

Xenograft and Syngeneic Tumor Models in Rats



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OncoWuXi Newsletter

Introduction of rat models

■ Advantages of Rats in preclinical efficacy studies compared with mice:

- More similar metabolism and physiology to human
- Easier for orthotopic model surgery, vascular manipulation and some types of imaging
- Larger sample size to ensure sufficient amount for analysis
- Consistent animal species to those in toxicology and some DMPK studies

■ Widely-used immuno-deficient rats and their severity levels of immuno-deficiency:

Strain	Hair Coat	T-Cell Deficient	B-Cell Deficient	NK-Cell Deficient	Genetics
Nude Rat	No	Yes	No	No	Inbred
FRG Rat	Yes	Yes	Yes	Yes	Inbred
SRG Rat	Yes	Yes	Yes	Yes	Inbred

Xenograft models in rats

Human cell-line derived xenograft models in rats

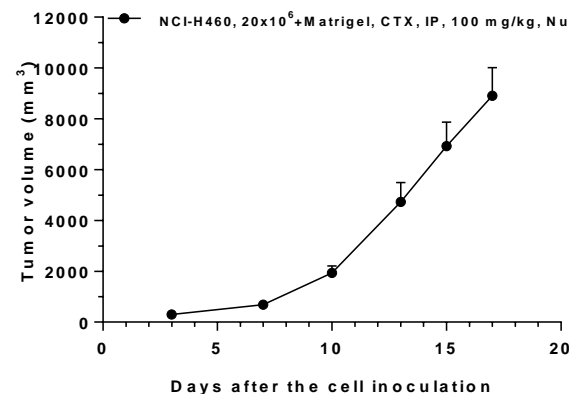
- Flexibility with the routes of cell inoculation: subcutaneous, orthotopic or metastatic/systemic models;
- Growth kinetics in different rat strains;
- SOC validation

	Cancer Type	Cell Line
Xenograft Models	Bladder Cancer	RT-112
	Colon Cancer	HCT-116 ^S , HT-29 ^S , DLD-1
	Epidermoid Cancer	A431
	Lymphoma Cancer	SU-DHL-4,Raji ^S
	Myeloma Cancer	MM1S, MM1R
	Leukemia Cancer	THP-1, MV4-11, K562, K562-luc(systemic), MOLM-13, Molt-4-luc (systemic)
	Lung Cancer	NCI-H460 ^S , NCI-H1299, NCI-H1975, A549, NCI-H1373, NCI-H2122, NCI-H441, Calu-6 ^S
	Melanoma Cancer	A375 ^S , A2058
	Ovarian Cancer	A2780 ^S ,OVCAR-3
	Prostate Cancer	PC3, 22Rv.1, LNCap
	Pancreatic Cancer	CAPAN-1, Mia-Pa-ca-2, HPAC
	Breast Cancer	MDA-MB-231-luc(SubQ), MDA-MB-231-luc (Orthotopic) ^S , HCC1954 ^S , MCF-7
	Liver Cancer	Hep3B-luc (orthotopic), HepG2
	Glioma	U87-luc2 (Orthotopic)
Renal Cancer	Caki-1,786-O	

