

Materials List for:

# Barnes Maze Testing Strategies with Small and Large Rodent Models

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## Materials

Name	Company	Catalog Number	Comments
<b><i>NOTE: Those items that are for small rodents only are bolded. Those items that are for large rodents only are italicized. Items neither bolded nor italicized are for both.</i></b>			
Barnes Maze platform with 12 or 20 escape holes every 30°. For rats, each hole is 10.5 cm in diameter and 4 cm from the maze top edge. For use with automated tracking programs, a black top for white rodents or a white top for pigmented rodents is needed. For mice and rats, this circular top is 95 and 122 cm in diameter, respectively.	US Plastics Corp, Lima, OH	42625	This is the top of the Barnes Maze and the surface that the rodent is placed upon. It can be constructed from a variety of materials (e.g., Plexiglas), but for endocrine disruptor work, polypropylene BPA-free material is optimal. One of the holes leads to the an escape cage; all other holes are blind-ending or false-bottomed. For the rat maze, small slides on the underside of the maze platform allow the escape cage and false bottoms to slide in.
<b>2 in Polypropylene pipe plug (24)</b> <b>2 in 90° Black polypropylene elbow (12)</b> <b>2 in x 6 in Polypropylene pipe nipple (1)</b>	US Plastics Corp, Lima, OH	<b>30724</b> <b>32086</b> <b>30712</b>	<b>These are only necessary for the small rodent (e.g. mouse) Barnes Maze. These adaptations are either blind-ending tubes/ elbows or one of the tubes is connected to the pipe nipple that then leads to the escape cage.</b>
<i>False bottoms for rat Barnes Maze</i>			<i>These were custom made of ABS plastic and vacuum molded for the rat maze apparatus.</i>
<b>Circular aluminum wall/barrier (50 cm high) around the maze</b>	Ace Hardware, Columbia, MO		<b>In the case of small rodents (e.g., mice), this barrier prevents them from falling off the maze; the rat apparatus generally does not require this. The wall may not be needed for laboratory mice that are relatively tame.</b>
Support stand for maze platform top	US Plastics Corp, Lima, OH	42625	The stand supports the maze platform top such that it is elevated above the floor (typically, 70-100 cm) to motivate the rodent to locate the escape cage. The stand can be constructed of any material.
White noise	SleepMate Sound Conditioner, Marpac, Rocky Point, NC	980A	Background noise may be used to block out peripheral acoustic cues that may confound Barnes Maze testing across trials and animals

Light fixtures and 300-500 W bulbs encased in aluminum shells. For example, Utilitech 500 W halogen portable work lights.	Ace Hardware or Lowes		Bright lights provide a mildly aversive stimulus which motivate the rodent to locate the escape cage. The lights are generally suspended ~150 cm above the maze top.
Escape cage. For small rodents, this can be a polypropylene cage (27.8 cm x 7.5 cm x 13 cm).	Ancare, Bellmore, NY	N40 PP	The rat escape cage here was custom built and has a ramp leading into the escape cage.
<i>Opaque tube (rats only) (27 cm diameter; 23 cm height) with a piece of thick cardboard to cover the top.</i>			<i>The tube is placed in the center of the maze and the rat is placed into the tube from the top which is covered with the cardboard. A handle on the outside of the tube allows easier lifting of the tube, which then begins the trial. The tube can be constructed of any material, but should be opaque.</i>
High resolution video camera (e.g., Panasonic Digital Video Camera)	Panasonic, Secaucus, NJ	ICV19458	The video camera is positioned overhead and records trials for later analysis.
Extra- or intra-maze geometric cues made of high quality cardboard construction paper	any office supply store, such as Staples		These visual cues orient the animal within the maze environment, providing cues as to the spatial location of the escape cage; in rats, extra-maze cues on the walls work well, whereas in small rodents that require a wall around the maze, intra-maze cues must be used.
<b>Black curtain to surround the maze (small rodents only)</b>	<b>any fabric and crafts store, such as Jo-Ann Fabrics</b>		<b>A black curtain is used in small rodents (especially wild species, e.g. <i>Peromyscus</i>) to maintain attention within the maze confines.</b>
70% Ethanol	Fisher Scientific	BP2818-4	After each trial, the maze top and escape cage are cleaned to eliminate potential odor cues for consecutively tested rodents.
Tracking software program, such as Ethovision, and computer with appropriate video card and substantial (1 TB or more) hard-drive space. Alternatively, videos can be recorded directly to the computer for later analysis using a program such as Win TV (Hauppauge Computer Works, Inc.).	Noldus (Leesburg, VA)		Tracking software is required to analyze trials for latency to locate the escape cage, velocity, distance traveled, time spent resting, time spent moving, time spent in the correct versus incorrect quadrants, time spent around the escape hole, number of errors or entries into incorrect holes, and overall search strategy employed to find the escape cage.
External hard drives, such as Seagate or WD, with a minimum 1-2 TB of memory	Any office supply store, such as Staples.		Videorecordings should be backed up in at least one separate location.
Videorecording program, e.g. WinTV program	Hauppauge Computer Works, Inc., Hauppauge, NY		If tracking software is not available at the time of the testing, the trials should be video-recorded for later analysis