Intratumoral Neostim Therapy

What is immunotherapy?

The immune system constantly protects the body against infections and abnormal cells. Cancer, however, can hide from or suppress these natural defenses.

Immunotherapy is designed to “wake up” the immune system, helping it recognise cancer cells as threats and mount a stronger, targeted attack.

Rationale

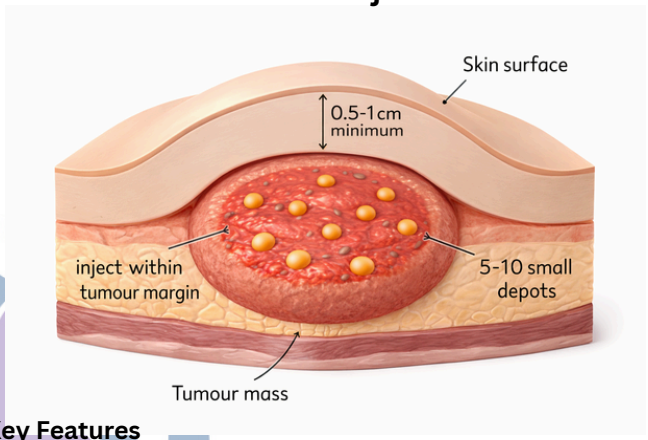
Our intratumoural adjuvant therapy is a locally delivered immunotherapy designed to stimulate a powerful anti-cancer immune response from within the tumour itself.

Neostim turns the tumour into an *in situ* vaccine.

By injecting a small volume of immune-activating formulation directly into the tumour, this therapy aims to convert the tumour from an immune-silent site into an immune target.

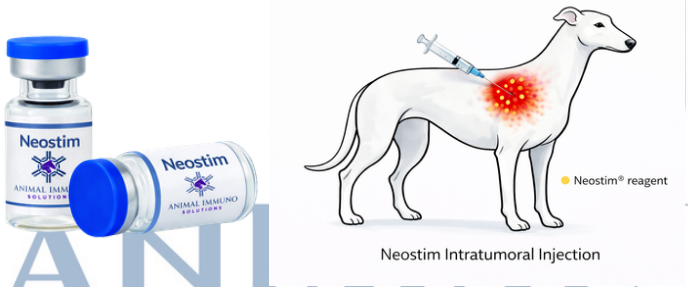
The tumour tissue serves as a source of cancer antigens specific to the individual patient, while the Neostim or Neostim Plus serves as a danger signal to boost immune response.

