New Telomerase PCR ELISA Offers Simplified, Nonradioactive TRAP Assay for Measuring Telomerase, A Potential Marker for Cancer Research

Boehringer Mannheim is now offering a Telomerase PCR ELISA for the highly sensitive, nonradioactive detection of telomerase activity in extracts from cell cultures and tissue samples.

Telomerase as an important parameter in cancer research

Telomeres, the specialized DNA/protein structures at the end of eukaryotic chromosomes, contain tandemly repeated DNA sequences that are believed to protect genomic DNA from degradation and deleterious recombination events. During normal somatic cell proliferation, telomeric ends are progressively shortened with each replication cycle, which may play a role in limiting the proliferative capacity of normal cells. Germline cells, many tumor cells, and “immortalized” cell lines are believed to circumvent this telomere shortening using telomerase, a ribonucleoprotein that adds new repeats to the ends of chromosomes. Telomerase activity has recently been identified in many cancers (e.g., prostate cancers [1], advanced-stage breast cancers [2], neuroblastomas [3], and primary lung cancer tissues [4]) that have been confirmed by other methods (e.g., histochemical staining). Thus, telomerase reactivation may allow cells to escape from the proliferative limitations of cellular senescence and could be further investigated as a potential marker for the development of malignant tumor cells.

Telomerase PCR ELISA improves upon previous TRAP assays

Telomerase activity is most frequently detected by the Telometric Repeat Amplification Protocol (TRAP) of Kim et al. (3), in which the telomerase-reaction product is amplified by PCR. However, the conventional TRAP assay achieves full sensitivity only when performed with a hazardous radioactive label, and visualization of results requires time-consuming gel electrophoresis and autoradiography. The new Telomerase PCR ELISA combines a one-step one-tube TRAP assay with nonradioactive detection in a highly sensitive photometric ELISA (Figure 1).

Easy-to-use ELISA delivers results in less time

The Telomerase PCR ELISA delivers results within 6 hours, eliminating the need for laborious, time-consuming gel electrophoresis and autoradiography techniques. Its ready-to-use TRAP reaction mix (telomerase substrate, amplification primers, nucleotides, Taq DNA polymerase, reaction buffer) eliminates the need to prepare multiple solutions and minimizes the risk of assay failure caused by contamination. Up to 96 TRAP reactions can be simultaneously analyzed with an ELISA plate reader.

Sensitive results correspond closely with those of radioactive TRAP assays

Besides avoiding the use of hazardous radioisotopes, the Telomerase PCR ELISA produces sensitive results comparable to those of the radioisotopic TRAP assay (Figure 2). The kit’s optimized detection probe and hybridization conditions maximize both specificity and sensitivity.

Additionally, optimized primer sequences eliminate the need for “hot start” PCR while avoiding amplification artifacts (e.g., primer dimers).

The Telomerase PCR ELISA is currently available

The Telomerase PCR ELISA (96 tests; Cat. No. 1 854 666) is now available from Boehringer Mannheim Biochemicals representatives. Additional information can also be found at http://biochem.boehringer-mannheim.com.

References:

*Licensed from Genor Corporation. Patents pending.

"Purchase of this product is accompanied by a limited license to use it in the Polymerase Chain Reaction (PCR) process in conjunction with a thermal cycler whose use in the automated performance of the PCR process is covered by the up-front license fee, either by payment to Perkin-Elmer or as purchased, i.e., an authorized thermal cycler.

Helping biomedical research become medical practice.
LATE-BREAKING RESEARCH SESSION
AT THE AACR ANNUAL MEETING
Tuesday, April 15, 1997

Time has been set aside for the presentation of 4-5 definitive reports of highly significant and timely findings in the field. Criteria for the selection of these presentations and instructions for submission of abstracts are as follows:

INSTRUCTIONS FOR SUBMISSION OF LATE-BREAKING ABSTRACTS

1. The work to be presented must be of major novelty and significance, e.g., the characterization of a new gene in familial cancer or the discovery of a new diagnostic marker, and should not have been previously published in a peer-reviewed scientific journal or presented at a national meeting.

