

$$\begin{array}{ccc}
X \otimes^{\mathbf{L}} (Y \otimes^{\mathbf{L}} Z) & \xlongequal{\quad} & \rho X \otimes \rho(\rho Y \otimes \rho Z) \xrightarrow{1 \otimes c} \rho X \otimes (\rho Y \otimes \rho Z) \\
\downarrow \alpha^\rho & & \downarrow \alpha \\
(X \otimes^{\mathbf{L}} Y) \otimes^{\mathbf{L}} Z & \xlongequal{\quad} & \rho(\rho X \otimes \rho Y) \otimes \rho Z \xleftarrow{(c \otimes 1)^{-1}} (\rho X \otimes \rho Y) \otimes \rho Z
\end{array}$$