

ABSTRACT	TITLE	AUTHOR(S)	INSTITUTION	
#5	Supporting the 3Rs by Increasing Catheter Patency Duration in Rodents	Andree Lapierre	Instech Laboratories, Inc	Abstract

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Supporting the 3Rs by Increasing Catheter Patency Duration in Rodents

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Vascular access is a key element in many preclinical studies. In chronic protocols involving repeated administration of compounds, blood sampling, or both, maintaining a prolonged catheter patency duration is essential. Several factors influence the catheter functionality, the most critical being the accurate positioning of the catheter tip at an optimal anatomical site. The use of a closed system is another crucial determinant; closed systems incorporating transcutaneous buttons have been shown to significantly extend catheter patency performance. Catheter material and tip design also play important roles. Polyurethane is widely considered the material of choice, while a rounded tip minimizes endothelial damage and reduces the risk of thrombus formation. Strict adherence to aseptic technique and the use of sterile solutions are essential to prevent infection and biofilm formation, thereby promoting an unobstructed catheter flow. In addition, employing a positive pressure technique during catheter locking decreases the likelihood of intraluminal clot formation. Collectively, these factors must be carefully considered and consistently applied to achieve optimal catheter patency duration.

Beyond extending the openness period of the catheter, the transcutaneous button offers additional advantages that support the principles of the 3Rs. With respect to Refinement, the protective metal cap covering the button enables group housing, improving animal welfare and respecting rodents' natural social behaviors. The transcutaneous button also reduces animal handling and associated stress, contributing to enhanced well-being and better data quality. In terms of Reduction, prolonged catheter patency duration decreases the number of animals subjected to surgical procedures and enrolled in studies, thereby supporting more ethical and efficient chronic research designs.