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SCIENCE

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

BIOSYSTEMS UPDATE

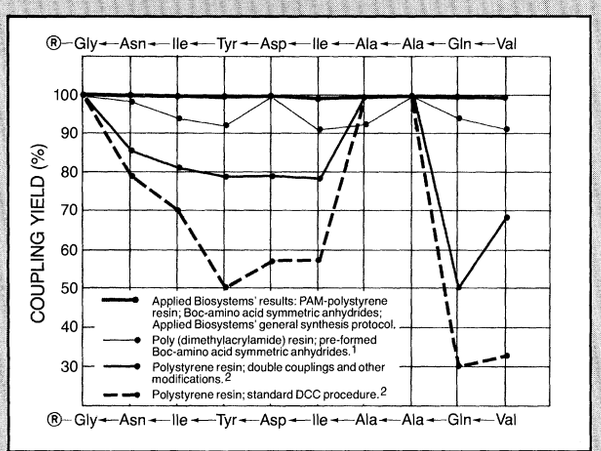
A New Approach to Automated Peptide Synthesis

Applied Biosystems is pleased to announce the first instrument designed for high efficiency peptide synthesis. The key to the high coupling yield of the Model 430A Peptide Synthesizer is an activation unit which converts the amino acid to a very efficient acylating species immediately prior to the coupling step. The defined protocol has been optimized for general peptide synthesis, but the fully programmable system allows straightforward adaptation to other chemistries.

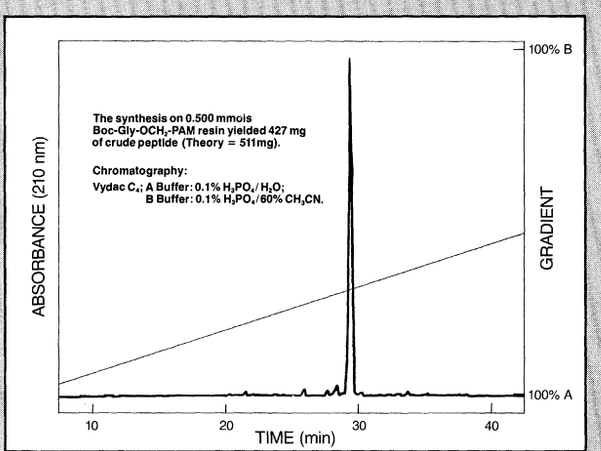
Cycle times with the general synthesis protocol are approximately one hour. A single loading of protected amino acids, reagents, and solvents will give up to 50 synthesis cycles. To insure high coupling yields, Applied Biosystems manufactures and supplies all synthesis reagents.

The data below summarize the results of the synthesis of the decapeptide Acyl Carrier Protein (65-74). These results illustrate the combined capabilities of the novel automated synthesis procedure and the high quality peptide synthesis reagents and loaded resins.

The new Model 430A Peptide Synthesizer is being introduced in the U.S. at FASEB and in Europe at Analytica. Write or phone if you'd like more information.



Amino acid incorporation during assembly of Acyl Carrier Protein residues 65-74.



HPLC chromatogram of crude, HF cleaved Acyl Carrier Protein (65-74).

ANALYTICAL METHOD	STEP YIELD (%)									
Quantitative Ninhydrin Monitoring[3].	—	99.9	99.6	99.5	99.4	99.1	99.2	99.2	99.1	98.9
Preview Quantitation by Solid Phase Sequencing of Protected, Resin Bound Peptide[4].	—	—	99.4	—	99.3	99.1	99.2	—	98.9	98.7
	RELATIVE AMINO ACID EQUIVALENTS									
Amino Acid Analysis of HF Cleaved, Deprotected Peptide	1.00	0.97	0.90	0.94	0.97	0.90	0.96	0.96	0.94	0.98
Amino Acid Residue	Gly	Asn	Ile	Tyr	Asp	Ile	Ala	Ala	Gln	Val

Step yield quantitation and amino acid analysis results for Acyl Carrier Protein (65-74) chain assembly using Applied Biosystems' general synthesis protocol. Only single couplings were used throughout the synthesis (except for Gln).

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Applied Biosystems

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COVER

Polarbjorn (ice-strengthened ship, 50 meters long) moored to an ice floe at 81.1°N, 7°E in the marginal sea-ice zone in the Fram Strait region near Svalbaard (Norwegian Arctic). Photograph was taken at the end of June 1983. See page 489. [Vernon Squire, Scott Polar Research Institute, Cambridge, England]

4 May 1984, Volume 224, Number 4648 **SCIENCE**

They're Playing Our Song

The plight of American education has become big news. So too has the relation between education and technology, which is essential to our competitive position in the world. This focus of media attention on the importance of science and learning to the national weal has never been so sharp. The accompanying sound track is loud and clear. From the reports of the National Commission on Excellence and Governor Hunt's Education Commission of the States to that of the Twentieth Century Fund Task Force on Federal Education Policy, the word is out. The quality of our public schools is declining. There is a crisis, and something must be done.

