

$$\begin{array}{ccc}
 A \otimes (B \otimes I) & \xrightarrow{\alpha_{A,B,I}} & (A \otimes B) \otimes I \\
 \searrow 1_A \otimes \rho_B & & \swarrow \rho_{A \otimes B} \\
 & A \otimes B &
 \end{array}$$