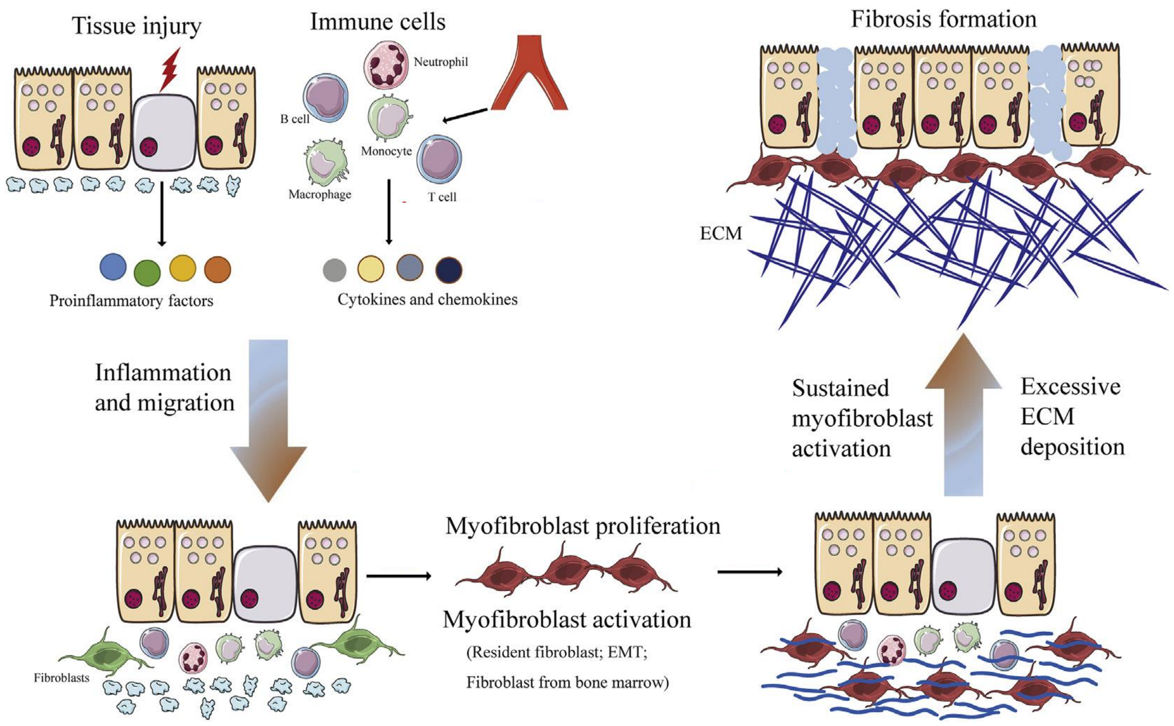
Systemic Sclerosis Animal Models

2024.08

Background

Tissue fibrosis is the ultimate pathological change in many chronic diseases which is characterized by the differentiation of resident fibroblasts into myofibroblasts during inflammation, accompanied by excessive extracellular matrix deposition in the tissues, and ultimately leading to failure of normal organ function. The affected organs and tissues include heart, skin, lung, liver, kidney, etc.



Li X, Mo N, Li Z. Journal of Ginseng Research, 2020, 44(3): 386-398.

Selecting preclinical *in vivo* models that are reflective of clinical outcome is a key challenge in the development of new therapies to treat fibrotic diseases.

Our fibrosis platform shows much insight into the pathogenesis of tissue fibrosis and the organ fibrosis models in rodents, contributing to the discovery of effective anti-fibrotic drugs.

