

Bleomycin mouse model for systemic sclerosis (SSc)

Species: mice

Fields of application: Inflammation

Systemic sclerosis (SSc) or scleroderma is an inflammatory rheumatic connective tissue disease that is characterized by fibrosis of the skin and various internal organs. SSc is characterized by the excessive accumulation of extracellular matrix proteins in (among others) the skin, vascular injury and immunological abnormalities.

Bleomycin model

One of the animal models available for SSc is the murine bleomycin-induced dermal fibrosis model. Bleomycin is an antibiotic anti-tumor agent that has several actions, such as the production of free radicals, induction of apoptosis and the upregulation of extracellular matrix protein gene expression. Chronic application of bleomycin to the (shaved) skin by s.c. injections in the lower back area has been shown to induce skin fibrosis accompanied by infiltration of the injected skin with several immune cells such as T cells, monocytes, macrophages and mast cells.

Endpoints/Outcome parameters: Due to the fact that bleomycin induces inflammatory processes in the skin, one way to observe the progression of the inflammation *in vivo* is by the use of Luminol – based Bioluminescence imaging (BLI). The IVIS Spectrum (Caliper Life Sciences) is used as optical imaging technology to facilitate non-invasive longitudinal monitoring of disease progression (e.g. inflammation), cell trafficking and gene expression patterns in living animals. Luminol –based BLI, a measure of myeloperoxidase (MPO) activity is employed as an *in vivo* marker of inflammation.

At the end of the experiment, histological analysis of the skin can be performed such as the Masson trichrome stain for fibrosis and H&E Staining.

Readout parameters

We additionally offer fluorescence-activated cell sorting (FACS) / immunohistochemistry (IHC) analysis of tissue and circulating immune cells; analysis of cytokines / chemokines / lipid profile and microglia activation. In addition, in collaboration with the Institute of Clinical Pharmacology (Pharmazentrum Frankfurt/ZAFES, Frankfurt am Main) we offer the use of multi Epitope Ligand Carthography (MELC) which allows staining of the same tissue section with up to 100 fluorescent markers.

Quality management and validation: The model is under validation with reference compounds.

References: Parnham, M. J., de Bruin, N., Scholich, K., Schmidt, M., Jordan, H., Geisslinger, G. (2014). Non-invasive bioluminescence imaging (BLI) of inflammation in murine allergic contact dermatitis. Proceedings of the British Pharmacological Society, 12 (3), abst033P
<http://www.pa2online.org/abstracts/1vol12issue3abst033p.pdf>.

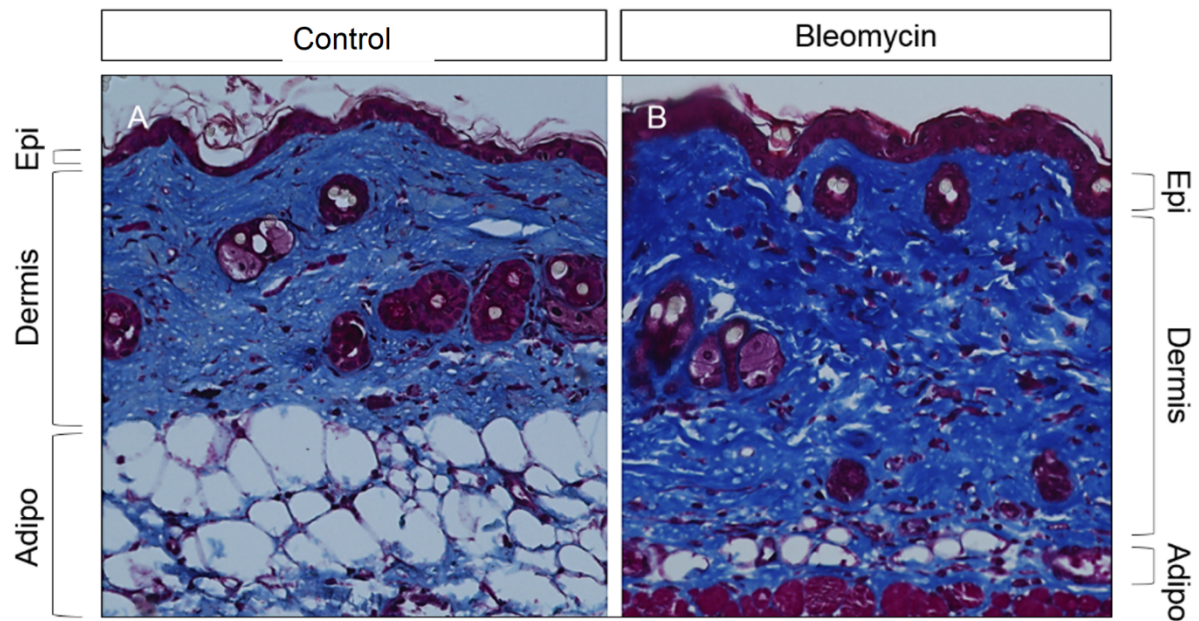


Figure: Bleomycin animal model: the Masson's Trichrome staining is widely used for a variety of purposes, primarily to visualize collagen fibers, which appear in blue.

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