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Critical Care Medicine: Technology and Patient Management
Proceedings of the Thirteenth Annual
Arnold O. Beckman Conference in Clinical Chemistry

Program Chairman: John H. Eckfeldt
Program Committee: Mary Burritt, David Bruns, and Frank Cerra
Program developed in cooperation with the Society of Critical Care Medicine

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. Content of Abstracts

The information in each abstract must include and clearly state:

a. the objective of the study
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NOTE: Relevant technical information cannot be withheld on the ground that such information is proprietary.

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d. Linearity data.
e. Precision data.
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g. Recovery data if extraction or prechromatography is used.
h. An interference study if a chromatographic procedure or immunoassay. The entire list of substances included in the interference study should not be stated in the abstract but must be given during the presentation at the meeting.

2. Abstract Form

Abstracts must be submitted on the official AACC Abstract Reproduction Form contained in the August and September issues of the AACC Journal. Additional forms may be obtained from the AACC Meeting Department, 2029 K Street, NW, Suite 700, Washington, DC 20006 USA, 800-892-1400, 202-857-0717, TLX: 251925 AACCUR, FAX: 202-887-5093.

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The name, address and phone number of the presenting author must be typed on the Abstract Reproduction Form, given first and underlined in the listing of authors in the abstract text. ALL correspondence concerning the abstract will be sent to the presenting author.

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☐ 1. Key Words: Indicate key words in three defined categories related to your paper topic. (See page 000 and sample abstract)

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1. Registration materials will be available in April 1991.

2. Anyone presenting a poster is required to register for the meeting and pay the appropriate fee.

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ATTENTION STUDENTS SEE PAGE 12A.
DEVELOPMENT OF A CEDIA™ PHENYTOIN ASSAY AND APPLICATION TO THE HITACHI® 704, Greg Marr, Sharon Horgan, Claudia Thio, Shannon Norenberg, Faegh Davoudzadeh, William Coty and Pyare Khanna (Microgenics Corp., Concord, CA 94520)

Using the CEDIA™ technology, we have developed a homogeneous immunoassay for measurement of phenytoin levels in serum which can be used in conjunction with automated clinical analyzers. In the CEDIA™ Phenyltoin method, the enzyme β-galactosidase has been split into two inactive fragments, a large fragment (EA) and a smaller polypeptide (ED), which can spontaneously recombine to form active enzyme. Phenytoin is covalently attached to each ED molecule so that binding by anti-phenytoin antibodies inhibits the reassociation of EA and ED fragments. The CEDIA™ Phenyltoin Assay is performed in an analyzer such as the Hitachi® 704 as follows: Sample (4 μL) is pipetted into a reaction cuvette, followed by 200 μL of Reagent 1 containing substrate and a preformed complex of anti-phenytoin antibody and ED-phenytoin conjugate. These reagents are mixed and incubated at 37°C for 5 min, and then 150 μL of Reagent 2 containing EA is added, and the incubation is continued at 37°C. Phenytoin present in the sample induces dissociation of the ED-antibody complex during the first step; the ED released is then free to combine with EA to form active β-galactosidase during the second incubation. The amount of β-galactosidase formed, which is linearly proportional to the phenytoin concentration in the sample, is determined as the rate of substrate hydrolysis measured at 415 nm during the time interval of 4 to 5 min after EA addition. The concentration of phenytoin in unknown samples is calculated automatically by comparison of the sample rates with the rates obtained with 0 and 400 μg/mL Phenyltoin Calibrators. Using this assay method, the following results were obtained: Intra-assay precision (n = 20): low control—4.35 ± 0.11 μg/mL (2.6% CV); mid-level control—14.4 ± 0.1 μg/mL (0.7% CV); high control—24.5 ± 0.14 μg/mL (0.6% CV). Sensitivity (least detectable dose; 2σ) was 0.1 μg/mL. Linearity and recovery studies produced results within ± 10% of the expected concentration. Patient correlation of reference methods (commercially-available homogeneous phenytoin EIA and fluorescent polarization [FP] methods) resulted in the following least-squares regression equations: CEDIA = 0.92-EIA - 0.9 μg/mL (r = 0.997; S.E.E. = 0.9 μg/mL; n = 58); CEDIA = 0.92-FP - 2.2 μg/mL (r = 0.995; S.E.E. = 1.1 μg/mL; n = 58). Interference studies indicate negligible effect (< 10% error at 10 μg phenytoin/mL) at concentrations of ≤ 400 mg hemoglobin/dL, ≤ 1000 mg triglycerides/dL and ≤ 20 mg bilirubin/dL. Cross-reactivity to phenytoin metabolites and major anti-epileptic drugs was ≤ 1%. Preliminary results indicate that the CEDIA™ Phenyltoin Assay can be adapted to other clinical analyzers, including the COBAS® B10. Thus the CEDIA™ Phenyltoin Assay is a rapid, simple and effective method for the fully-automated measurement of phenytoin concentration in human serum.
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Any student of a recognized undergraduate, graduate, or postdoctoral program in a field related to clinical chemistry (e.g. biochemistry, medical technology, analytical chemistry, pharmacology etc) is eligible. The student must be the presenting author. Only one poster will be permitted per student, however, the student may be listed as a co-author on other abstracts. Students who wish to enter must indicate so on the Abstract Reproduction Form. Only abstracts that are accepted by the Contributed Papers Committee will be considered for the Best Poster Contest. Upon acceptance, students must submit a letter from their advisor verifying their status. Students with abstracts accepted for both the Student Poster Contest and the regularly scheduled poster sessions must present their work at both sessions. The Student Poster Contest will be held during the Student Mixer on Monday, July 29, 1991 from 6–8 pm. Prizes will be awarded. Please contact the AACC Education Department at 800-892-1400 for more information.

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