Patent Search

Invention Title	POLYMER/ANTIBIOTIC COATED MUGA (ANTHERAEA ASSAMENSIS) SILK SUTURE
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Inventor

Name	Address	Country	Nationality
ARUP JYOTI CHOUDHURY	DEPARTMENT OF PHYSICS, TEZPUR UNIVERSITY, NAPAAM-784028, SONITPUR, ASSAM, INDIA	India	India
GAZI AMEEN AHMED	DEPARTMENT OF PHYSICS, TEZPUR UNIVERSITY, NAPAAM-784028, SONITPUR, ASSAM, INDIA	India	India
NAMITA OJAH	DEPARTMENT OF PHYSICS, TEZPUR UNIVERSITY, NAPAAM-784028, SONITPUR, ASSAM, INDIA	India	India

Applicant

Name	Address	Country	Nationality
TEZPUR UNIVERSITY	TEZPUR UNIVERSITY, NAPAAM-784028, SONITPUR, ASSAM , INDIA	India	India

Abstract:

The present invention relates to a silk fibroin suture material, obtained from muga silkworm Antheraea assamensis, coated with antibiotic loaded polymer and a method of preparation thereof. The Antheraea assamensis silk fibroin (AASF) fibers are obtained from the cocoons of muga silkworm followed by combining and twisting the fibers to form yarn which is subsequently subjected to surface modification by low temperature (30-35°C) air dielectric barrier discharge (DBD) plasma at atmospheric pressure and simultaneous sterilization. The plasma surface modified AASF is then coated with antibiotic-loaded polymer, preferably chitosan, wherein predetermined amount of antibiotic, preferably ß-lactam antibiotic is added to the chitosan solution followed by drying in vacuum.

Complete Specification

FIELD OF THE INVENTION

The present disclosure, in general, relates to the surface modification of Antheraea assamensis silk fibroin (AASF) using low temperature air dielectric barrier discharge (DBD) plasma at atmospheric pressure followed by coating with antibiotic-loaded polymer. This invention relates to development of AASF as controlled drug eluting suture with excellent mechanical properties and antibacterial activity using an efficient, environmentally friendly and low-cost method.

BACKGROUND AND PRIOR ARTS

Natural silk obtained from Bombyx mori silk fibroin (BMSF) has been extensively characterized and commercially used as suture biomaterial for centuries as it exhibits some of the important features of suture such as good handling characteristics, low memory, ease in sterilization, biocompatibility, encapsulation within tissues, etc. However, there are few serious concerns related to Bombyx mori silk as suture biomaterial. From studies reported by G. H. Altman, in an article published in Biomaterials, vol. 24, 2003, entitled “Silk-based biomaterials” suggest that Bombyx mori silk suture causes mild inflammatory response initially including conjunctival and episcleral hyperemia progressing to chemosis and nodular episcleritis, peripheral corneal ulceration and wound necrosis after one week in-vivo. It is also revealed that the degradation substances (proteolytic) are usually attacked by macrophages and giant cell leading to encapsulation and formation of

granulomas which causes allergic reaction to the skin. Furthermore, low knot security, increased risk of infection due to microbial attack, unfavorable surface properties (hydrophobicity, surface roughness etc.) etc. raise the serious concern about biocompatibility of BMSF and its utilization in surgical process. It has been disclosed in US Pat

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