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# Glucose Sensor Membranes for Mitigating the Foreign Body Response

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## Abstract

Continuous glucose monitoring devices remain limited in their duration of use due to difficulties presented by the foreign body response (FBR), which impairs sensor functionality immediately following implantation via biofouling and leukocyte infiltration. The FBR persists through the life of the implant, culminating with fibrous encapsulation and isolation from normal tissue. These issues have led researchers to develop strategies to mitigate the FBR and improve tissue integration. Studies have often focused on abating the FBR using various outer coatings, thereby changing the chemical or physical characteristics of the sensor surface. While such strategies have led to some success, they have failed to fully integrate the sensor into surrounding tissue. To further address biocompatibility, researchers have designed coatings capable of actively releasing biological agents (e.g., vascular endothelial growth factor, dexamethasone, and nitric oxide) to direct the FBR to induce tissue integration. Active release approaches have proven promising and, when combined with biocompatible coating materials, may ultimately improve the *in vivo* lifetime of subcutaneous glucose biosensors. This article focuses on strategies currently under development for mitigating the FBR.

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**Abbreviations:** (DX) dexamethasone, (FBGC) foreign body giant cell, (FBR) foreign body response, (NO) nitric oxide, (VEGF) vascular endothelial growth factor

**Keywords:** biocompatibility, foreign body response, *in vivo* glucose sensor, tissue integration

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