

$$\begin{array}{ccc}
 \mathrm{Hom}_{\mathcal{D}}(F(C), D) & \longrightarrow & \mathrm{Hom}_{\mathcal{C}}(C, G(D)) \\
 \uparrow g \circ (-) \circ F(f) & & \uparrow G(g) \circ (-) \circ f \\
 \mathrm{Hom}_{\mathcal{D}}(F(C'), D') & \longrightarrow & \mathrm{Hom}_{\mathcal{C}}(C', G(D'))
 \end{array}$$