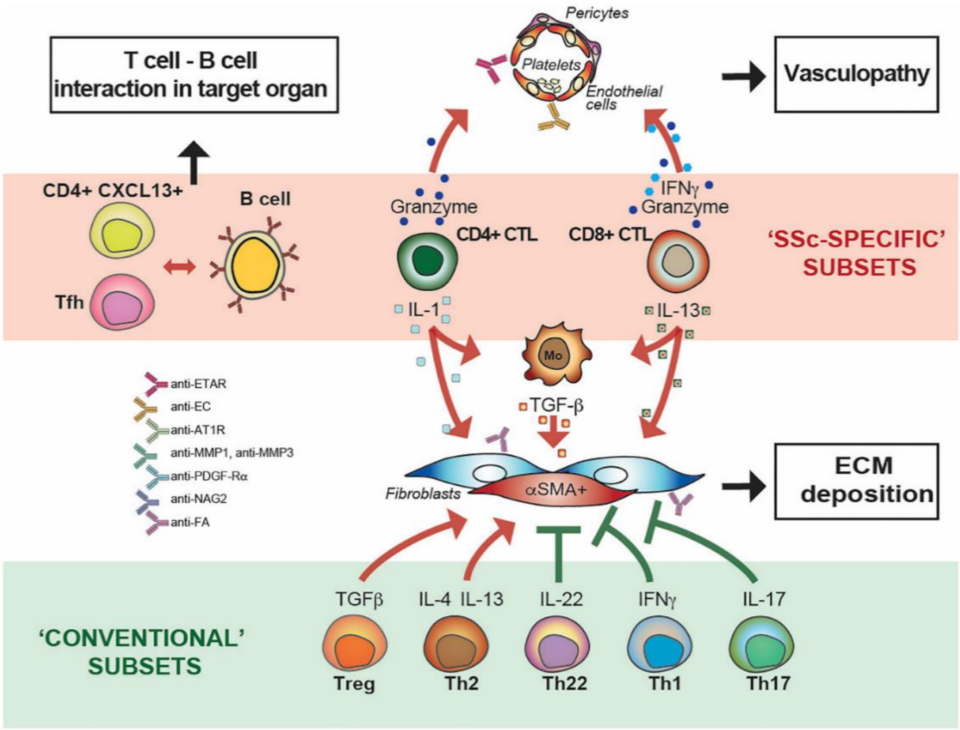
Model Summary List of Fibrosis Platform

Model Type	Model Establishment Method	Modeling Period	Species
Systemic Sclerosis (SSc)	Bleomycin (BLM) induced SSc	29 days	Rat & mouse
	Collagen V induced SSc	121 days	Rat & mouse
Pulmonary Fibrosis	Bleomycin induced pulmonary fibrosis	22 days	Rat & mouse
	SiO_2 induced pulmonary fibrosis	29 days	Rat & mouse
	FITC induced pulmonary fibrosis	21 days	Mouse
Liver Fibrosis	CCl_4 induced fibrosis	4 weeks	Rat & mouse
	BDL (bile duct ligation) induced liver fibrosis	11 days	Rat & mouse
	ANIT induced PBC	9 days	Rat & mouse
	DDC diet induced liver fibrosis	14 days	Mouse
Renal Fibrosis	UUO (unilateral ureteral obstruction) induced renal fibrosis	11 days	Rat & mouse
	Adenine diet-induced kidney Injury	6 weeks	Rat & mouse
	5/6 Nephrectomy induced renal fibrosis	16 weeks	Rat & mouse
	AA induced renal fibrosis	4 weeks	Mouse
Cardiac Fibrosis	ISO induced cardiac fibrosis	7 days	Mouse

Systemic sclerosis model

Background & model list

- Systemic sclerosis (SSc) is characterized by skin and internal organ fibrosis, diffuse fibro-proliferative vascular modifications, and autoimmunity. Clinical presentation and course are highly heterogenous and life expectancy variably affected mostly dependent on lung and heart involvement.



Truchetet, M.E., Clinic Rev Allerg Immunol ***64****, 262–283 (2023).*

- Pathogenetic events originate from altered homeostasis favored by genetic predisposition, environmental cues and a variety of endogenous and exogenous triggers.

- Epigenetic modifications modulate SSc pathogenesis which strikingly associate profound immune-inflammatory dysregulation, abnormal endothelial cell behavior, and cell trans-differentiation into myofibroblasts.

