

RIBOFLAVIN AS A MINOR ACTIVE ANTICANCER COMPONENT OF ANTINEOPLASTON A2 AND A5

LIAU M.C.,¹ ASHRAF A.,¹ LEE S.S.,¹ HENDRY L.B.,² BURZYNSKI S.R.¹

1) Burzynski Research Institute, Inc., 12707 Trinity Drive, Stafford, TX 77477, USA.
2) Medical College of Georgia, Augusta, GA, USA.

Summary: Two yellow coloured components have been purified from urine by means of reverse phase chromatography and gel filtration on Bio-Gel P-2. One of these components was identified as riboflavin (B_2). The identification of B_2 was based on melting point, mass spectra, and absorption spectra of UV/visible light and infrared in comparison to the authentic sample. The other yellow coloured component is possibly a derivative of B_2 based on similar chromatographic properties and absorption spectra. B_2 was shown to be a selective inhibitory effector of MAT^{T} . The anticancer effect of B_2 is unrelated to its major role as coenzymes, and is probably attributable to its selective inhibition of cancer methylation complex isozymes.

Introduction

During the authors' study of the active anticancer components of Antineoplaston formulations, it has been noticed that some yellow coloured components appear to possess good anticancer activity (1). This paper describes the purification and identification of such active components. The results indicate that these active components are riboflavin* and its derivative.

It is well established that B_2 is the precursor of flavin nucleotides which function as the cofactors of flavoprotein enzymes. These enzymes are essential for biological oxidation-reduction reactions. Because of such important metabolic functions, B_2 is naturally required for growth, including neoplastic growth. Thus, it is not surprising to find reports that B_2 could promote neoplastic growth in B_2 -deprived mice (2, 3). In sharp contrast, however, B_2 was found to inhibit the growth of neoplastic cells in culture (4-6). The relationship of B_2 to cancer is intriguing. On one hand, it is required for growth and, on the other hand, it is inhibitory. These seemingly conflicting observations are difficult to reconcile if interpretations of the biological effects of B_2 are confined to its role as coenzymes. The present study examines the direct effect of B_2 on the suppression of neoplastic growth, which is apparently unrelated to its major role as coenzymes.

* Abbreviations: A2, A3 and A5, Antineoplaston A2, A3 and A5, respectively.

AdoMet, S-adenosylmethionine;

B_2 , riboflavin;

C18, octadecasilysilica (Porasil C18);

FMN, flavin mononucleotide;

MAT, methionine adenosyltransferase; MAT^N , the low K_m (methionine) normal isozyme of MAT; MAT^T , the cancer isozyme of MAT;

NBT, nitroblue tetrazolium.