Study Cohort Study Population: 406 Chinese adults with biopsy-proven MASLD Genotyping: TF-rs1049296 CC: 50.2% TF-rs1049296 CT/TT: 49.8% Iron Deposition Patterns (n=271, 66.7%): Hepatocellular (HC): 16.6% RES: 26.9%

Mixed: 56.5%

Core Finding Conclusion **Specificity Note: Significant Interaction:** Pinteraction = 0.035No significant association with other iron deposition patterns **High-Risk Profile:** TF-rs1049296 CT/TT + RES Association particularly enhanced iron deposition in male patients Fibrosis Risk: The TF-rs1049296 T allele and Adjusted OR = 6.65 (95% CI: RES iron deposition interact to 1.84-23.97) identify a MASLD subpopulation

at substantially elevated risk for

progressive liver fibrosis.