Available Systemic Sclerosis Animal Models

- Bleomycin induced systemic sclerosis
- Collagen V induced systemic sclerosis

Systemic sclerosis model

Case study: Bleomycin (BLM) induced systemic sclerosis (SSc)

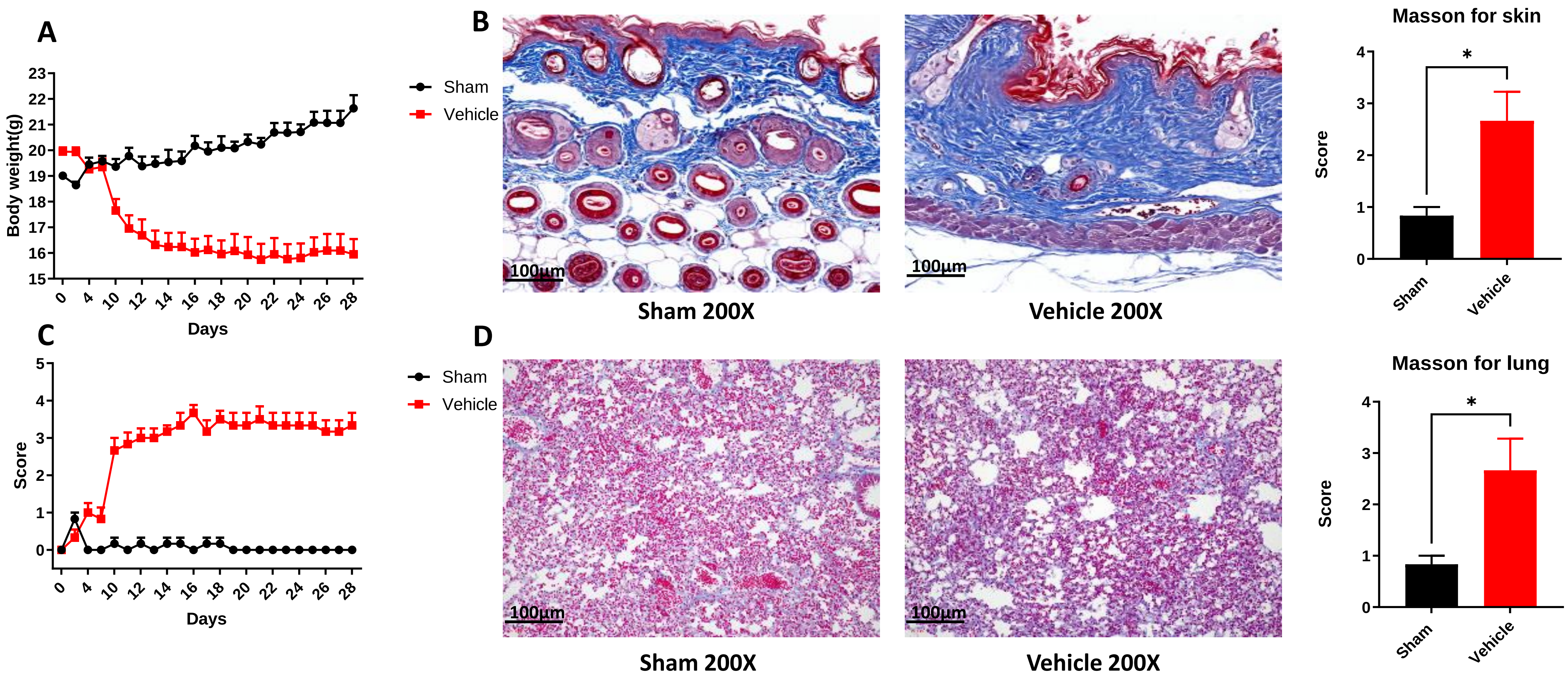


Figure: Bleomycin induced systemic sclerosis in mice. **A**: Body weight record during the bleomycin induction period. **B&D**: Masson staining results of harvested skin and lung tissues. **C**: Clinical score (skin) for the systemic sclerosis.

