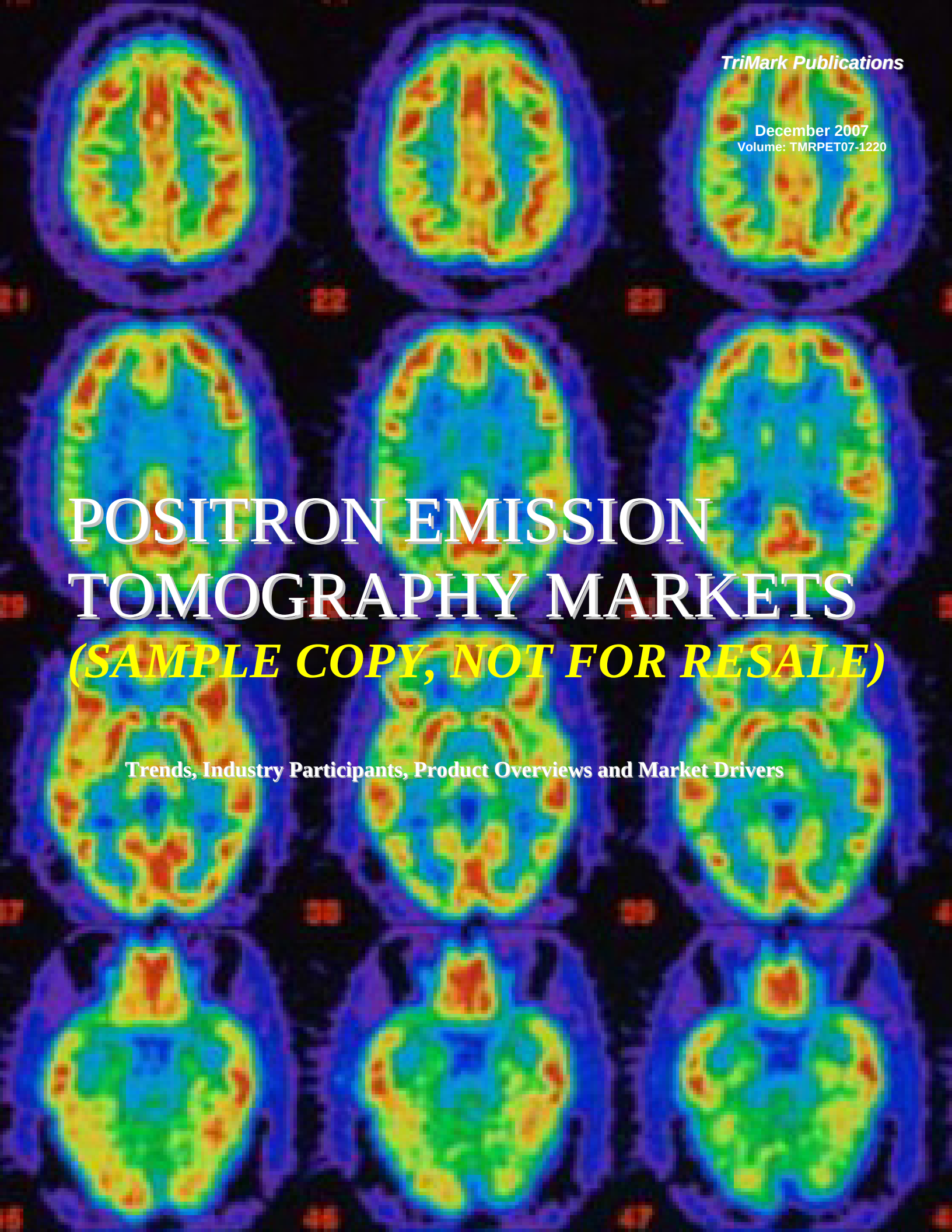

TriMark Publications

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POSITRON EMISSION TOMOGRAPHY MARKETS

