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Abstract

Validation of the Chick Chorioallantoic Membrane (CAM) Model for Biocompatibility Analysis of Implant Materials

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The present study aimed to compare the tissue responses to biomaterials in the chick chorioallantoic membrane (CAM) model with those from the subcutaneous implantation model in rats at an early time point. It was especially investigated whether histopathological scoring according to DIN EN ISO 10993-6 is also possible after biomaterial implantation using the CAM model and to what extent the values differ from the data obtained from small animal experiments.

Implantation of a xenogeneic bone substitute using the CAM model for 24 h and subcutaneous implantation model in rats up to 10 days post implantation were conducted. Standardized histological and histopathological methods were used to apply for histopathological scoring according to DIN EN ISO 10993-6.

The histological analysis as well as the histopathological scoring revealed that the tissue responses to the xenogeneic bone substitute were completely comparable in both organisms with no visible or statistical differences.

We suggest that bioincompatible biomaterials can already be sorted out in the context of THE preclinical in vivo test phase. Such pre-testing before the required small animal tests might clearly contribute to the 3R-concept to reduce the number of animals (REDUCE).

AUTHOR'S STATEMENT

Conflict of interest: Authors state no conflict of interest. Ethical approval: The preclinical in vivo experiments were conducted at the Faculty of Medicine at the University of Niš (Serbia) as previously described (18-20). Initially, approval by the Local Ethical Committee based on the Veterinary Directorate of the Ministry of Agriculture, Forestry and Water Management of the Republic of Serbia (decision number 323-07-01762/2019-05/9, Date: 01 March 2019) was obtained.

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