ABSTRACT. We consider generalizations to monoidal categories of the tensor-hom relationship for modules over a commutative ring $R$, i.e., $- \otimes_R M$ is left adjoint to $\text{Hom}_R(M,-)$ as endofunctors of $R$-Mod. For an object $V$ of a symmetric monoidal category $(\mathcal{V}, \otimes, I, \ldots)$, one can ask whether the endofunctor $- \otimes V$ has a right adjoint. If this is the case, for all $V$, then $\mathcal{V}$ is called a symmetric monoidal closed category. There are many examples of symmetric monoidal closed categories. The existence of left adjoints to $- \otimes V$ is less common in many familiar monoidal categories. We say $V$ is exact when such an adjoint exists. For example, in the case of $R$-Mod, one can show that $M$ is exact if and only if $M$ is finitely generated and projective. The exact commutative $R$-algebras are precisely those which are exact when considered as $R$-modules. Our interest in the latter goes back to the late 1970s when we were considering the dual problem for the category of affine schemes over $\text{Spec} R$.

In this talk, we present a generalization of the above characterization of exact $R$-algebras which applies to several other categories.