When are $\mathcal{X}$-periodic modules trivial?

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Abstract: Let R be a ring and $\mathcal{X}$ a class of right R-modules closed under finite direct sums. A right R-module M is said to be $\mathcal{X}$-periodic (resp. pure $\mathcal{X}$-periodic) if there exists an exact sequence (resp. a pure exact sequence) $0 \to M \to X \to M \to 0$ with $X \in \mathcal{X}$. Obviously, each module in $\mathcal{X}$ is $\mathcal{X}$-periodic; we call these periodic modules trivial. The main objective of this talk is to study when $\mathcal{X}$-periodic modules are trivial. As an application of the results we will get some consequences in the category $\mathrm{Ch}(R)$ of unbounded chain complexes of modules.

The talk is based on joint work with S. Bazzoni and S. Estrada.