

DEUTERIUM VARIATION OF HUMAN BLOOD SERUM

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The deuterium content of healthy human blood plasma is about 149-150 ppm. Some variations of deuterium content with age and sex were observed in blood plasma.

We report for the first time the variation of deuterium content of blood plasma of the patients with cancer disease. The deuterium content of blood plasma of cancerous human is diminished by about 5-7 ppm compared with the healthy one. The tumors cell have a higher speed of growth than the normal cell and this results in consuming a greater quantity of deuterium. The replacement of tap water with deuterium depleted water in a drinking water for the mice diminishes the growth rate of the tumors, and the slight increase in the deuterium concentration stimulates this growth.

1. INTRODUCTION

Some studies reveal that naturally occurring deuterium is essential for maintains the normal cell growth rate of humans (1), animals (1,2) or plants (3). The course of deuteration in mice is documented (4).

Deuteration equilibrium in the body fluids is 95% attained in ten days. The incorporation of deuterium into liver, kidney and spleen reaches equilibrium by the third week.

Similarly, variations of deuterium human fluids as blood serum or urine depending on deuterium contents of drinking water and diet are also expected.

Compared with drinking water, in Central Europe, the human blood plasma is enriched by 30‰ in the deuterium content. Change of location frequently induces a change in the isotopic content of the blood (5). Some variations of deuterium content of healthy human blood with age and sex were observed (6).

We report another variation of deuterium content of blood serum for patients with different cancer diseases. The deuterium content of blood serum of cancerous human patients is depleted by about 5-7 ppm in comparison with healthy one.

2. MATERIALS AND METHODS

The results reported here are based on the analyses of the human blood serum for 9 patients with different cancer diseases.

The serum was separated by centrifugation and was distilled in vacuum.

The deuterium analyses of water are carried out on the hydrogen gas obtained by quantitative reduction of water sample. The water sample (about 1 μ l) is introduced in a heated glass reservoir and a small portion of the sample is introduced in the mass

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spectrometer at a constant rate through a glass capillary and a quartz tube containing a uranium ribbon at 650°C, connected directly to mass spectrometer ion source.

The deuterium content is expressed:

-as deuterium ratio $R=D/H$ in ppm units

where D is the number of deuterium atoms

H is the number of hydrogen atoms.

-as δ values in "part per thousand"

$$\delta = (R/R_S - 1) \cdot 1000$$

where R is the deuterium ratio of sample

R_S is the ratio of international VSMOW standard (Vienna standard Mean Ocean Water)

The precision of the determination of δD values was $\pm 2^0/00$.

3. RESULTS AND DISSCUTIONS

The Table1 presents the deuterium content of blood serum for nine patients with different cancer diseases.

Table1.

Deuterium contents of blood plasma for the patients with cancer diseases

Sample nr.	Code name	Sampling date	Neoplasm location	R (ppm)	δ (‰)
1	HOR.	23.03.2001	colon	140.3±0.14	-99.4±1.4
2	BAN.	23.03.2001	pancreas	134.4±0.15	-137.1±1.5
3	HOI.	23.03.2001	pancreas	143.3±0.17	-80.0±1.7
4	RAD.	23.03.2001	stomach	142.2±0.14	-87.1±1.4
5	BAT.	23.03.2001	stomach	145.6±0.2	-65.2±2.0
6	COL.	23.03.2001	colon	144.6±0.16	-72.0±1.6
7	FIL.	23.03.2001	rectal	143.0±0.1	-82.0±1.0
8	PET.	23.03.2001	pancreas	144.9±0.12	-69.7±1.2
9	MIS.	23.03.2001	colon	143.6±0.15	-78.1±1.5
Mean value				142.4±3.4	-85.6±3.4

The human serum in Central Europe is enriched with 30 ‰ compared with drinking water mean deuterium content. The deuterium contents of the blood serum of healthy humans (about -37 ‰) was higher compared with mean deuterium content of the mean drinking water deuterium content (about -69 ‰) by about 32 ‰ (5,6).

On the contrary, the deuterium content of blood serum for patients with cancer disease is lower or very close to the mean deuterium content of the drinking water. Our result is in concordance with some studies (1,2,3,4). Such a study, using deuterium depleted water, shows that naturally occurring deuterium is essential for maintaining the normal cell growth rate in animals, humans or plants. Deuterium depleted water proved an inhibitory effect in plant growth or in proliferation of tumors cells bath for animal and human.

The tumor cells are deuterium consuming. As a consequence the deuterium content of blood serum of tumors patients is depleted in deuterium compared with healthy one.

4. CONCLUSIONS

The blood plasma for healthy human is enriched in deuterium compared with mean local deuterium content of the drinking water. For the human patients heaving different cancer diseases the deuterium content of blood plasma is diminished or close to mean deuterium content of drinking water and more depleted compared with healthy humans. Such a variation of deuterium content of human blood serum is correlated with the cancer disease .

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