(SAMPLE COPY, NOT FOR RESALE)

Trends, Industry Participants, Product Overviews and Market Drivers

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1 Overview

1.1 Statement of Report

The purpose of this study is to describe the specific market segment of the diagnostic medical imaging market called positron emission tomography (PET) scanning. PET scanning is a technique used in combination with small amounts of radio-labeled compounds to visualize the anatomy and function of the brain and other organs. The PET scanning sector includes all of the generally accepted imaging activities that are currently used, including equipment for PET, PET/CT, SPECT and the use of radiopharmaceuticals for imaging. This study examines these clinical measurement devices and their reagents and supplies as used in hospitals and clinics. It also reviews associated clinical market segments in which PET scanning has taken a prominent role, including cancer treatment, cardiology and neurology imaging markets.

1.2 Scope of this Report

The main objectives of this report are to:

- Identify viable technology drivers through a comprehensive look at various platform technologies for PET.
- Obtain a complete understanding of the use of PET—predictive, screening, prognostic, diagnostic and monitoring—from its basic principles to its applications.
- Discover feasible market opportunities by identification of high-growth applications in different imaging areas, with a focus on the biggest and expanding markets for PET.
- Focus on global industry development of PET through an in-depth analysis of the major world markets for medical imaging, including forecasts for growth.
- Establish the essentials of the PET imaging market including definitions, processes and trends.

Market figures regarding the current value of the medical imaging market are taken from the most recently available data of the global medical products industry. This report covers the following categories of medical imaging:

- PET.
- PET/CT (computed tomography) combinations.
- SPECT (single-photon emission computed tomography).
- Radiopharmaceutical imaging.

Analysis of PET scanning includes the use of charts and graphs measuring product growth and trends within the marketplace. In addition, a discussion of research into the medical imaging arena provides the reader with a deeper understanding of the possibilities for future treatment and avenues for possible R&D budgets. Company-specific information, including sales figures, product pipeline status, and research and development trends, is provided throughout the report. The study will:

- Assess the PET market drivers and bottlenecks, from the perspective of the medical and scientific communities.
- Discuss the potential benefits of the PET market for various sectors of the medical and scientific community.
- Establish the current total market size and future growth of the PET market and analyze the current size and growth of various segments.
- Provide current and forecasted market shares by company.
- Discuss profit/business opportunities by imaging segment.
- Provide strategic recommendations for near-term business opportunities.
- Assess current commercial uses of the PET technology platforms.
- Review the PET business models.

PET products consist of hardware, software and supplies used to create, view and manage visual images of non-visible organs of the human body for purposes of research, diagnosis and guidance of non-invasive surgery. This report will focus on end-user markets including hospitals, research facilities, freestanding clinics and equipment-leasing companies.

In the past few years, several multimodal products have been developed in an attempt to combine the advantages of structural and functional imaging. Multimodal combinations discussed in this study include:

- CT/SPECT units.
- CT/PET units.

The emphasis in this analysis is on those companies that are actively developing and marketing PET technologies. The reader should consult other TriMark Publications reports at http://www.trimarkpublications.com for a detailed discussion of the other important individual market segments that are related to the medical imaging markets, such as X-ray and radiography, mammography, magnetic resonance imaging (MRI), ultrasound, gamma camera market, computed tomography (CT) scans, and picture archiving and communication systems (PACS).

This report concentrates on the medical imaging market segment in important worldwide markets such as the United States, Japan and Europe. It focuses primarily on the hospital market segment, and, separately, on a description of the instruments, reagents and supplies marketed by major companies in the PET segment. The analysis discusses the market size, growth rates and market components for instruments and reagents, controls and consumables used in PET, with mention of contrast media and biopharmaceuticals used to enhance imaging resolution. This study reviews the market for medical imaging in the clinical and research hospital market. It defines the dollar volume of sales of the market, both worldwide and in the U.S., and analyzes the factors that influence the size and the growth of the market segments.