2. The abstract must be sponsored by an AACR member in good standing (dues paid for 1997).

3. Each member in good standing may sponsor only one abstract for this session whether or not he or she sponsored an abstract last November for the regular annual meeting program. If an associate member is the sponsor, the abstract must also be endorsed by an active or corresponding member in good standing. In this case, the endorser does not forfeit the opportunity to sponsor a late-breaking abstract.

4. Abstracts must be typed on one side of one sheet of white paper.

5. All text on the page must fit within an area 6 1/2" wide and 9" high (16.5 cm x 22.9 cm) with margins of at least 1" (2.5 cm) on the top, bottom, and sides of the page.

6. Each abstract must be accompanied by a covering letter from the sponsor explaining why the work is novel and significant enough to be considered for this late-breaking research session and certifying that the findings became available after the annual meeting abstract deadline of November 12, 1996. This letter must contain the sponsor's complete mailing address, FAX number, and E-mail address (if available) so that we can communicate the scheduling decision of the Program Committee.

7. Abstracts and covering letters must be received in the AACR Office by 5:00 p.m. Eastern Time on March 7, 1997. FAX transmissions are not acceptable. Carrying envelopes should be clearly marked "Late-Breaking Abstract." and should be addressed to American Association for Cancer Research, Public Ledger Building, Suite 816, 150 South Independence Mall West, Philadelphia, PA 19106-3483. If you wish to receive acknowledgment of receipt of your abstract, enclose a self-addressed post card with appropriate postage affixed. Accepted abstracts will not be published since they will be received after the Proceedings of the American Association for Cancer Research has been printed; however, they will be distributed at the session in San Diego.

8. A special subcommittee of the Program Committee appointed by President Louise C. Strong will select the papers to be presented. Presenters of accepted papers will be notified via FAX no later than March 24, 1997.
The Journal of Clinical Investigation: Seven Decades of Biomedical Science

Friday, April 25, 1997, Washington, D.C.
9:00 a.m. - 5:00 p.m.

A satellite symposium of the Biomedicine '97 Meeting

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Ajit Varki (Editor 1992-95)
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OTHER FEATURED SPEAKERS INCLUDE
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Bernard Babior, Scripps Research Institute
Barry Brenner, Harvard Medical School
Michael Brown, Univ. of Texas Southwestern
Desiré Collen, Univ. of Leuven
Jesse Roth, Johns Hopkins University
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Registration is free but required for all attendees. To register, send an e-mail message to <MC1@ucsd.edu>, providing your full name, institutional address, telephone and FAX numbers. If you do not have e-mail, please send a FAX to Arline Allen, 619.455.7880.
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Cancer of the Central Nervous System

June 7-11, 1997
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Novel Therapies
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ADDITIONAL SPEAKERS TO BE ANNOUNCED

Application Deadline: March 14, 1997

Information and Application Forms:
American Association for Cancer Research
Public Ledger Building, Suite 816
150 South Independence Mall West
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Featured on this issue's cover is Louise C. Strong, President of the American Association for Cancer Research (AACR) for 1996–97. She currently holds the Sue and Radcliffe Killam Chair as Professor of Human Genetics in the Division of Pediatrics at the University of Texas M.D. Anderson Cancer Center, Houston, TX, where she has spent her academic career.

Dr. Strong has had a long-standing interest in the genetics of human cancer, specifically studying models for genetic predisposition to cancer and their implications for the more common nonhereditary cancer. Her approach has been multidisciplinary, using clinical and genetic epidemiological studies of patient populations to generate hypotheses that can be tested in collaboration with cellular and molecular geneticists. Her major contributions have been in studies of the childhood cancers retinoblastoma and Wilms' tumor and childhood sarcoma.

