



1997/8 FAR EAST MSPPSA SERIES

MOLECULAR BIOLOGY REAGENT SYSTEMS

VOLUME 2.

AMPLIFICATION, SEQUENCING,
CDNA SYNTHESIS, LABELING, DETECTION
& OTHER KITS

AN ANALYSIS OF
MARKET SIZE & GROWTH,
MARKET SHARE, PURCHASE PLANS &
SUPPLIER ASSESSMENT FOR
THE FAR EAST LIFE SCIENCE RESEARCH MARKET

A Multi-Client Report

by

PhorTech International
San Carlos, California

October 19, 1998

Copyright 1998 by PhorTech International, 238 Cresview Drive, San Carlos CA 94070. All rights reserved. No material contained in this report may be reproduced in whole or in part without the written permission of the publisher. This report is not intended to be, and should not be construed as a recommendation for the purchase or sale of any securities mentioned herein. The information has been derived from statistical and other sources which we deem reliable but their completeness cannot be guaranteed. Opinions expressed herein are based upon our interpretation of available information and are subject to change.

TABLE OF CONTENTS

| | |
|---|-----|
| I. BACKGROUND..... | 9 |
| A. Survey Objectives | 10 |
| B. Survey Methodology | 13 |
| II. DEMOGRAPHIC SEGMENTATION | 15 |
| #0. Geographic Distribution of Respondents | 16 |
| #1. Current Use of Molecular Biology Reagents..... | 18 |
| #14. Years Experience with Molecular Biology Techniques | 24 |
| #15. Segmentation by Organizational Type..... | 26 |
| III. MARKET SIZE | 29 |
| #1+. Size of Far East Market for Molecular Biology Kits | 30 |
| #2. Group Size Analysis..... | 34 |
| #C. Market Share Analysis Overview for All Kits | 36 |
| IV. MARKET ANALYSIS: THERMOSTABLE ENZYMES & KITS | 39 |
| #4. Thermostable Enzyme Market Analysis..... | 40 |
| #5. Thermostable Enzyme Applications | 54 |
| V. MARKET ANALYSIS: SEQUENCING KITS | 59 |
| #3. DNA Sequencing Kit Market Analysis | 60 |
| VI. MARKET ANALYSIS: NUCLEIC ACID LABELING KITS | 75 |
| #6. Nucleic Acid Labeling Kit Market Analysis | 76 |
| VII. MARKET ANALYSIS: VARIOUS COMMERCIAL KITS | 93 |
| #8. Molecular Biology Applications Currently Performed..... | 94 |
| #9. Various Other Commercial Kit Market Analysis | 96 |
| #10. Use of Reverse Transcriptase for cDNA Synthesis | 119 |
| #11. Applications Performed with Cloning Kits..... | 121 |
| VIII. MARKET ANALYSIS: RIBONUCLEASE PROTECTION ASSAYS | 123 |
| #7. Ribonuclease Protection Assay Market Analysis..... | 124 |
| IX. OVERVIEW | 129 |
| #D. Major Suppliers' Sales by Category..... | 130 |
| X. FUTURE EXPECTATIONS | 139 |
| #13. Suggested Improvements in Molecular Biology Kits..... | 140 |
| #12. Applications for Future Molecular Biology Kits | 144 |
| XII. THE QUESTIONNAIRE..... | 147 |

