Eur J Cancer Clin Oncol, Vol. 22, No. 4, pp. 535–536, 1986.
Printed in Great Britain.

0277-5379/86$3.00+0.00

Letter to the Editor

Increased Serum Alpha-Melanocyte Stimulating Hormone (Alpha-MSH) in Human Malignant Melanoma

G. GHANEM,*† D. LIÉNARD,* P. HANSON,* F. LEJEUNE* and J. FRÜHLING†
**Laboratory of Oncology and Experimental Surgery and †Laboratory of Radioisotopes, Department of Radiotherapy, Jules Bordet Institute, Université Libre de Bruxelles, Brussels, Belgium*

ALPHA-MELANOCYTE stimulating hormone (alpha-MSH) is a pituitary peptide responsible for increasing melanin synthesis by melanocytes in vertebrates. Despite the important physiological role of this hormone, alpha-MSH determination in normal human plasma has only been reported by a few investigators. High alpha-MSH levels (> 80 pg/ml) have been described in 50% of pregnant women plasma at the term of the gestation [1]. Similar levels (> 60 pg/ml) have been found in healthy adults, while variations of these levels have been described according to psoralen and UVA exposure, depending on the skin phototype [2, 3]. Other researchers could not detect alpha-MSH in human plasma [4].

Since human malignant melanoma cells can express alpha-MSH receptors [5], alpha-MSH determination in patients suffering from this disease became of interest. We have developed a sensitive and specific radioimmunoassay to study alpha-MSH concentration profiles in melanoma patients' and healthy persons' sera. Technically, a modification of the Chloramine-T2 iodination (^{125}I) method, which we have already described [6], was used together with an antiserum that gave cross-reactions of less than 0.001% with peptides closely related to alpha-MSH [7].

Our updated results show 3 times more detectable serum alpha-MSH levels in 64 (34.4%) out of 186 melanoma patients (regardless of the clinical evolution) as compared to 11.2% in 71 control patients. In the cord blood of 280 new-born children, 39.3% showed detectable quantities of the hormone.

Furthermore, in melanoma patients, we could see alpha-MSH concentrations increasing in 17 out of 27 progressing to stage III (disseminated) melanoma cases before chemotherapy — 15 out of 25 at stage III and two out of two at stage II. In contrast, we have found a significant decrease of alpha-MSH in nine out of 11 advanced melanoma patients (stage III) who responded to chemotherapy (eight partial remissions and one complete remission). The remaining patients with high alpha-MSH levels but no sign of dissemination, were found in 17 out of 18 cases to belong to the group of skin phototype I and II — i.e. burning after exposure to u.v. light.

Since alpha-MSH pituitary release has been demonstrated to be controlled by a mass action-type feed back [8] and to depend on skin irradiation as a peripheral sensor to u.v. [2, 3], we may tentatively conclude that increased alpha-MSH in melanoma is not due to paraneoplasic tumour secretion but rather to an increased central release. Malignant melanoma progression and skin u.v. irradiation might serve as a positive feed back mechanism. Although we cannot yet explain the pathological mechanism(s) whereby plasma alpha-MSH levels can increase in melanoma, our results amply justify further studies of alpha-MSH as a potential tumour marker in melanoma.

Accepted 24 October 1985.
Correspondence should be sent to: G. Ghanem, Laboratory of Oncology and Experimental Surgery, Jules Bordet Institute, Rue Héger-Bordet 1, 1000 Brussels, Belgium.

EJC 22/4-K

REFERENCES

1. Clarck D, Thody AJ, Shuster S, Bowers H. Immunoreactive alpha-MSH in human plasma in pregnancy. *Nature* 1978, **273** (5658), 163–164.
2. Holzmann H, Altmeyer P, Bartelt R. The influence of U.V.A rays on alpha-MSH plasma concentrations. In: *Proceedings of the XIIth International Pigment Cell Conference — Giessen*, September 18–23, 1983. Tokyo, Tokyo University Press, 1983, 11.
3. Holzmann H, Altmeyer P, Stohr L, Chilf GN. Die Beeinflussung des alpha-MSH durch UVA-Bestrahlungen der Haut. Vorläufige Kurzmitteilung. *Der Hautarzt*, 1983, **34**, 294–297.
4. Orth D, Tanaka K, Nicholson W. Melanocyte-stimulating hormones (MSH's) and lipotropic hormones (LPH's). In: Jaffe BN, Behrman HR, eds. *Methods of Hormone Radioimmunoassay*. New York, Academic Press, 1979, 285–313.
5. Legros F, Coel J, Doyen A, Hanson P, Van Tieghem N, Vercammen-Grandjean A, Frühling J, Lejeune F. Alpha-melanocyte stimulating hormone binding and biological activity in a human melanoma cell line. *Cancer Res* 1981, **41**, 1539–1544.
6. Ghanem G, Legros F, Lejeune F, Frühling J. Comparison and evaluation of different methods for alpha-MSH labelling. *J Immunol Meth* 1982, **54**, 223–232.
7. Ghanem G. Dosage radioimmunologique de l'hormone mélanotrope (alpha-MSH). Son usage comme traceur radiopharmaceutique et comme vecteur de médicaments dans le mélanome malin. Thèse de Doctorat en Sciences Pharmaceutiques, Université Libre de Bruxelles, Belgium, 1985.
8. Kastin A, Arimura A, Schally A. Mass action-type direct feedback control of pituitary release. *Nature New Biology* 1971a, **231**, 29–30.