$$X \otimes^{\mathbf{L}} (Y \otimes^{\mathbf{L}} Z) =\!=\!=\!= \rho(\rho X \otimes \rho(\rho Y \otimes \rho Z))$$

$$\downarrow^{\alpha^\rho} \qquad\qquad\qquad\qquad \downarrow^{\rho(\alpha^c)}$$

$$(X \otimes^{\mathbf{L}} Y) \otimes^{\mathbf{L}} Z =\!=\!=\!= \rho(\rho(\rho X \otimes \rho Y) \otimes \rho Z)$$