LIST OF TABLES & FIGURES

| | |
|--|-----------|
| I. BACKGROUND..... | 9 |
| Survey Objectives | 10 |
| Survey Methodology..... | 13 |
| Survey Response Rates..... | 13 |
| II. DEMOGRAPHIC SEGMENTATION | 15 |
| Geographic Segmentation for Names Used in Survey | 16 |
| Respondents' Geographic Distribution..... | 17 |
| Molecular Biology Reagent Usage, Among All Respondents..... | 18 |
| Verbatim Comments Regarding Reasons Behind Format Selection | 19 |
| Years of Experience, All Molecular Biology Reagent Users..... | 24 |
| Distribution by Type of Organization, Reagent Users | 26 |
| Distribution by Type of Organization, Kit Users Only..... | 27 |
| III. MARKET SIZE | 29 |
| Molecular Biology Reagent Usage, Among All Respondents..... | 30 |
| Popular'n Estimate of Far East Life Scientists Using Mol Bio Techniques | 31 |
| Molecular Biology Application Areas..... | 32 |
| Far East Population Estimates for Each Molecular Biology Techniques.... | 33 |
| Reported Group Size, Molecular Biology Reagent/Kit Users | 34 |
| Median Group Size, Molecular Biology Reagent/Kit Users..... | 35 |
| Unit Share by Kit Category, Installed Base of Mol Biology Reagents | 36 |
| Dollar Share by Kit Category, Installed Base of Mol Biology Reagents | 37 |
| IV. MARKET ANALYSIS: THERMOSTABLE ENZYMES & KITS | 39 |
| Mean Annual Consumption & Spend per Respondent, Enzymes & Kits . | 40 |
| Estimated Number of Laboratories/Workgroups Using Enzymes & Kits.. | 40 |
| Extrapolated Unit & Dollar Market Size Estimates, Enzymes & Kits | 40 |
| Consumption of Thermostable Enzymes, Separate Enzymes vs. Kits | 41 |
| Dollar Spend on Thermostable Enzymes, Separate Enzymes vs. Kits | 42 |
| Annual Far East Market Size Estimates, Thermostable Enzymes & Kits ... | 42 |
| Forecast Growth for Thermostable Enzymes, Separate Enzymes vs. Kits .. | 43 |
| Annual Far East \$ Market Size Projections, Enzymes & Kits | 43 |
| Unit Market Share for Major Suppliers, Thermostable Enzymes & Kits... | 44 |
| Dollar Market Share for Major Suppliers, Thermostable Enzymes & Kits | 45 |
| Mean Unit Prices for Thermostable Enzymes, by Supplier | 45 |
| Thermostable Enzymes Purchased Separately | 46 |
| Unit Market Share for Major Suppliers, Separate Thermostable Enzymes | 46 |
| Dollar Market Share for Major Suppliers, Sep. Thermostable Enzymes | 47 |
| Most Frequently Mentioned Thermostable Enzymes..... | 48 |
| Dollar Market Share for Major Suppliers, Taq-Related Enzymes | 48 |
| Thermostable Enzymes in Kits | 49 |
| Unit Market Share for Major Suppliers, Amplification Kits..... | 49 |

| | |
|--|-----------|
| Dollar Market Share for Major Suppliers, Amplification Kits | 50 |
| Most Frequently Mentioned Kits of Thermostable Enzymes | 50 |
| Dollar Market Shares for Major Suppliers of Enzymes & Kits, Japan | 51 |
| Dollar Market Shares for Major Suppliers of Enzymes & Kits, Oceania ... | 52 |
| Dollar Market Shares for Major Suppliers of Enzymes & Kits, Other | 52 |
| Dollar Market Size Estimates for Major Suppliers of Enzymes & Kits | 53 |
| Verbatim Comments Regarding Thermostable Enzyme Applications | 54 |
| Frequency of Mentions for Thermostable Enzyme Applications | 58 |
| V. MARKET ANALYSIS: SEQUENCING KITS | 59 |
| Mean Annual Consumption & Spend per Respondent, Sequencing Kits.. | 60 |
| Estimated Number of Laboratories/Workgroups Using Sequencing Kits.. | 60 |
| Extrapolated Unit & Dollar Market Size Estimates, Sequencing Kits | 60 |
| Unit Market Share for Sequencing Kits, Manual vs. Automated | 61 |
| Dollar Market Share for Sequencing Kits, Manual vs. Automated | 61 |
| Annual Far East Market Size Estimates for Sequencing Kits, by Type..... | 62 |
| Forecast Growth for Sequencing Kit Use, by Type | 63 |
| Weighted Average Forecast Growth Rate for Sequencing Kits, by Type.... | 64 |
| Annual Far East \$ Market Size Projections for Sequencing Kits, by Type . | 64 |
| Unit Market Share for Major Suppliers, All Sequencing Kits | 64 |
| Dollar Market Share for Major Suppliers, All Sequencing Kits | 65 |
| Mean Reported Prices for Sequencing Kits, by Type & Supplier | 66 |
| Automated Sequencing Kits | 66 |
| Unit Market Share for Major Suppliers, Automated Sequencing Kits | 67 |
| Dollar Market Share for Major Suppliers, Automated Sequencing Kits | 67 |
| Manual Isotopic Sequencing Kits | 68 |
| Unit Market Share for Major Suppliers, Manual Isotopic Kits..... | 68 |
| Dollar Market Share for Major Suppliers, Manual Isotopic Kits | 69 |
| Manual Nonisotopic Sequencing Kits | 69 |
| Unit Share for Major Suppliers, Manual Nonisotopic Kits | 70 |
| Dollar Share for Major Suppliers, Manual Nonisotopic Kits | 70 |
| Far East \$ Market Size Estimates for Sequencing Kit Suppliers..... | 71 |
| Dollar Market Shares for Major Suppliers of Sequencing Kits, Japan..... | 72 |
| Dollar Market Shares for Major Suppliers of Sequencing Kits, Oceania.... | 72 |
| Dollar Market Shares for Major Suppliers of Sequencing Kits, Other..... | 73 |
| VI. MARKET ANALYSIS: NUCLEIC ACID LABELING KITS | 75 |
| Average Annual Consumption & Spend per Respondent, Labeling Kits... | 76 |
| Extrapolated Unit & Dollar Market Size Estimates for Labeling Kits | 76 |
| Unit Market Share for Nucleic Acid Labeling Kits, by Type..... | 77 |
| Dollar Market Share for Nucleic Acid Labeling Kits, by Type | 77 |
| Annual Far East Market Size Estimates for Labeling Kits, by Type | 78 |
| Forecast Growth for Nucleic Acid Labeling Kit Use | 79 |
| Weighted Average Forecast Growth Rate, Nucleic Acid Labeling Kits | 79 |
| Annual Far East \$ Market Size Projections for Labeling Kits, by Type..... | 80 |
| Unit Market Share for Major Suppliers, All Nucleic Acid Labeling Kits .. | 80 |

