

A biocompatible material

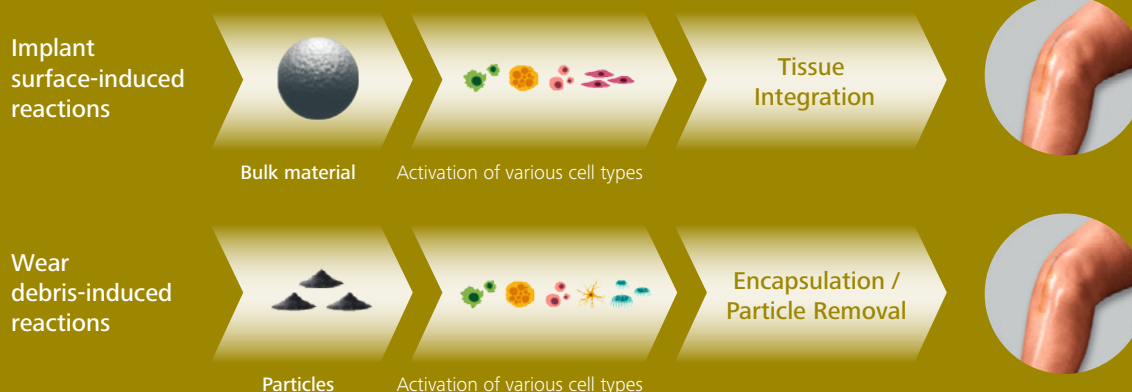
- Is able to perform its desired function with respect to a medical therapy.
- Generates the most appropriate beneficial cellular or tissue response.
- Elicits no undesirable local or systemic effects in the recipient.

Two types of cellular or tissue response mechanisms

- Implant surface (bulk)-induced immune reactions that occur immediately upon implantation
- Delayed wear debris-induced reactions that often arise years after the primary surgical procedure and which are induced by wear particles.

Appropriate cellular or tissue response

Appropriate and adequate immune response with a proper activation of the immune cells takes place, including a directed biological response, a good host-implant integration, a desired healing process as well as in the case of wear-induced immune reaction the possible encapsulation of wear particles and their removal.



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KEY TAKEAWAYS

HEALTH ECONOMICS & POLICY



Inappropriate cellular or tissue response (continued)

An implant material can activate and initiate an inappropriate immune response. For example, degradation and corrosion of the implant over time can trigger an elevated and uncontrolled immune response with a chronic activation of immune cells and fibrosis that can lead to implant failure.

Local and systemic toxicity

Metal ions that are eluted into the peri-implant space or generated by wear and corrosion at the modular junction can either accumulate locally within cells and tissues which surround the implant. However these metal ions can also spread systemically via their transportation through the blood stream and hence can accumulate in distant organs (e.g. liver, heart, spleen ...) that can lead to metal intoxication, which can cause long-term systemic complications to the organism.



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Published by CeramTec GmbH
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ceranews@ceramtec.de | www.ceranews.com
Stuttgart district court commercial register, no. 734826
VAT identification no. DE814031115

Responsible Editor: Dr. Henrich Mannel
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Concept and Editing: Florence Petkow

MT-00534-1912-EN-03

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