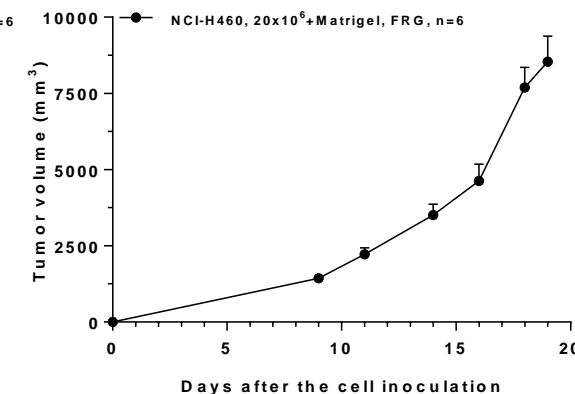
^S: SOC validated

Growth curve and SOC data of NCI-H460 in different strains

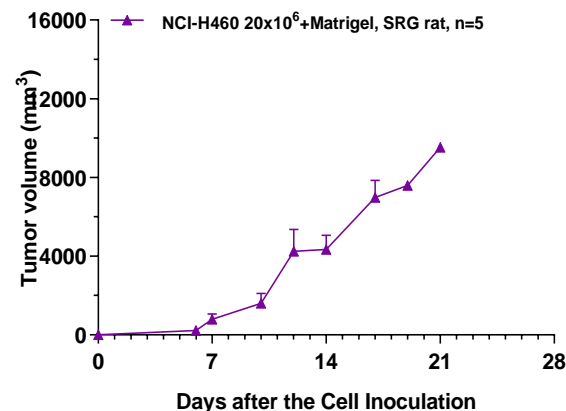
NCI-H460 in nude rat



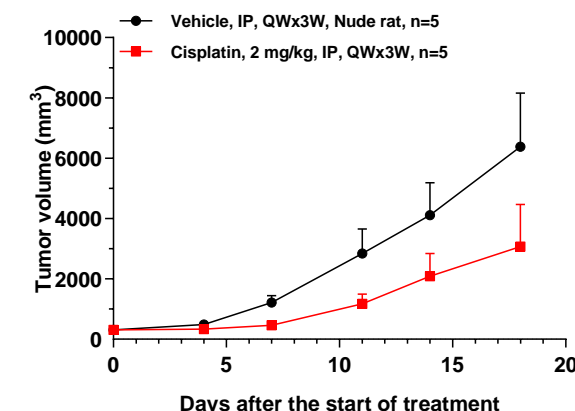
NCI-H460 in FRG rat



NCI-H460 in SRG rat



Cisplatin in NCI-H460 model



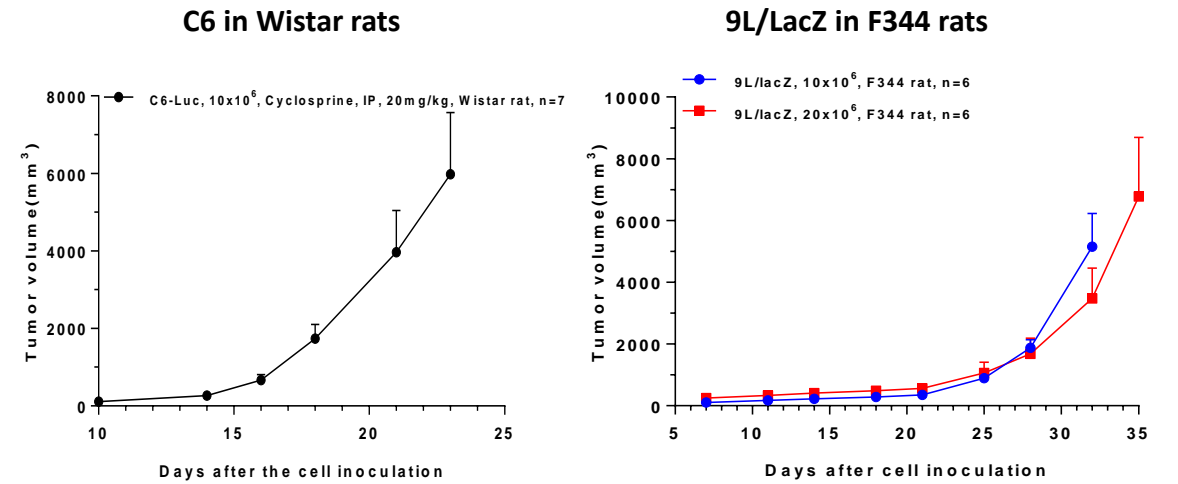
Syngeneic models in rats

Rat cell-line derived syngeneic models in rats

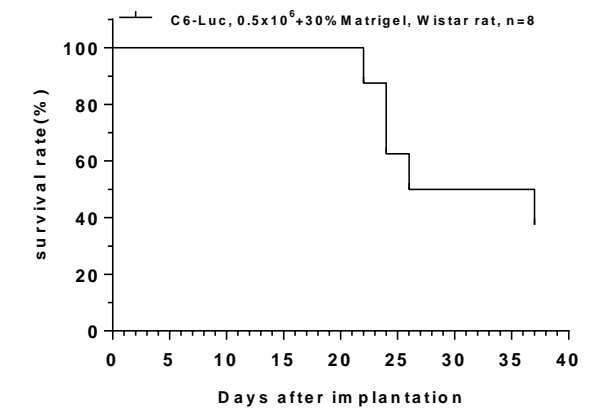
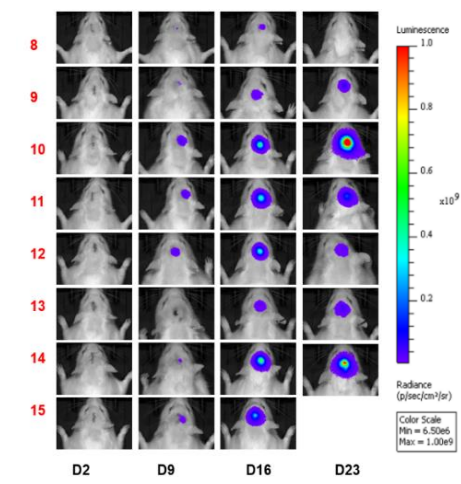
- Syngeneic rat models have intact immune systems, enabling the innovation of immunotherapies.
- Immune profiling and additional end-points: Flow-cytometry, multiplex IHC/IF, NGS – Nanostring and scRNAseq.

	Cancer Type	Cell Line
Syngeneic Models	Glioma	C6-luc (SubQ), C6-luc (Orthotopic), F98npEGFRvIII 9L/lacZ
	Hepatoma	N1-S1-luc (Orthotopic)
	Mammary carcinoma	13762 MATBIII
	Sarcoma	XC
	Squamous cell carcinoma	SCC131

Syngeneic models in immunocompetent rat



C6-luc orthotopic model in Wistar rats



Instruments for complex surgeries and drug delivery

Surgical techniques enabling better clinical relevance

■ Intravenous drip

Drugs can be delivered into the blood circulation directly, and the injection rate is controllable and adjustable.



■ Transcatheter Arterial ChemoEmbolization (TACE)

The commonly used form of locoregional therapy in unresectable HCC.





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