The Art of Refrigeration

When your ultra-low temperature freezer fails, you stand to lose a lot more than your temper. First, there's the loss of priceless stored product. Then the downtime. High cascade repair bills. And the worst part, when the freezer is fixed, you can't trust it.

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The Queue Cryostar Refrigeration System

The Investment

Before you make any decision on an ultra-low freezer, talk to your maintenance department about freezer serviceability and cascade repair. And send for our booklet "Cryostar Freezers: Questions and Answers" for details on how ours do twice as much with half the effort. Call Queue at (304)464-5400 or contact your area Queue Sales Representative for a literature portfolio.

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Applied Biosystems is now making highly purified phycobiliproteins available to the research community for fluorescent labeling applications.

These phycobiliproteins are sold for research use only. Patents are pending.

References

For more information, circle number 126.
11 Questions to ask before you buy an automated DNA synthesizer.

1. Do I really need an automated DNA synthesizer?
   The answer depends on your requirements for custom oligonucleotides. If you need more than one oligomer per month, an automated DNA synthesizer will be a good investment. However, if you use less than one per month, you should consider ordering custom oligomers or synthesizing them manually.

2. What advantages will an automated synthesizer provide?
   An automated DNA synthesizer will perform all of the time-consuming procedures necessary to synthesize an oligomer—without the error potential inherent in manual methods. You'll be able to synthesize more product in less time, and you'll be freed to dedicate your energies to other important tasks.

   Another advantage is around-the-clock synthesis operations. If you select a quality synthesizer—such as the Coder™ 280—you'll be able to run syntheses 24 hours a day. That can further enhance your productivity.

3. How much does an automated DNA synthesizer cost?
   The purchase price of an automated DNA synthesizer will range from about $21,000 to $68,000.

   But you should consider the reliability of the equipment and the manufacturer's dedication to service. Downtime or long waits for service can impede your productivity, costing you valuable time and expensive chemicals.

4. What are the differences among the DNA synthesizers currently available?
   Every synthesizer on the market today does basically the same thing. The primary differences are in the modes of fluid movement (pump or pressure driven), the type of reaction chamber (flow-through column or agitation vessel), and the number of reagent reservoirs. All types have been proven effective.

   Nevertheless, in evaluating synthesizers, be sure to consider the reputation of the manufacturer and the experience of the company's scientific personnel.

5. Will a synthesizer do all the work?
   All synthesizers will do the work involved in the synthesis itself, and some systems also will cleave your product from the resin. However, your product will be in crude form at this point, requiring purification by HPLC, electrophoresis, or other methods.

6. What kind of results will an automated DNA synthesizer produce?
   You can expect results equal to those produced by manual synthesis techniques. Yields will average around 95% per base coupling, provided that you use high-quality reagents and take care in handling these materials. But even the best reagents handled with utmost care will occasionally generate yields lower than 95%, regardless of some manufacturers' claims.

7. Which chemistry is best?
   There are basically two types of solid-phase chemistry being used: phosphate-triester and phosphite-triester. Each has its advantages and disadvantages, depending on the specific requirements of your synthesis operations, and each has been proven to produce quality results.

   The best choice is a synthesizer that can perform all solid-phase chemistries, rather than a system that is limited to only one method.

8. How much will it cost to run a synthesizer?
   Exact figures are difficult to project, given the wide range of costs for chemicals and other factors. However, you should be able to produce 5 O.D. units of a purified pentadecamer for less than $125 for all reagents and solvents.

9. What problems should I anticipate with an automated synthesizer?
   Even the best laboratory equipment will experience some downtime, and lesser quality synthesizers may break down or malfunction frequently, especially if they are being used continuously.

   As a consequence, you should choose a manufacturer who has a qualified, responsive field service department—one that can provide both on-site and over-the-phone technical assistance and support.

10. Can the synthesizer's microcomputer be used for other duties?
    If the synthesizer has a stand-alone microcomputer as a controller, such as the Coder 280 with Apple //e™ as the microcomputer, it is possible to do solid-phase peptide chemistry. However, it is not very practical because peptide syntheses usually require a minimum of 1 g of resin and DNA synthesizers are designed to accommodate not more than 200 mg of resin.

    Furthermore, most DNA synthesizers are not designed to handle corrosive reagents such as trifluoroacetic acid. Versatile peptide synthesizers are.

7. Will an automated DNA synthesizer do peptide synthesis as well?
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   The bottom line is this: Make sure you understand everything about automated DNA synthesizers before you invest in a system.

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Research & Development, FY 1984

by Willis H. Shapley, Albert H. Teich,
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