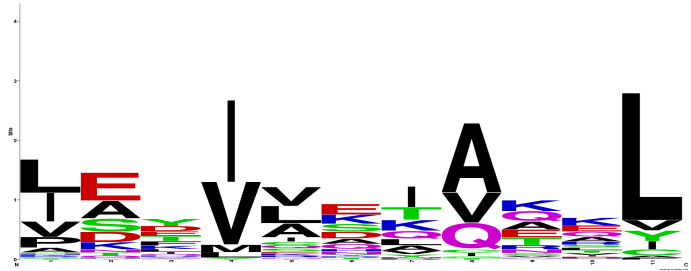


**I63**

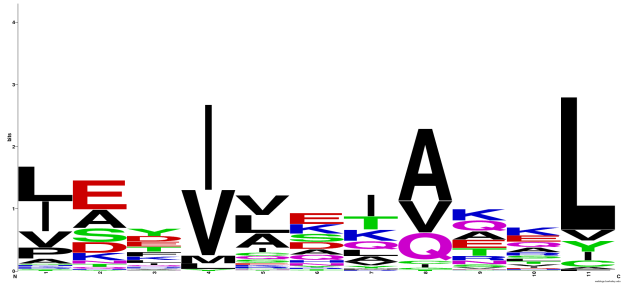


Bits

2

4

**L73**



Bits

2

4

**R207**



Bits

2

4



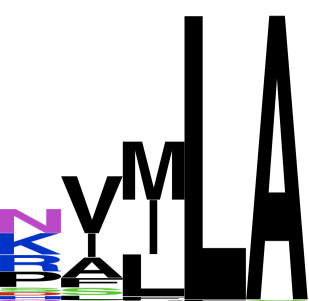
**M219**

Bits

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4

**N148**

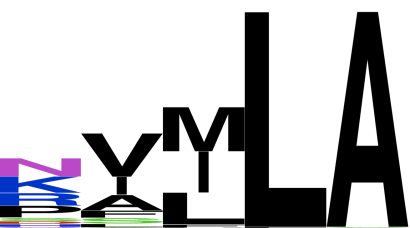


Bits

2

4

**A152**



Bits

2

4

**A93**



Bits

2

4

**N96**



Bits

2

4

TrpF

MetR

**a)**

**b)**

TrpF

MetR

TrpF

MetR

TrpF

MetR

**Figure S3**. **Sequence analysis found at variable positions in natural TrpF and MetR enzymes**. The natural sequence diversity found at variable positions of β-strand and α-helix elements in the wild-type enzymes is shown for α-helix 3 of TrpF and α-helix 7 of MetR in a) and for β-strand 7 of TrpF and β-strand 3 of MetR in b). Sequence distribution was obtained from the multiple sequence alignments constructed in figure S1. The three-dimensional structure of the *E. coli* enzyme (PDB: 1PII) was used to identify the variable positions. The amino acid numbering of TrpF is according to gene reported by Kirschner et al.