The report discusses activity and trends in the PET market and goes on to discuss in detail the trends that have stimulated this market. This analysis also comments on the patterns of information processing in the PET market. It surveys all of the companies known to be marketing, manufacturing or developing PET equipment in the U.S. and worldwide. Leading companies are discussed in depth with a section on the history of the company, the product line, business and marketing analysis, and a subjective commentary of the position of the company in its market.

1.3 Methodology

The information in this study is based on interviews with sales and marketing professionals of companies in the medical imaging market. People from virtually every company mentioned were queried, some several times, about their companies' products and marketing strategies as well as their overall thoughts about their industry segment. Information was also obtained from interviews with founders, chief executive officers and vice presidents of some of the companies discussed in the report. The structure of the hospital laboratories and patient facilities was derived from interviews with laboratory directors and technologists working in these areas.

Sources of information for the study were trade association publications and meetings, product brochures and catalogs and company literature. When the companies under discussion were publicly held, an examination of the annual reports, 10k filings and financial reports were used as the basis of the data reported. Important data sources include the Health for All Database of the World Health Organization (WHO), data published by the statistical office of the European Communities (Eurostat), as well as various health data from the United Nations and the Organization for Economic Cooperation and Development. When possible and practicable, the most recent data available have been used.

The author of this report has a Ph.D. in biochemistry with many decades of experience in science writing and as a medical industry analyst. The senior editor is a doctoral level clinical scientist. He has over 30 years of experience in laboratory testing and instrument and reagent development technology, as well as extensive experience in senior level positions in biotech and medical service companies. The consulting editor of this report is a licensed M.D. radiologist with considerable clinical experience and several years as an analyst in the imaging sector.

Some of the statistical information was taken from Biotechnology Associates' databases and from TriMark's private data stores. The information set forth in this study was obtained from sources that we believe to be reliable, but we do not guarantee the accuracy, adequacy or completeness of any information, omission or for the results obtained by the use of such information.

Primary Sources—TriMark collects information from hundreds of database tables and many comprehensive multi-client research projects and Sector Snapshots that we publish annually. We extract relevant data and analytics from TriMark's research of the past three years as part of this data collection. We also extract qualified data feeds from e-questionnaire responses and primary research responses for this compilation.

Secondary Sources—TriMark uses research publications, journals, magazines, newspapers, newsletters, Industry reports, Investment Research reports, Trade & Industry Association reports, government-affiliated trade releases and other published information as part of our secondary research materials.

The information is then analyzed and translated by the Industry Research Group into a TriMark study. The Editorial Group reviews the complete package with product and market forecasts, critical industry trends, threats and opportunities, competitive strategies and market share determinations. The report conclusions are verified through intensive interviewing of top ranking companies in the industry.

TriMark Publications Report Research and Data Acquisition Structure

The general sequence of research and analysis activity prior to the publication of every report includes the following items:

- Completing an extensive secondary research effort on an important market sector, including gathering all relevant information from corporate reporting, publicly available databases, proprietary databases, direct meetings and personal interviews with key personnel.

- Formulating a study outline with the assigned writer, including important items:

    - Market and Product Segment grouping and evaluation of their relative significance.
    - Key Competitor Evaluations including their relative positions in the business and other relevant facts to prioritize diligence levels and assist in designing a primary research strategy.
    - End-User Research to evaluate analytical significance in market estimation.
    - Supply Chain Research and Analysis to identify any factors affecting the market.
    - New technology platforms and cutting edge applications.

- Identifying the key technology and market trends that drive or affect these markets. Assessing the regional significance for each product and market segment for proper emphasis of further regional/national primary and secondary research.

- Launching a combination of primary research activities including two levels of questionnaires, executive-direct focused, company-specific, and region-specific communications to qualified and experienced senior executives worldwide.