Systemic sclerosis model

Case study: Collagen V induced systemic sclerosis (SSc)

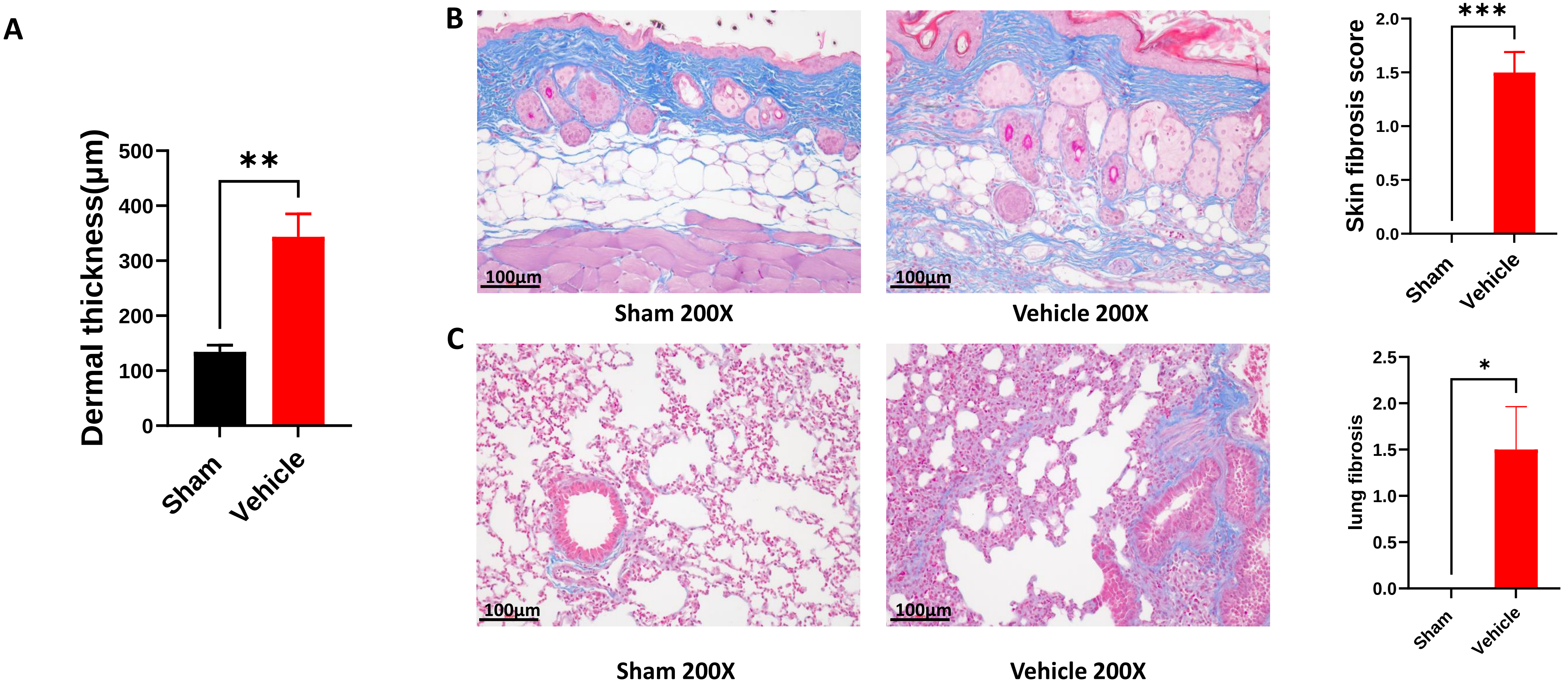


Figure: Collagen V induced systemic sclerosis in mice. **A**: Dermal thickness of mice. **B&C**: Masson staining results of harvested skin and lung tissues.

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For questions and requests, please email to Pharmacology-BD-Translation@wuxiapptec.com

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