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The following is adapted from a presentation by Dr. Saul Green to the American Association for Clinical Chemistry Symposium, July 1997, Atlanta, GA.

Stanislaw Burzynski and Antineoplaston Therapy

By Saul Green, Ph.D.

Unlike other alternative medicine practitioners, Stanislaw R. Burzynski has published profusely. The sheer volume of his publications impresses patients, but unless they understand what they are reading, they cannot judge its validity. To a scientist, Burzynski's literature contains clear evidence that his data does not support his claims.

Burzynski's Background and Credentials

Burzynski received an M.D. from a medical academy in Poland in 1967 and a D.Msc. in 1968. He did not finish a residency or train in oncology, and his bibliography does not mention clinical cancer research, urine, or antineoplastons during this period.

Burzynski came to the United States in 1970 and worked in the department of anesthesiology at Baylor University, Houston, for three years, isolating peptides from rat brains. He got a license to practice medicine in 1973 and, with others, received a three-year grant to study the effect of urinary peptides on the growth of cancer cells in tissue culture. The grant was not renewed.

In 1976, with no preclinical or clinical cancer research experience, Burzynski announced a theory for the cure of cancer based on his assumption that spontaneous regression occurs because natural anticancer peptides, which he named *antineoplastons*, "normalize" cancer cells. Since urine contains lots of peptides, he concluded that there he would find antineoplastons. Less than one year later and based only on these assumptions, Burzynski used an extract from human urine ("antineoplaston A") to treat twenty-one cancer patients at a clinic he opened. His shingle read, "Stanislaw R. Burzynski, M.D., *Ph.D.*"

Burzynski's claim to a Ph.D. is questionable. Letters from the Ministry of Health, Warsaw, Poland, and from faculty at

the Medical Academy at Lubin, Poland, say, respectively:

1. At the time Burzynski was in school, medical schools did not give a Ph.D. [1].
2. Burzynski received the D.Msc. in 1968 after completing a one-year laboratory project and passing an exam.[2] Burzynski did no independent research while in medical school. [3]

Analysis of Antineoplaston Biochemistry

Tracing the biochemistry involved in Burzynski's synthesis of antineoplastons shows that the substances are without value for cancer treatment.

By 1985, Burzynski had eight antineoplastons with which he was treating cancer patients. The first five were fractions from human urine. These he called A-1 through A-5. From A-2 he made A-10, which was *insoluble* 3-N-phenylacetylamino piperidine 2,6-dione.

Burzynski said A-10 was the anticancer peptide common to all his urine fractions. He then treated the insoluble A-10 with alkali, which yielded a soluble product he named AS-2.5. Further treatment of AS-2.5 with alkali yielded a product he called AS-2.1.

Burzynski is currently treating patients with AS-2.1 and what he *calls* A-10.

In reality, AS-2.1 and A-10 are nothing more than the substances phenylacetic acid (PA) and phenylacetyl glutamine (PAG). PA is produced during normal metabolism. In humans, it is detoxified in the liver to phenylacetyl glutamine (PAG) and is excreted as such in the urine.

When urine is heated with acid, the PAG loses water and becomes the insoluble 3-N-phenylacetylamino piperidine 2,6-dione (PAPD). This is Burzynski's original A-10, the supposed anti-cancer peptide. Normally there is no PAPD in human urine.

Needing a way to make A-10 "soluble", Burzynski treated insoluble A-10 with alkali. But treating insoluble A-10 with alkali does *not* create a soluble form of A-10. It simply reinserts water into the molecule and regenerates the original PAG. This is Burzynski's AS-2.5.

From this, AS-2,1 is formed by the further treatment of AS-2.5 with alkali, which degrades it to a mixture of PA and PAG. Thus Burzynski's AS-2.1 is nothing but a mixture of the naturally occurring substances PA and PAG.

What Burzynski calls "A-10" is really A-10 treated with alkali to make in soluble. In other words, it is AS-2.5, or PAG. Burzyski claims that A-10 acts by intercalating DNA. This conclusion was reached in molecular modeling experiments using the piperidine. But the soluble "A-10" is not the piperidine. It is PAG, and PAG does not intercalate DNA.

The fact that Burzynski's current treatment regimen of AS-2.5 and A-10 is actually only PA and PAG is significant in view of the that that Burzynski himself has reported that PAG is inneffective as a treatment for cancer.[4,5].

In 1919, PA was shown to be toxic when ingested. PA can reach these toxic levels in patients with phenylketonuria (PKU). If the PKU patient is pregnant, the child in utero can suffer brain damage.

There is no evidence that Burzynski's A-2.1 or "soluble A-10" (PA and PAG) are effective against cancer. Burzynski has never demonstrated that the substances have anticancer activity. To the contrary, tumor cells from patients treated with these antineoplastons have not been "normalized." Tests of antineoplastons at NCI have never been positive. Sigma Tau, Inc., could not duplicate Burzynski's claims for AS-2.1 and A-10. The Japanese NCI has reported that antineoplastons did not work in their studies. No Burzynski coauthors have endorsed his use of antineoplastons in cancer patients.

These facts force one to conclude that Burzynski's claims for an effective treatment of cancer are not believable.

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