- Completing a confirmatory primary research assessment of the report's findings with the assistance of Expert Panel Partners from the industry being analyzed.

1.4 Executive Summary

There will be a steady increase in demand for PET services as resolution improves and PET is combined with other modalities like CT. The medical imaging segments are poised for a major new phase of growth fueled by the availability of new technology coming out of the computer and digital information technology segment. Continuous improvements in technology are resulting in a growing number of new imaging tests that combine high levels of accuracy with rapid, easy-to-use product formats. Another major driver is the high interest of individual older baby boom patients and general healthcare consumers to monitor health status. Competition in the development and marketing of PET products is intense, and these diagnostic technologies have been subject to rapid change. We estimate that the competitive factors in the PET market include resolution, price and product performance as well as the distribution, advertising, promotion and brand-name recognition of the marketer. There are relatively few large, dominant global players selling PET equipment; these are matched by many small companies with a few or one

product aiming at niche markets. A relative handful of firms—led by GE Medical Systems, Philips Medical Systems International BV and Siemens Medical Solutions—dominate the world medical imaging equipment market. However, due to the broad technology underlying the various forms of medical imaging, there are many companies that perform very well in this sector, such as:

- Carestream Health, Inc. (U.S.).
- Fonar Corporation (U.S.).
- Hitachi Medical Systems America, Inc. (U.S.).
- Hologic, Inc. (U.S.).
- Medison America, Inc. (U.S.).
- The Esaote Group (Italy).
- TomTec Imaging Systems GmbH (Germany).
- Toshiba America Medical Systems (U.S.).

TriMark expects across-the-board growth by equipment type (*e.g.*, conventional and filmless X-ray/radiography, ultrasound, MRI, CT scanning, nuclear medicine and PET); and by market (*e.g.*, hospitals, outpatient facilities, physician's offices, home healthcare, dental offices, veterinarian's offices and educational).

Worldwide diagnostic and therapeutic medical imaging constitutes a $[redacted] market, estimated to achieve gains between [redacted]% and [redacted]% per year through [redacted], to over $[redacted], with consistent growth in the double digits for many sectors. The market for medical imaging tests in the U.S. is estimated to be growing at [redacted]% per year through [redacted], reaching over $[redacted] by that time. Two test categories, X-ray and mammography, dominate this market in terms of volume of procedures, and account for approximately [redacted]% and [redacted]% of the total medical imaging worldwide market, respectively.

We see significant opportunities to grow the medical imaging business outside the U.S. Specifically, European medical imaging procedures increased [redacted]% over the prior year. We expect that the expanded role of women's health organizations will play a critical role in the further commercialization of mammography screening. From a market perspective, unit sales of PET scanners are increasing among large hospitals, medical centers and community facilities. The number of procedures being performed is also growing. With respect to system options, bismuth germinate is being complemented with other types of crystal materials. Another interesting development is greater availability of hybrid CT/PET scanners. Estimates of total market revenues could reach over $[redacted] by [redacted].

U.S. PET sales were $[redacted] and worldwide sales were $[redacted] in [redacted]. Industry analysts estimate that [redacted] clinical PET patient studies were performed in the U.S. in [redacted], using dedicated PET/CT or PET scanners, mobile PET/CT or PET scanners, or nuclear medicine cameras with coincidence detection. Studies were performed in [redacted] sites, composed of [redacted]% hospital and [redacted]% non-hospital facilities. The demand for PET scanning continued to grow at an increase of [redacted]% per year. By [redacted], PET procedure volume is expected to increase to [redacted] procedures, for an overall five year compound annual growth rate (CAGR) of [redacted]%.

PET has become more accessible to a wider base of physicians and patients, increasing the referral base. This has stimulated sales of fluoro-deoxy-D-glucose (FDG), while reducing the cost per dose. By [redacted], FDG sales were $[redacted]. These sales should reach $[redacted] by [redacted], notwithstanding the diminishing price per dose for FDG.

