

# SCIENTIFIC PROCEEDINGS

## 87th Annual Meeting of the American Association for Cancer Research

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### ABSTRACT

#3318 Monday, April 22, 1996

Return of elevated antimalignin antibody to normal indicates remission of breast cancer. Bogoch, S., Bogoch, E.S. *Foundation for Research on the Nervous System and Oncolab, 36 The Fenway, Boston MA 02215.*

After surgical treatment of breast cancer, no quantitative molecular determinations have been available to indicate whether remission has been achieved or whether chemotherapy or radiation is required. We have examined whether the concentration of antimalignin antibody in serum (AMAS) might be useful to detect persistent malignancy. AMAS is a highly specific IgM autoantibody against a 10,000 Dalton cancer cell peptide. This antibody is cytotoxic/cytostatic in vitro at picograms (femtomoles) per cancer cell. Because AMAS is elevated early in malignancy, its concentration is determined as an aid to differential diagnosis and in screening high risk patients. We now find in a study of 1,175 sera from patients with breast cancer and other breast disorders, that 1 month to 30 years after treatment, clinical remission of breast cancer is correlated with the return of elevated AMAS to normal values.



## **PROCEEDINGS**

# **The Biology and Genetics of Early Detection and Chemoprevention of Cancer**

October 6-10, 1999  
Sheraton Bal Harbour Beach Resort  
Bal Harbour, Florida

### *Conference Co-Chairpersons*

**DAVID SIDRANSKY**  
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## "Early Detection and Chemoprevention of Cancer"

### Early Detection of Human Cancer by the Concentration of Antimalignin Antibody:

Direct Evidence in 8,090 Individuals of a Specific Immune Response in Cancer  
Samuel Bogoch and Elenore Sade Bogoch, Foundation for Research on the Nervous System and Oncolab, Inc. 36 The Fenway, Boston MA 02215

Antimalignin antibody is an unusual cancer marker because its antigen, malignin, a 10K peptide, appears not in normals but only during malignant transformation, regardless of cell type, upon deglycosylation of a 250K membrane glycoprotein, 10B. The low normal concentration of the antibody in human serum, suggesting earlier exposure to the antigen, increases with age, still within normal limits, in a curve which parallels that of the increasing risk of cancer with age, -- and more so in high risk families (J Cell Biochem S19:172-185, 1994), -- and then increases markedly early in clinical cancer. It has now been determined that this antibody is extremely cytotoxic to cancer cells, active at picograms per cancer cell *in vitro*. Further, actuarial survival studies show that the concentration of the antibody relates to survival of human cancer patients: the greater the concentration, the longer the survival.

The structure of epitopes of malignin was determined by mass spectroscopy. 12 MER and 16 MER peptide epitopes were synthesized de novo, absent any glycoconjugates, and upon injection of these synthetic peptide epitopes into rabbits, antimalignin antibody was produced in abundance. This completes the rigorous circle of proof of the structure and function of both antigen and antibody; and a synthetic general (independent of cell type) cancer vaccine thereby has been produced.

To determine by direct evidence if there is a quantitative immune response in a substantial human population in any cancer (something to our knowledge not previously established) four laboratories determined blind over 20 years by quantitative immunoabsorption to the immobilized antigen the concentration of antimalignin antibody in serum (AMAS), in 1,175 breast disorders, inflammatory (Gp I, N=172), benign tumor (Gp II, N=238), and malignant tumor active (Gp III, N=379) and in clinical remission (Gp IV, N=386) randomized within 8,090 consecutive patients and controls including healthy controls (Gp V, N=4,425). AMAS was not increased compared to healthy controls (Gp V) in inflammatory (Gp I) nor in benign tumor (Gp II) (thus neither inflammation nor proliferation produce an increase), but increased in concentration two to five-fold in active malignancy, both first occurrence and recurrence (Gp III,  $p < 0.001$ ; at primary diagnosis, sensitivity was 98.2%, specificity 91.4%; at recurrence, sensitivity 96.2%, specificity 100%), and returned to normal in remission (Gp IV). AMAS elevation had similar sensitivity and specificity in malignancies other than breast, and usually preceded the elevation of CEA, CA19.9, CA125, PSA and CA15.3 (CA27:29). Its universality and elevation early in transformation make AMAS an ideal marker for chemoprevention studies.

*Keywords:* antimalignin antibody in serum; AMAS; human cancer; early detection; quantitative immune response; chemoprevention.