What else is new? The educational, scientific, and engineering elite of this country have been saying this for some time. Editorials, resolutions, and reports from such groups as the National Academy of Sciences, the Association of American Universities, the AAAS—in fact, from the entire education and scientific establishment—have for several years sounded the alarm. Then what has changed?

What is new is that now we are not the only ones speaking out. The media, who determine what receives public attention, are trumpeting the case. They're playing our song. Education has taken center stage. While we have their attention, we must decide what to do with the opportunity, what to ask for—how, in effect, to discharge our responsibility.

There is one answer that will not wash but is heard too often. That is, "the schools have been doing a great job, but you've asked us to do too much and paid us too little—just give us more money." Although there is some truth in this, it is defensive and self-defeating. The public wants major improvements in the quality of what goes on in the schools.

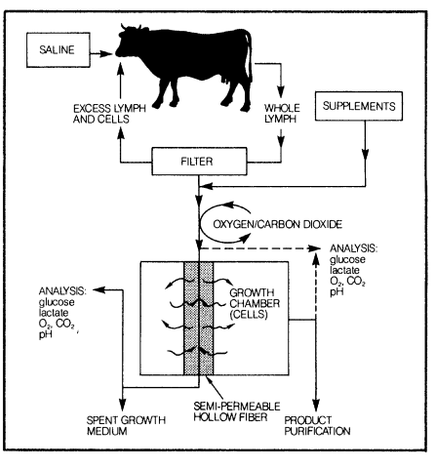
The highest priority is for professionals in many fields to reach a firm consensus on a small number of concrete measures and mobilize our considerable clout to achieve them. What measures? The public wants better teaching and more challenging and rigorous educational experiences for their children. A new program must (i) address the fact that the public schoolteacher is underpaid and undervalued and that colleges and universities no longer recruit and train teachers effectively; (ii) recognize that new federal dollars and new national leadership in education will be needed at the same time that federal interference in local decisions is reduced; and (iii) forge a new contract between a society that will not pay teachers more until taxpayer perception of their classroom performance improves and a teaching profession that will not agree to such measures as merit pay and master teachers that might help to bring this about. To make this contract, it will be necessary to establish merit-based personnel systems for teachers within the framework of collective bargaining.

A new program must also address pervasive problems in the financial capacity of state and local governments. The traditional responsibilities of state and local government—education, roads, bridges, and public safety—have faced tremendous competition from the new federally stimulated responsibilities of welfare and medical care. "Devolution" of more and more of these latter programs to the states, with less and less federal money to pay for them, has exacerbated the problem. New ideas must be found. Federal assumption of full fiscal responsibility for welfare and medicaid, large infusions of special revenue-sharing funds for education, federal support, with total local control, for science, math, and foreign language teachers and a federally financed but locally administered master teachers program are some of the ideas that have been suggested. While not all improvements cost money, some taxpayers may have to pay more taxes.

The AAAS, teacher organizations, educators, congressional friends of education, legislators, and parent groups should move quickly to seek consensus on a program of action. The opportunity and the need have appeared at the same time. They won't play our song forever.—BREWSTER C. DENNY, *Graduate School of Public Affairs, University of Washington, Seattle 98195*

NATURE'S BIOREACTOR

The New Bio-Response MCT* (Mass Culturing Technique) System Delivers Monoclonal Antibodies And Other Mammalian Cell Products When You Need Them—From Grams To Kilograms.



Insufficient quantities of desired peptides are a key cause of expensive research and production delays. The MCT system is a *new* and *unique* mammalian cell culturing process designed to overcome the obstacle of insufficient quantities of peptides by delivering the quantity you need...*when you need it!* Additionally, every step in MCT production has been developed to contain costs now and in the future while maintaining exceptional purity and quality in mammalian cell proteins.

Quantity

Unlike conventional cell-culture methods, the MCT system uses "fresh," free-flowing lymph directly from a cow. Following treatment, the lymph is continuously diffused into and out of a growth chamber. This nearly *in vivo* growth environment stimulates continuous and optimal protein secretion. The result? Large quantities of desired proteins enabling you to move to the clinic or market...*faster.*

Cost

Unlike conventional cell-culture methods that require extensive labor forces and expensive growth mediums, Bio-Response's MCT is a closed, steady-state system. In essence, the MCT system starts with a low-cost lifeline—a feeding cow—and ends with a pure, quality product. MCT ...*an optimal system at low cost.*

Purity

Unlike conventional cell-culture methods, the MCT system is designed to insure purity without tedious processing. By directing the lymph across semi-permeable membranes, MCT provides both separation of media protein from desired cell products, and a continuous nutrient flow. The ability to add or withdraw from the chamber to maintain optimal cell density permits continuous harvest of a highly pure product.

Quality

Unlike conventional methods of production that attempt to create biologically active mammalian cell products, the MCT system provides a pure-mammalian product—an exact copy of the original protein and, in the case of non-antibody polypeptides, uncompromised by inappropriate glycosylation and disulfide bond formation. There is a growing consensus favoring products produced in a mammalian cell-culture system, such as the Bio-Response MCT system.

For further information, call Bio-Response, Inc. at (415) 786-9744.

BIO-RESPONSE, INC.

*MCT (Mass Culturing Technique) is a trademark of Bio-Response, Inc.