Title: A Novel highly thermostable branched-chain amino acid aminotransferase from the crenarchaeon *Vulcanisaeta moutnovskia* 768-28

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Highlights

- A novel archaeal BCAT was expressed in *E. coli*, purified and characterized.
- Enzyme showed a broad spectrum and unique combination of substrate specificities.
- VMUT0738 showed high *(S)*-enantioselectivity, thermostability, resistance to solvents.
- Two sequence motifs characteristic of BCATs from *Thermoproteaceae* were revealed.