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In vivo biodegradation of new haemostatic biomaterials

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Introduction. The new synthesized haemostatic biomaterial *Matemo*, is a protein meal produced by fractionation of human plasma. In previous studies it revealed its excellent haemostatic properties, so that it could become the best biomaterial to prefer in large surgical demolition. It also showed an excellent biocompatibility for its composition of human proteins, very similar to that of human tissues. This work now intended to study the in vivo biodegradation of this new biomaterial compared with another horse collagen-based haemostatic biomaterial (*Antema)* in order to find the best material to fill the empty cavities resulting after surgical resection of tumor masses.

Materials and methods. For the experimental protocol the dorsal skin of each anesthetized animal was shaved, incised and two pouches were performed inside the subcutaneous tissue of the back, to introduce a specimen (1 cm2 of size) of *Matemo* on the left side, and on the right side the horse-collagen biomaterials (*Antema*). The same operation was repeated in 3 animals, and 3 other rats were used as controls and treated only with the selected anesthetic cocktail without intervention. The treated animals were killed all after 90 days from the operation. After death the dorsal skin of each animal was inspected in the two sides of implant and the samples from the skin and the subcutaneous tissues were taken in both sides of the back, to submit to the histological studies.

Results The histological exams carried out in this experiment showed that at the 90th day post-implant both biomaterials were completely reabsorbed, but the sites of implantation were very different between them. In the side of the implanted *Matemo* the subcutaneous tissue showed a very poor infiltration of inflammatory cells, with a foreign body reaction fully resolved without proliferation of new fibrous tissue, neither dermal adhesion to the muscular plane. In the site of *Antema* implant, indeed, at the same dead line a significant infiltration of inflammatory cells jet persisted and much dense fibrous tissue attached the dermal plane to the underlying muscles.

Keywords: Biomaterials, Haemostatic, Biodegradation, Antema, Matemo