| | |
|--|------------|
| Dollar Market Share for Major Suppliers, All Nucleic Acid Labeling Kits | 81 |
| Mean Reported Prices for Nucleic Acid Labeling Kits, by Supplier..... | 82 |
| Random Primer Labeling Kits..... | 82 |
| Annual Unit & \$ Market Size Estimates, Random Primer Labeling Kits .. | 82 |
| Unit Market Share for Major Suppliers, Random Primer Labeling Kits.... | 83 |
| Dollar Market Share for Major Suppliers, Random Primer Labeling Kits . | 83 |
| Most Frequently Mentioned Kits for Random Primer Labeling..... | 84 |
| 5- End Labeling Kits..... | 84 |
| Annual Unit & Dollar Market Size Estimates, 5' End Labeling Kits..... | 84 |
| Unit Share for Major Suppliers, 5' End Labeling Kits..... | 85 |
| Dollar Share for Major Suppliers, 5' End Labeling Kits | 85 |
| Most Frequently Mentioned Kits for 5' End Labeling | 86 |
| in Vitro Transcription Labeling Kits..... | 86 |
| Annual Unit & \$ Market Size Estimates, in Vitro Transcription Kits..... | 86 |
| Unit Market Share for Major Suppliers, in Vitro Transcription Kits | 86 |
| Most Frequently Mentioned Kits for in Vitro Transcription Labeling | 86 |
| Dollar Market Share for Major Suppliers, in Vitro Transcription Kits..... | 87 |
| Nick Translation Labeling Kits | 87 |
| Annual Unit & \$ Market Size Estimates, Nick Translation Labeling Kits. | 87 |
| Unit Market Share for Major Suppliers, Nick Translation Kits | 88 |
| Dollar Market Share for Major Suppliers, Nick Translation Kits..... | 88 |
| Kits for the Direct Enzyme Labeling of Oligos..... | 89 |
| Annual Unit & \$ Market Size Estimates, Direct Enzyme Labeling Kits | 89 |
| Unit Market Share for Major Suppliers, Direct Enz Labeling of Oligos.... | 89 |
| Dollar Market Share for Major Suppliers, Direct Enz Labeling of Oligos . | 90 |
| Dollar Market Shares for Major Suppliers of Labeling Kits, Japan..... | 90 |
| Dollar Market Shares for Major Suppliers of Labeling Kits, Oceania..... | 91 |
| Dollar Shares for Major Suppliers of Labeling Kits, Other Countries | 92 |
| Far East Sales \$ Market Size Estimates for NA Labeling Kit Suppliers..... | 92 |
| VII. MARKET ANALYSIS: VARIOUS COMMERCIAL KITS | 93 |
| Current Molecular Biology Applications, Share of Mentions..... | 94 |
| Population Size Estimates for Various Mol Biology Applications | 95 |
| Unit Market Share by Kit Category, Various Commercial Kits..... | 96 |
| Dollar Market Share by Kit Category, Various Commercial Kits..... | 97 |
| Summary of Various Commercial Kits, Installed Base Audit | 97 |
| Annual Far East Market Size Estimates for Various Kits, by Type | 98 |
| Forecast Growth for RT-PCR Kits | 99 |
| Forecast Growth for cDNA Synthesis & Cloning Kits..... | 99 |
| Forecast Growth for Transfection Kits..... | 100 |
| Forecast Growth for Genotyping & Translation Kits..... | 101 |
| Weighted Average Forecast Growth Rate, Various Kits by Type..... | 101 |
| Annual Far East \$ Market Size Projections for Various Kits, by Type..... | 102 |
| RT-PCR Labeling Kits | 102 |
| Unit Market Share for Major Suppliers, RT-PCR Kits | 102 |

