

involve buffer controls, various additives, the presence of various ligands or various concentrations of the same ligand, various concentrations of the protein (prepared in advance or by varying the ratio of protein solution to reservoir solution in the drop), a series of site-directed mutants, or even a set of completely unrelated proteins. In addition to saving a tremendous amount of set-up time, having a series of related drops next to one another allows more rapid scoring of results and more facile comparisons of related results. Also, during the optimization of reservoir conditions, the multi-drop approach allows the simultaneous optimization of drop-dependent variables (*e.g.* [protein], [additive]) at very little extra effort or cost. Although significant time is saved compared to setting up separate wells with one drop/well, the preparation of each coverslip is slower so that problems such as drop

evaporation during set-up are exacerbated. Also, in our experience, with four drops per coverslip, a small fraction of the drops runs into the grease ring.

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A helium-flushed beam tunnel. By SEAN PARKIN and BERNHARD RUPP, *Biology and Biotechnology Research Program, Lawrence Livermore National Laboratory, Livermore, CA 94550, USA*

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The intensity of a Cu K α X-ray beam is attenuated in air about 1% per centimetre. For an extended Huber beam tunnel of length 23 cm (as used in conjunction with area detectors from San Diego Multiwire Systems), over 20% of the X-rays that exit the shutter are wasted. Replacement of the air in the beam tunnel by helium results in an X-ray beam that is about 25% more intense.

A hole was drilled and threaded about half way along the beam tunnel and a small brass nozzle was inserted (Fig. 1). Helium leaks through the beam tunnel at a flow rate just sufficient to prevent back diffusion of air (the exit tube from a helium box is ideal). A similar modification should be possible for beam tunnels from any manufacturer, although the magnitude of intensity gain will of course depend upon their length.

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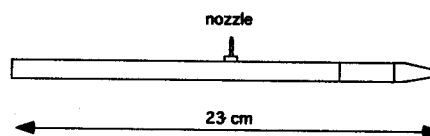


Fig. 1. Huber beam tunnel modified to allow helium flushing.