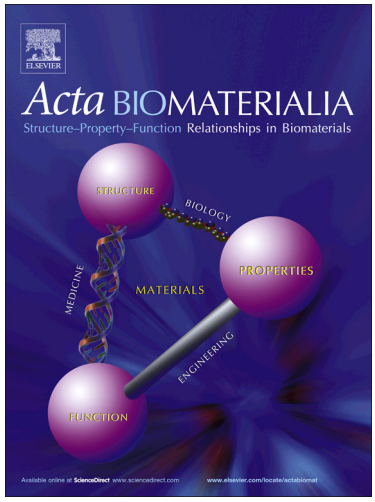

Review article

Zinc-based alloys for degradable vascular stent applications

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Zinc-based alloys for degradable vascular stent applications

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Abstract

The search for biodegradable metals with mechanical properties equal or higher to those of currently used permanent biomaterials, such as stainless steels, cobalt chromium and titanium alloys, desirable in vivo degradation rate and uniform corrosion is still an open challenge. Magnesium (Mg), iron (Fe) and zinc (Zn)-based alloys have been proposed as biodegradable metals for medical applications. Over the last two decades, extensive research has been done on Mg and Fe. Fe-based alloys show appropriate mechanical properties, but their degradation rate is an order of magnitude below the benchmark value. In comparison, alongside the insufficient mechanical performance of most of its alloys, Mg degradation rate has proven to be too high in a physiological environment and corrosion is rarely uniform. During the last few years, Zn alloys have been explored by the biomedical community as potential materials for bioabsorbable vascular stents due to their tolerable corrosion rates and tunable mechanical properties. This review summarizes recent progress made in developing Zn alloys for vascular stenting application. Novel Zn alloys are discussed regarding their microstructural characteristics, mechanical properties, corrosion behavior and *in vivo* performance.

Keywords: Bioabsorbable, Zinc alloys, Microstructure, Mechanical properties, Degradation

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