

NEWS FROM THE WORLD OF ONCOLOGY

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Molecular Markers

The field of veterinary oncology is changing and growing all the time. No longer do oncologists only worry about tumour type and how to treat it. We know that this is a simplistic way of approaching cancer. As oncology has evolved we have become able to identify tumour characteristics that go well beyond basic histological evaluation. The evolution of advanced molecular techniques such as immunohistochemistry and immunocytochemistry has allowed additional tumour characteristics to be brought to light.

Briefly, these advanced molecular techniques identify "antigens" such as clusters of differentiation, proliferative molecules, growth receptors, DNA regions or immune system components. These factors are sub-microscopic and cannot be detected with light microscopy alone.



What is the clinical application? Basically as it stands now assessment of molecular markers play three major roles, each one significantly changing how cases are diagnosed and treated and managed.

Tumour identification: It is not uncommon for a tumour to present the pathologist with a dilemma as to what the exact cell type is. An example would be an oral tumour having characteristics of both poorly differentiated melanomas and sarcomas. Often these tumours are indistinguishable by light microscopy. However with the application of markers specific to melanoma and sarcoma, the pathologist is often able to make the diagnosis as the tumour will only express markers for its true tissue type. Another example would be poorly differentiated round cell tumours. There are 7 types of round cell tumours and with poorly differentiated tumours it can be nearly impossible to determine which cancer is present. Within this tumour class the treatments are drastically different. Lymphoma, mast cell tumours (MCT), plasma cells tumours and melanoma, all round cell tumours, have completely different treatment protocols and prognoses. Use of a round cell molecular panel will allow for tumour identification, and the appropriate therapy can be applied.

Tumour proliferation: A great deal of work has recently demonstrated the value of understanding the proliferative potential of tumours when making treatment recommendations. The tumours to which an understanding of proliferation potential has played the largest role are MCT and soft tissue sarcomas (STS). We know that Grade I MCT and STS do not usually require adjunctive therapy. We also know that Grade III MCT and STS do require adjunctive therapy. The question is what to do with Grade II tumours. We are now able to investigate the proliferative potential of these tumour types. This is done by application of molecular techniques to quantify cellular, membrane and nuclear markers of proliferation. I routinely order proliferation panels on all of my Grade II MCT and Grade II STS. If the panel indicates low proliferation then I will not recommend chemotherapy. However, if the panel indicates high proliferative potential then I will always recommend follow-up chemotherapy.

Tumour sub-type identification: Molecular techniques allow us to determine the sub-type of certain cancers. Lymphoma is the best-known example. Immunophenotyping allows for the classification of the lymphoma as B-cell or T-cell, a very important prognostic indicator.

Molecular marking has dramatically changed the way oncology is practiced and now plays a very prominent role in my daily practice. In the future drugs will likely be developed that will target some of the tumour specific antigens and will allow for specific and targeted drug delivery that should help to improve survival times and cure rates.

Dr. Kevin Finora is a board certified Oncologist and Small Animal Internist. He sees patients Wednesday (including evenings) to Saturday at VEC/RC South. Please do not hesitate to contact Dr. Finora if you have any cancer related questions.

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