

$$\begin{array}{ccccc}
X \otimes^{\mathbf{L}} (Y \otimes^{\mathbf{L}} Z) & \xleftarrow{l_X} & \rho X \otimes (Y \otimes^{\mathbf{L}} Z) & \xleftarrow{\rho X \otimes r_Z} & \rho X \otimes (Y \otimes \rho Z) \\
\alpha^D \downarrow & & & & \downarrow \simeq \alpha \\
(X \otimes^{\mathbf{L}} Y) \otimes^{\mathbf{L}} Z & \xleftarrow{r_Z} & (X \otimes^{\mathbf{L}} Y) \otimes \rho Z & \xleftarrow{l_X \otimes \rho Z} & (\rho X \otimes Y) \otimes \rho Z
\end{array}$$