

Chapter 7

Perspective

The advance in tissue engineering has demanded biomaterials to exhibit bio-functional capability. The future direction for metallic implants goes toward the combination of the superior mechanical property of metals and the excellent bio-functionality of ceramics and polymers. A future for metallic biomaterials may include their revolutionary use for biodegradable implants. The study of innovative biodegradable metals is one of the most interesting research topics at the forefront of biomaterials in present days.

Introduced in 2001 when pure iron was used to make stent prototype and tested in rabbits, biodegradable metals have attracted interest of biomaterialists. Hundred studies have been published till the most significant clinical study of absorbable magnesium stents for treatment of critical limb ischemia in 2009. However, a significant breakthrough has never been reported. It has been ten years of development but there is still lack of knowledge which prevented the clinical use of this emerging technology.

There are at least two questions remain unexplained very well in biodegradable metals, namely: (1) the interaction between metal and its degradation product with the surrounding implantation site, and (2) in vivo degradation mechanism and its kinetics.

Very recently, a workshop on the state of the art of biodegradable metals was held in the FDA's Silver Spring office on 30th March 2012 attended by 120 participants. The aim of the workshop was to bring the current knowledge in this field and to discuss the current view of the FDA on this emerging technology. The workshop came out with an initiative to form a standardization committee on biodegradable metals for medical use. This may indicate a future for the applications of biodegradable metals in the medical field.