Benchmarks

1987. A 2-step procedure for efficient electro-transfer of both high-molecular-weight (greater-than 400 000) and low-molecular-weight (less-than 20 000) proteins. *Anal. Biochem.* 162:370-377.

11. Pawlowski, K., P. Twigg, S. Dobritsa, C. Guan, and B.C. Mullin. 1997. A nodule-specific gene family from *Alnus glutinosa* encodes glycine- and histidine-rich proteins expressed in the early stages of actinorhizal nodule development. *Mol. Plant Microbe Interact.* 10:656-664.

Support from USDA NRICGP grant no. 98-35305-6545 to B.C.M. is acknowledged. Address correspondence to Beth C. Mullin, Department of Botany, The University of Tennessee, 437 Hesler Biology Building, Knoxville, TN 37996-1100, USA. e-mail: bmullin@tennessee.edu

Received 14 December 2000; accepted 27 March 2001.

C. Maillet, R.K. Gupta, M.G. Schell, R.G. Brewton, C.L. Murphy, J.S. Wall, and B.C. Mullin
*The University of Tennessee
Knoxville, TN, USA*

Sending Plasmid DNA by Mail

BioTechniques 30:1230 (June 2001)

It is quite common to send small samples of plasmid DNA or other relatively stable material to other researchers. The most convenient method of doing this is to include it in a plain envelope mailed to the recipient at the cost of a first-class stamp. We have observed that it is common practice to pipet a few microliters of DNA into a 1.5-mL microcentrifuge tube, tape the tube to a letter describing its contents, insert the tube into a standard envelope, and trust it to the postal service.

While conceptually simple, this plan can be thwarted by automated sorting

Figure 1. Tube and sample preparation. In the first step, 10 μ L of a plasmid solution are pushed into the center of a 2-inch section of polyethylene tubing using a micropipet. Next, the ends of the tubing are sealed by heating the ends over a flame and quickly pinching them between the thumb and index finger.

machines that slide the envelope through machines that accept letters no thicker than 2 mm. Over the years, we have received empty envelopes containing a hole in the side, punctured envelopes containing a letter with a matching hole, and intact envelopes containing shattered plastic tubes that now fit through a 2-mm gap. Using the DNA that might be clinging to the tube is risky. We usually ask for another shipment, but the mishap delays experiments and further inconveniences both the sender and us. In the USA, padded envelopes are not put through sorting machines and are therefore more reliable, but they are also more expensive and cost more to mail.

As an alternative, we use a simple, reliable, and inconspicuous way of sending plasmid DNA via the postal service using a standard envelope. We cut a 2-inch length of Clay-Adams Intramedic thin-walled polyethylene tubing (1.14 mm I.D. $\times$ 1.57 mm O.D., 0.215 mm wall thickness) and push 10 μ L of the solution to be shipped to the center of the tube using a micropipet, leaving an air space at both ends of the tube (Figure 1). The tube is sealed by holding one end close to a flame and, when it starts to melt, squeezing the soft plastic quickly between the thumb and index finger. The same treatment is then applied to the other end of the tube. The tubing, which does not add significantly to the width of the enve-

lope, is then taped to a letter describing the contents and placed in the mail.

The recipient of the tube simply cuts off both sealed ends and draws the liquid out of the tubing into a plastic micropipet tip. We have never had the tubing fail to arrive intact at its destination.

This work was supported by the United States Department of Agriculture Competitive Research Grants Office and the Agricultural Research Center at Washington State University. Address correspondence to Dr. Michael Kahn, Institute of Biological Chemistry, Washington State University, Pullman, WA 99164-6340, USA. e-mail: kahn@wsu.edu.

Received 26 February 2001; accepted 14 March 2001.

Michael W. Mortimer and Michael L. Kahn
*Washington State University
Pullman, WA, USA*