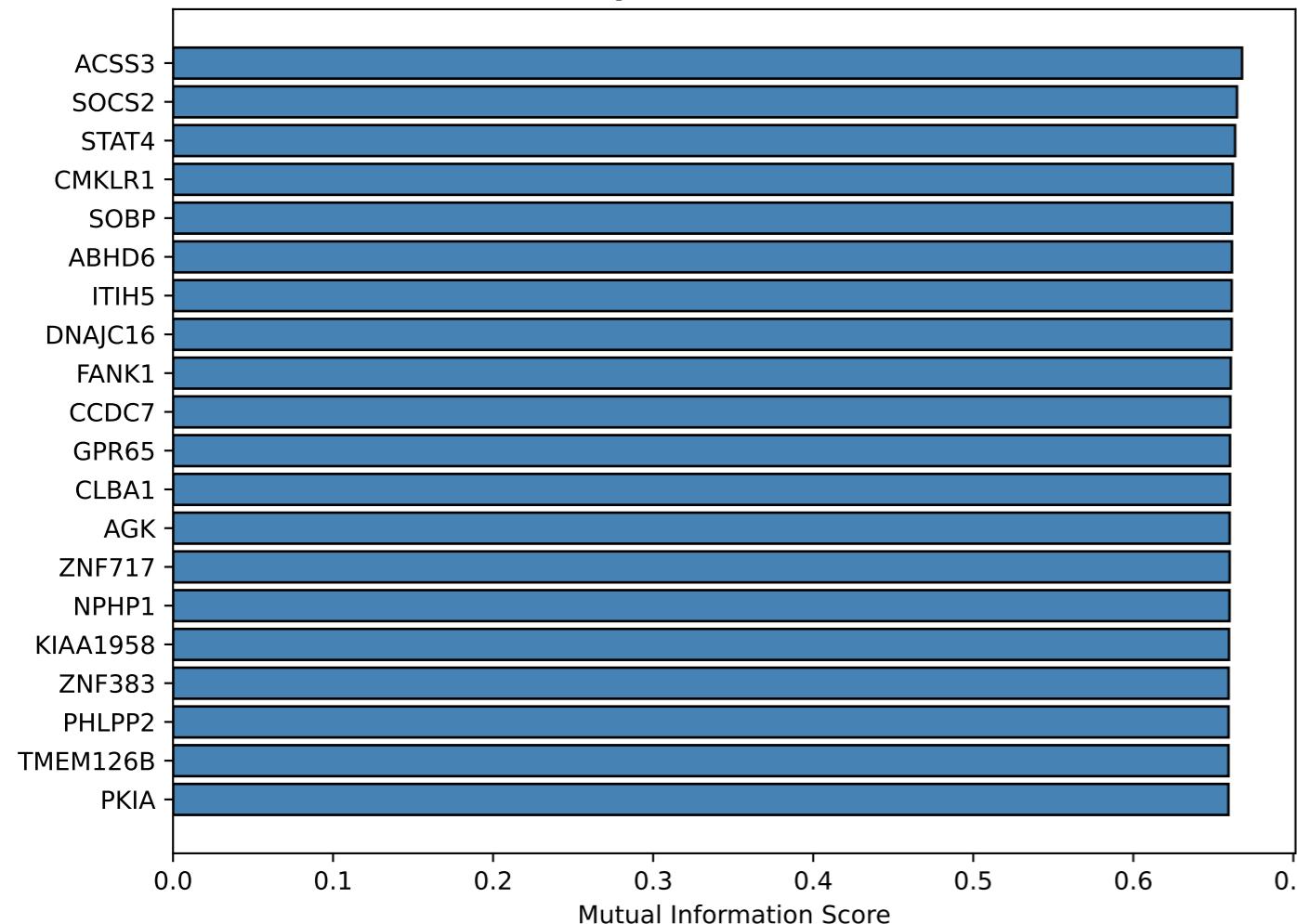


## Figure 8: Mutual Information-Based Biomarker Discovery

### A) Top 20 MI Biomarkers



#### MUTUAL INFORMATION BIOMARKERS

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Method: Calculated MI between gene expression and treatment response (R/NR) across all cells.

#### Top Biomarker Candidates:

- ACSS3 - Acetyl-CoA metabolism
- SOCS2 - Cytokine signaling suppressor
- STAT4 - T cell differentiation
- CMKLR1 - Chemokine receptor

These genes show non-linear relationships with treatment response that may not be captured by standard DE analysis.

#### Biological Relevance:

Many top MI genes are immune regulators, suggesting immune microenvironment differences between R and NR.

#### Next Steps:

- Validate in independent cohorts
- Investigate functional roles
- Consider as therapeutic targets