In Vivo Blood Compatibility of Regenerated Silk Fibroin

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Silk fibroin was dissolved in calcium chloride/ethanol/water mixture (1/2/8 in mole ratio) at 70°C for 4 hrs and dialyzed against water using cylindrical cellulose dialysis sack. The solution was freeze dryed and amorphous silk fibroin flake was obtained. The flake was used for the sample to examine anti-thrombogenicity, absorption property, and foreign body reaction. The silk fibroin solution for coating was prepared by dissolving the flake in formic acid before the *in vivo* test. The antithrom-bogenicity and the absorption property were examined by inserting the soft pliant polyester multifilament suture coated with the silk fibroin using a dipping and casting method into the peri-pheral vein of a dog. On the other hand, for the foreign body reaction test a polyester mesh coated with the silk fibroin was implanted into the subcutaneous tissue of a dog. After a given period of time the vein and the tissue were taken out from the dogs and observation and evaluation were carried out by optical microscopy. It was concluded that the silk fibroin is a highly absorbable antithrombogenitic materials, but has a problem for the foreign body reaction (Table 1).

Table 1. *In vivo* results of denatured silk fibroins

Sample	Thrumbus formation		Absorbability	Foreign body reaction	
	Implantation period(day)		Implantation period(day)	Implantation period(day)	
	1	14	14	14	28
SF[a)]	-	± ~ +	+++	++	+++
SF-15[b)]	-	-	+++		
SF-240[b)]	-	-	+++		

a) as coated

b) treatsd with 50% aqueous methanol solution after coating ; the numbers denote treating time(min).