

$$\begin{array}{ccccccc}
& & \xrightarrow{A \otimes^{\mathbf{L}} (l_{A \otimes^{\mathbf{L}} X}^\rho)} & & & & \\
\rho A \otimes \rho(\rho A \otimes \rho X) & \longrightarrow & \rho A \otimes \rho(A \otimes \rho X) & \xlongequal{\quad} & \rho A \otimes \rho \rho X & \xrightarrow{1 \otimes c} & \rho A \otimes \rho X \\
\parallel & \searrow 1 \otimes c & & \searrow 1 \otimes c & & \nearrow \parallel & \parallel \\
A \otimes^{\mathbf{L}} (A \otimes^{\mathbf{L}} X) & & \rho A \otimes (\rho A \otimes \rho X) & \xrightarrow{1 \otimes (c \otimes 1)} & \rho A \otimes (A \otimes \rho X) & & A \otimes^{\mathbf{L}} X \\
\downarrow \alpha^\rho & \blacktriangle & \downarrow \alpha & & \downarrow \alpha & & \downarrow \parallel \\
(A \otimes^{\mathbf{L}} A) \otimes^{\mathbf{L}} X & & (\rho A \otimes \rho A) \otimes \rho X & \xrightarrow{(1 \otimes c) \otimes 1} & (\rho A \otimes A) \otimes \rho X & \star & A \otimes^{\mathbf{L}} X \\
\parallel & & & \nearrow c \otimes 1 & \parallel & & \parallel \\
\rho(\rho A \otimes \rho A) \otimes \rho X & \xrightarrow{c \otimes 1} & \rho(A \otimes \rho A) \otimes \rho X & \xrightarrow{c \otimes 1} & \rho \rho A \otimes \rho X & \xleftarrow{c \otimes 1} & \rho A \otimes \rho X \\
& \xrightarrow{(l_{A \otimes^{\mathbf{L}} A}^\rho) \otimes^{\mathbf{L}} X} & & & & & \\
& & & & & & 
\end{array}$$