

$$\begin{array}{ccc}
 \mathrm{Hom}_{\mathcal{D}}(R, R) & \xrightarrow{\sim} & \mathrm{Hom}_{\mathcal{C}}(D, F(R)) \\
 \downarrow f \circ (-) & & \downarrow F(f) \circ (-) \\
 \mathrm{Hom}_{\mathcal{D}}(R, C) & \xrightarrow{\sim} & \mathrm{Hom}_{\mathcal{C}}(D, F(C))
 \end{array}$$

$$\begin{array}{ccccc}
 1_R & \longmapsto & u : D & \longrightarrow & F(R) \\
 \downarrow & & & & \downarrow \\
 f : R & \longrightarrow & C & \longmapsto & \varphi(f) = F(f) \circ u
 \end{array}$$