Letter to the Editor

The Pattern of Lactate Dehydrogenase Isoenzymes in Testicular Germ Cell Tumors Differs from That of the Liver

FINN E. VON EYBEN* and GUNNAR SKUDE†

*Department of Oncology and Radiotherapy, Odense Hospital, DK-5000 Odense, Denmark and †Department of Clinical Chemistry, Kalmar County Hospital, S-381 85 Kalmar, Sweden

CONSISTENT with the study of van T Sant et al. [1], our investigations [2-5] indicate that serum lactate dehydrogenase (S-LDH) may be used as a tumor marker of testicular germ cell tumors. However, the LDH isoenzyme pattern of testicular germ cell tumors diverges maximally from that of the liver. The increased activity of LDH in testicular germ cell tumors is mainly due to anodal LDH isoenzymes, especially LDH-1 [3, 5-8], whereas LDH-5 dominates in the liver [5].

The LDH isoenzyme pattern in testicular germ cell tumors also diverges from that of mature germ cells of the testis due to an increased production of the B subunit of the anodal LDH isoenzymes and a suppression of the C subunit of LDH-X and other additional LDH isoenzymes [9]. These changes do not contradict the concept that the tumors develop from the germ cells as they may reflect biochemical alterations in the malignant transformation [10].

REFERENCES

- 1. van'T Sant P, Sleijfer DT, Schraffordt Koops H et al. The pattern of gamma-glutamyl transpeptidase, alkaline phosphatase, serum glutamyl oxalate transaminase and serum pyruvate transaminase in patients with disseminated non-seminomatous testicular tumors. Eur J Cancer Clin Oncol 1984, 20, 209-215.
- 2. von Eyben FE. Biochemical markers in advanced testicular tumors. Serum lactate dehydrogenase, urinary chorionic gonadotropin and total urinary estrogens. *Cancer* 1978, 41, 648-652.
- 3. von Eyben FE, Skude G, Fosså SD, Klepp O, Børmer O. Serum lactate dehydrogenase (S-LDH) and S-LDH isoenzymes in patients with testicular germ cell tumors. *Mol Gen Genet* 1983, 189, 326-333.
- 4. von Eyben FE, Jacobsen GK, Pedersen H et al. Multivariate analysis of risk factors in patients with metastatic testicular germ cell tumors treated with vinblastine and bleomycin. *Invasion Metastasis* 1982, 2, 125-135.
- 5. von Eyben FE. Lactate dehydrogenase and its isoenzymes in testicular germ cell tumors: an overview. *Oncodevelopm Biol Med* 1983, 4, 395-414.
- 6. von Eyben FE, Skude G, Tropé C, Wennerberg J, Mikulowski P. Lactate dehydrogenase isoenzyme 1 (LDH-1) in athymic mice with xenografts of a human testicular germ cell tumor. *Mol Gen Genet* 1982, 186, 427-431.
- 7. von Eyben FE, Skude G. Lactate dehydrogenase (S-LDH) and its isoenzyme, S-LDH-1, in serum are markers of testicular germ cell tumors. *Clin Chem* 1984, **30**, 340-341.

- 8. Liu F, Fritsche HA, Trujillo JM, Samuels ML. Serum lactate dehydrogenase isoenzyme 1 in patients with advanced testicular cancer. Am J Clin Pathol 1982, 78, 178-183.
- 9. Skude G, von Eyben FE, Kristiansen P. Additional lactate dehydrogenase (LDH) isoenzymes in normal testis and spermatozoa of adult man. *Mol Gen Genet* 1984, 198, 172-174.
- 10. von Eyben FE, Mikulowski P, Busch C. Microinvasive germ cell tumor of the testis. *J Urol* 1981, 126, 842-844.