receptor β-chain; TRB: T-cell receptor β variable region.

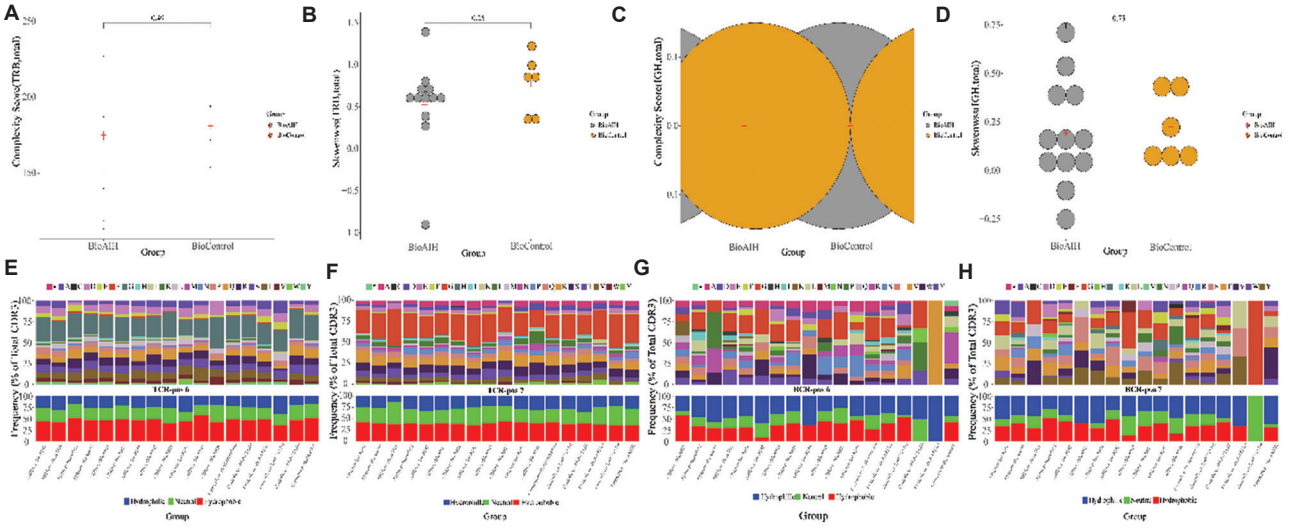


Figure S6. Analysis of CDR3 length and amino acid composition in liver tissue samples from AIH patients. Complexity scores and skewness of total (A) TCR-β CDR3 and (B) BCR-H CDR3 sequences in liver tissue samples from AIH and control groups. (C) and (D) represent the complexity and skewness scores of BCR-H in AIH and normal control liver tissues. Amino acid composition of the 13-amino acid-long (E) TCR-β CDR3 and (G) BCR-H CDR3 at position 6 in AIH and control groups. Amino acid composition of the 13-amino acid-long (F) TCR-β CDR3 and (H) BCR-H CDR3 at position 7 in AIH and control groups.

Abbreviations: AIH: Autoimmune hepatitis; BCR-H: B-cell receptor heavy chain; CDR3: Complementarity-determining region 3; IGH: Immunoglobulin heavy; TCR-β: T-cell receptor β-chain; TRB: T-cell receptor β variable region.

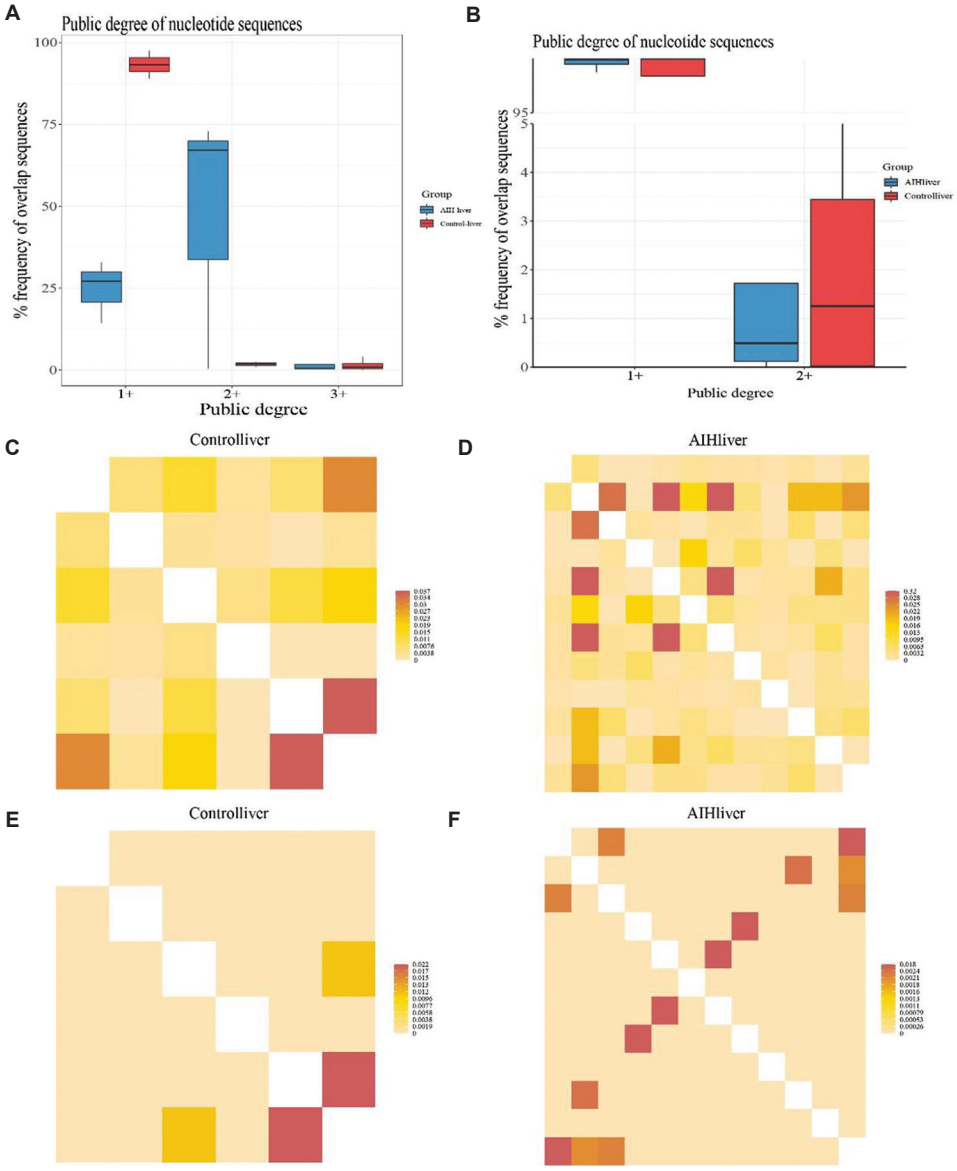


Figure S7. Clone sharing within the AIH cohort. Overlap of (A) TCR-β CDR3 and (B) BCR-H CDR3 amino acid sequences between liver tissue samples from AIH and control groups. (C-F) Heatmaps showing the percentage of shared repertoire between any two individuals: (C) TCR-β CDR3 in the control group; (D) TCR-β CDR3 in the AIH group; (E) BCR-H CDR3 in the control group; and (F) BCR-H CDR3 in the AIH group.
Abbreviations: AIH: Autoimmune hepatitis; BCR-H: B-cell receptor heavy chain; CDR3: Complementarity-determining region 3; TCR-β: T-cell receptor β-chain.