

$$\begin{array}{ccc}
 \mathbf{C}_1 & \xrightarrow[\text{MonCat}]{f_1} & \mathbf{D}_1 \\
 \downarrow F & \text{MonCaMonCat} & \uparrow G \\
 \mathbf{C}_2 & \xrightarrow[\text{MonCat}]{f_2} & \mathbf{D}_2 \\
 \downarrow H & \text{MonCaMonCat} & \uparrow I \\
 \mathbf{C}_3 & \xrightarrow[\text{MonCat}]{f_3} & \mathbf{D}_3
 \end{array}$$

$$\begin{array}{ccc}
 \mathbf{C}_1 & \xrightarrow[\text{MonCat}]{f_1} & \mathbf{D}_1 \\
 \downarrow F \circ H & \text{MonCaMonCat} & \uparrow I \circ G \\
 \mathbf{C}_3 & \xrightarrow[\text{MonCat}]{f_3} & \mathbf{D}_3
 \end{array}$$