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Rats and Mice as Models in Cardiovascular Research

Traditional Models of Myocardial Ischemia

	•Extensive use - acute myocardial ischemia and infarction •Large vessels •Closed chest manipulation of coronary arteries	**•Extensive and variable collateral system •Cost •Social pressure against use**
	–Anatomy closely parallels human heart –Lack of significant collaterals –Large animal, more socially acceptable	**–Generally young immature pigs used –Often need multiple anesthetic agents –Vessel size relatively small –More prone to arrthymias**
	–Established model for infarct size studies –Arteriosclerosis with cholesterol feeding –Utilized for mechanisms of pre-conditioning	**–Blood sampling limitations –Instrumentation limitations**
	Used to study cellular electrophysiology	**Large collateral blood flow effectively preventing study of regional ischemia**
	–Standardization of regional ischemia –Homogeneous study population –Reproducible infarct size and arrhythmias –Cost	**–Size –Limitation of blood sampling and instrumentation**
	Transgenic models available	**•Instrumentation •Blood sampling**
	–Stable preparation acutely –Standardize ischemia & reperfusion conditions –Isolates heart from neuro-humoral interaction	**–Deteriorates over time (5-10%/ hr) –Acellular perfusate –Heart isolated from neuro-humoral interaction**

In general, the further one moves away from the study of human tissues, the greater becomes the quantity, quality and reproducibility of the data and the lower becomes the cost and time-to-result, but unfortunately this is usually offset by the model becoming

increasingly less relevant to the human condition-especially when the disease process such as ischemia is the focus of study

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