

Melanoma in a *Carassius auratus* (L.): study with optical microscopy, electron microscopy and immunohistochemistry

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Abstract

In this study, a cephalic region melanoma was described in a *Carassius auratus* (L.). The neoplasm was composed of two different patterns, one in the macroscopically pigmented zone where round and oval cells with irregular nuclei with few anaplastic cellular elements and with abundant intracytoplasmic black pigment proliferated. Another sector, amelanotic (these cells do not contain black pigment), were the most important, where irregular cells were observed with anisocytosis, anisokaryosis and hyperchromatic nuclei. The immunohistochemical positive pattern for Melan-A and HBM-45, along with the electronmicroscopic results, where melanosomes were found, confirm the melanoma diagnosis.

Introduction

Melanoma is a malignant tumour originated in the melanocytes of the skin, mucosa, eyeball, central nervous system, mesentery and inner ear. Melanocytic neoplasms that can occur in both animals and humans generally present themselves as cutaneous, oral and ocular neoplasms (Ramos-Vara et al., 2002).

In humans, the epidemiological data concerning this tumour are alarming, since its incidence has been increasing in a large number of countries, at a rate of approximately 5% a year. Currently, melanoma is the leading cause of skin cancer death, responsible for 65 to 75% of them, as well as 1 to 2% of all cancer deaths (Marks, 2000).

There are almost no differences in the histopathological analysis of melanomas of fish and other animals, including humans. Neoplasms originating from pigmented cells are more common in fish than in other animals, including humans. In humans only melanomas originating from melanocytes (cells derived from the neural crest) are observed and there are no other pigmented cells (Masahito et al., 1989).

The cause of melanoma in fish is unknown, in some cases, such as melanomas in *Xiphophorus*, they have a genetic component (Lu et al., 2017a, 2017b). In some cases it is related to oncogen *ras* expression and neoplasias in goldfish (Nemoto et al., 1987).

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