| | |
|--|-----|
| Dollar Market Share for Major Suppliers, RT-PCR Kits | 103 |
| Adjusted Dollar Market Share for Major Suppliers, RT-PCR Kits..... | 103 |
| Mean Reported Prices for RT-PCR Kits, by Supplier | 104 |
| Most Frequently Mentioned RT-PCR Kits..... | 105 |
| Dollar Market Share for Major Suppliers, RT-PCR Kits, Japan..... | 106 |
| Dollar Market Share for Major Suppliers, RT-PCR Kits, Oceania..... | 106 |
| Dollar Market Share for Major Suppliers, RT-PCR Kits, All Others | 107 |
| cDNA Synthesis & Cloning Kits | 107 |
| Annual Far East Market Size Estimates, cDNA Synthesis/Cloning Kits | 107 |
| Unit Market Share for Major Suppliers, cDNA Synthesis/Cloning Kits ... | 108 |
| Dollar Market Share for Major Suppliers, cDNA Synthesis/Cloning Kits . | 108 |
| Mean Reported Prices for cDNA Synthesis/Cloning Kits, by Supplier | 109 |
| Most Frequently Mentioned cDNA Synthesis/Cloning Kits | 109 |
| Dollar Market Share for Major Suppliers of cDNA Kits, Japan | 110 |
| Dollar Market Share for Major Suppliers of cDNA Kits, Oceania | 111 |
| Dollar Market Share for Major Suppliers of cDNA Kits, Other Countries | 111 |
| Transfection Kits | 112 |
| Annual Far East Market Size Estimates, Transfection Kits | 112 |
| Unit Share for Major Suppliers, Transfection Kits..... | 112 |
| Dollar Share for Major Suppliers, Transfection Kits | 113 |
| Mean Reported Prices for Transfection Kits, by Supplier | 113 |
| Most Frequently Mentioned Transfection Kits | 114 |
| Genotyping/Fingerprinting Kits | 114 |
| Unit Market Share for Major Suppliers, Genotyping/Fingerprinting Kits. . | 114 |
| \$ Market Share for Major Suppliers, Genotyping/Fingerprinting Kits | 115 |
| Mean Reported Prices for Genotyping/Fingerprinting Kits, by Supplier... | 115 |
| in Vitro Translation Kits | 115 |
| Annual Far East Market Size Estimates, in Vitro Translation Kits | 115 |
| Unit Market Share for Major Suppliers, in Vitro Translation Kits..... | 116 |
| Dollar Market Share for Major Suppliers, in Vitro Translation Kits | 116 |
| Mean Reported Prices for in Vitro Translation Kits, by Supplier..... | 117 |
| Dollar Market Size Estimates for Major Suppliers of Various Com'l Kits . | 118 |
| Use of Reverse Transcriptase for cDNA Synthesis, Share of Mentions..... | 119 |
| Applications Currently Performed with Cloning Kits | 121 |
| VIII. MARKET ANALYSIS: RIBONUCLEASE PROTECTION ASSAYS | 123 |
| Average Annual Consumption & Spend/Respondent, Ribonuc Protect'n. . | 124 |
| Extrapolated Unit & \$ Market Size Estimates, Ribonuc Protect'n Assays . | 124 |
| Forecast Growth for Ribonuclease Protection Assay Kits | 125 |
| Annual Far East \$ Market Size Projections, Ribonuc Protect'n Assays | 125 |
| Unit Market Share for Major Suppliers, Ribonuc Protect'n Assays | 126 |
| Dollar Market Share for Major Suppliers, Ribonuc Protect'n Assays | 126 |
| Mean Reported Price for Ribonuc Protect'n Assays, by Supplier | 127 |
| Most Frequently Mentioned Ribonuclease Protection Assay Kits..... | 127 |
| \$ Market Size Estimates for Major Ribonuc Protect'n Assay Suppliers..... | 127 |

| | |
|--|-----|
| 1X. OVERVIEW | 129 |
| Annual Far East \$ Market Size Projections, All Molecular Biology Kits.... | 130 |
| Dollar Market for Molecular Biology Kits by Category for All Suppliers.. | 131 |
| Perkin-Elmer Dollar Market Share for All Kits by Category | 132 |
| Takara Dollar Market Share for All Kits by Category | 132 |
| Promega Dollar Market Share for All Kits by Category | 133 |
| Amersham Dollar Market Share for All Kits by Category | 134 |
| Boehringer Mannheim Dollar Market Share for All Kits by Category..... | 134 |
| Life Technologies Dollar Market Share for All Kits by Category..... | 135 |
| Stratagene Dollar Market Share for All Kits by Category | 135 |
| Pharmacia Dollar Market Share for All Kits by Category..... | 136 |
| Clontech Dollar Market Share for All Kits by Category | 137 |
| Overall Dollar Market Share for All Suppliers | 137 |
| X. FUTURE EXPECTATIONS | 139 |
| Suggested Improvements in Molecular Biology Kits | 140 |
| Verbatim Comments Regarding New Applications..... | 144 |
| X1. THE QUESTIONNAIRE | 147 |