Her interest in childhood cancer genetics originated with her postdoctoral work with Alfred G. Knudson, Jr., in extending his two-hit model of retinoblastoma to other tumor types, including Wilms' tumor of the kidney. She subsequently demonstrated that the "two hits" might involve loss of genetic information and implied loss of function, based on inherited chromosome deletions and tumor-specific loss of heterozygosity in retinoblastoma. Retinoblastoma, which has exhibited a high cure rate since the 1940s, also provided a model for study of long-term survivors and risks for second tumors, yielding evidence that radiation-related and spontaneous second tumors were uniquely high in the heritable subgroup. This model, in which the second cancers occur primarily in those with an underlying genetic susceptibility and in which there may be a short latency for radiation-related tumors of the type to which the individual is predisposed, may be generalized to nevoid basal cell carcinoma syndrome and to soft tissue sarcoma survivors.

Dr. Strong continued to pursue her interest in the genetics of Wilms' tumor in collaboration with Grady F. Saunders, Vicki Huff, and coworkers, leading to the fine mapping of the 11p13 Wilms' tumor gene WT1, molecular confirmation of the two-hit model for WT1, and demonstration of heterogeneity in "hereditary" Wilms' tumor with evidence that familial predisposition did not necessarily segregate with WT1. Further molecular analysis of Wilms' tumor revealed parental bias in the origin of the tumor-specific loss of heterozygosity, with nonrandom loss of 11p paternal alleles, suggestive of genomic imprinting.

The multidisciplinary approach to cancer genetics is probably best evidenced by the studies of childhood sarcoma and Li-Fraumeni syndrome. These genetic epidemiological studies provided analytical evidence that cancer aggregation in families of childhood sarcoma, ascertained from a systematic study, might be attributable to an autosomal dominant gene and provided estimates of the gene penetrance and frequency. In collaboration with Michael A. Tainsky, Dr. Strong contributed to cellular studies of fibroblasts from individuals from the highest-risk families, demonstrating reproducible spontaneous immortalization and cooperation with mutant ras in tumorigenesis. These data, combined with the broad spectrum of tumors observed in the families, provided rationale for the molecular studies, conducted in collaboration with Frederick P. Li, of the tumor suppressor gene p53 in the high-risk kindreds that led to the finding of the germ-line mutations in p53 in Stephen H. Friend's laboratory. The fibroblasts have continued to provide an important model for studying the role of p53 in cell cycle regulation and genomic instability, and follow-up of the cancer-prone families continues to provide new insights into the molecular mechanisms of tumorigenesis. The ability to identify a cancer susceptibility gene of high penetrance for cancer overall but variable for age and site presents new ethical dilemmas regarding risks and benefits of genetic testing yet offers unique potential for early tumor detection and prevention.

Dr. Strong received her B.A. in Mathematics from the University of Texas at Austin in 1966 and her M.D. in Medicine in 1970 from the University of Texas Medical Branch. She is the 1997 Ashbel Smith Distinguished Alumna of the University of Texas Medical Branch at Galveston, and she was also awarded the Distinguished Texas Geneticist Award from the Texas Genetics Society for 1997. In addition to her research, she has served on many review groups and policy-making committees of the National Cancer Institute, including the National Cancer Advisory Board.

She has been an active member of the AACR since 1984. In addition to her service as AACR President, she is a member of the Board of Directors (1993–98) and the Executive Committee (1995–98; Chairperson: 1996–97). Her term as President has been noteworthy for her leadership of a strategic planning process conducted by the Board of Directors. As a result of these discussions, the AACR has embarked on an ambitious program to make the expertise of its members available to the lay public, government officials, cancer survivors, and the media. Dr. Strong has also served on the Finance Committee (1995–96) and on several Program Committees (1986; 1990; 1996) and Awards Committees, including chairing the 1994 Clowes Award Committee. Moreover, she has lent her expertise to the Association through her participation on the Editorial Boards of three AACR journals: she was an Associate Editor for Cancer Research from 1983–87 and 1993–94 and is currently an Associate Editor for Clinical Cancer Research (1994–) and a member of the Editorial Advisory Board of Cancer Epidemiology, Biomarkers & Prevention (1991–).

Sidney Weinhouse

1 Photograph by James A. Lemoine, BFA, Department of Graphics and Photography, University of Texas M.D. Anderson Cancer Center, Houston, TX.