

$$\begin{array}{ccccc}
& & \mathbf{add}(R) & & (\mathbf{mod}_R)^{\mathrm{op}} & & (\mathrm{cok}(f)_R, -)_R \\
& & \downarrow & & \uparrow & & \uparrow \\
- \otimes_R R^m & & {}_R R^m & & R_R^m & & (R_R^m, -)_R \\
\downarrow f! & + \lim_{\rightarrow}^{<\infty} & \downarrow f & & \uparrow f^{\mathrm{op}} & + \lim_{\rightarrow}^{<\infty} & \uparrow f^* \\
- \otimes_R R^n & & {}_R R^n & & R_R^n & & (R_R^n, -)_R \\
\downarrow & & & & & & \\
- \otimes_R \mathrm{cok}(f) & & \mathbf{mod}_{R^{\mathrm{op}}} & & \mathbf{add}(R) & &
\end{array}$$