

**Title:**

Challenges in the use of Fe-based materials for bone scaffolds applications: Perspective from in vivo biocorrosion(Review)

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**Authors:**

Ahmed Al Sakkaf,  
Fatihhi Szali Januddi, [mohdalfatihhi@unikl.edu.my](mailto:mohdalfatihhi@unikl.edu.my)  
Abdul Hakim Md Yusop,  
Hadi Nur,

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**Abstract:**

Iron (Fe)-based implants have been intensively studied in the last few years offering high initial mechanical properties and good ductility, formability, and fatigue strength. Nevertheless, its potential as an alternative for a temporary medical implant could be hampered since its biocorrosion rate is still considered excessively slow both in vitro and in vivo which is not congruent with tissue healing time. The multicellular environments that associate with complex systemic interactions and involving mass transfer around the Fe implants in vivo inevitably exaggerate this slow corrosion pace besides Fe's low standard-electrode potential factor. This article highlights the current status of Fe-based implants in the aspects of their in vivo biocorrosion and biocompatibility. Moreover, a detailed discussion on the excessively slow in vivo corrosion-rate phenomenon of the Fe-based implants is presented in this review to provide greater insight into the contributing factors that lead to this major concern over Fe use as potential medical implants.