Neostim injection



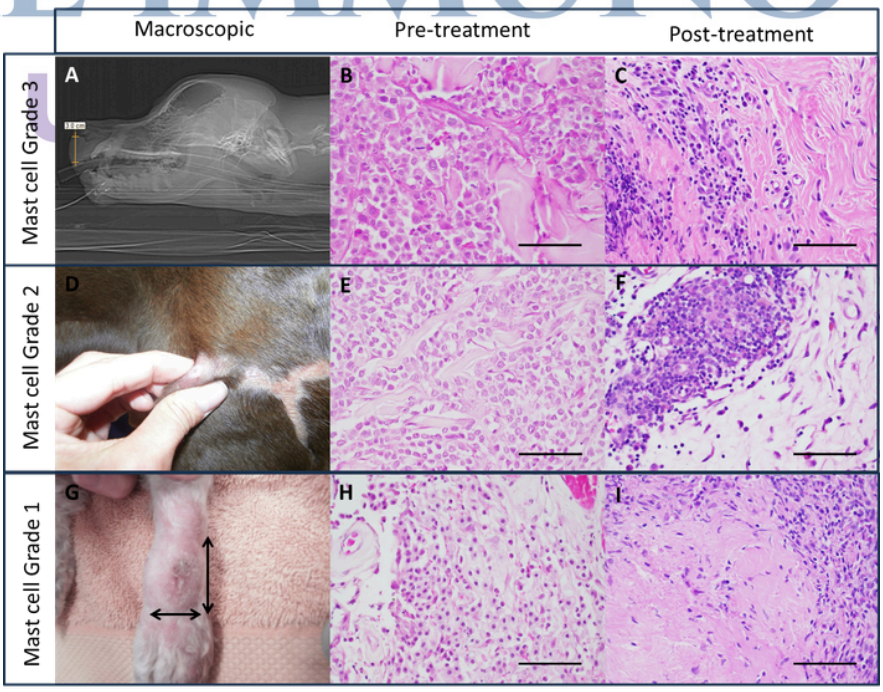
Key Features

- Direct tumour targeting: immune activation begins exactly where it is needed
- Non-systemic delivery: avoids many of the side effects associated with traditional chemotherapy
- Rapid immune engagement: immune responses may be seen within weeks
- Cost-effective and practical: designed for use in real-world general veterinary practice
- Combinable: can be used alone or alongside surgery, radiation, or other immunotherapy
- Safe for the patient’s family and veterinary care team: being immune based the vaccine does not produce any toxic residues or metabolites
- Suitable for use in primary care practice and specialist settings

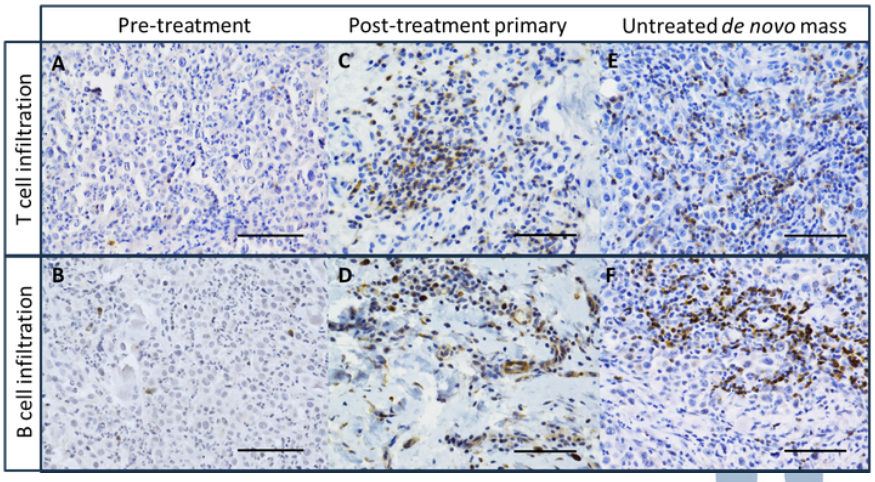


3 dogs with Mast cell tumour treated with Neostim.
Panel A shows the pre-treatment clinical findings.
Panel B shows the pre-treatment histology.
Panel C shows the post-treatment histology after tumour remission.

Dog 1 was treated after the mass became refractory to Palladia. The treated mass went into remission at 3 weeks and didn’t reoccur. Disease free interval 4 months, with *de novo* mast cell tumours able to be surgically resected and containing high immune cell infiltrates. Dog 2 had a reoccurrence after radical surgery. The treated mass and a secondary uninjected mast cell tumour went into remission. Total survival 18 months. Dog 3 had a durable remission of a non-resectable mass on the paw.



Source Carroll CSE etal Allavena R Fahrer AM Simple and effective bacterial based intratumoral cancer immunotherapy J Immunother Cancer 2021 Sep99e002688 doi 101136jitc 2021 002688text



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Neostim can generate systemic immune responses in non-injected and de novo tumours.

Immunohistochemistry for T cells (CD3) and B lymphocytes (CD79a) in a pretreatment nasal high grade Mast Cell Tumour. Post treatment biopsy after the injected nasal mass went into total remission shows T and B lymphocytes recruited to the tissue, and an absence of cancerous cells. A *de novo* Mast cell tumour arising in the neck skin four months later from the same dog showing abundant intratumoral lymphocytes despite only a single injection of Neostim being delivered into the nasal tumour. The neck mass did not recur despite incomplete surgical resection.

Considerations for administration

Neostim and Neostim Plus are suitable for patients with superficial tumours that are directly injectable:

·can't be removed surgically,
·where there is residual disease after attempted excision,
·or where the owner has declined surgery.

For example, recurrent or multicentric mast cell tumours, and tumours on limbs where amputation is declined. It is well suited to dermal and oral cancers such as mast cell tumour or melanoma, with both cancers showing complete remission with intratumoral adjuvant therapy as a sole treatment in a subset of patients.

Clinical benefits

In clinical trials beneficial clinical responses include tumour remissions, tumour shrinkage, tumour growth stasis, reduction in metastatic or multicentric cancer burden, extensions in survival times.

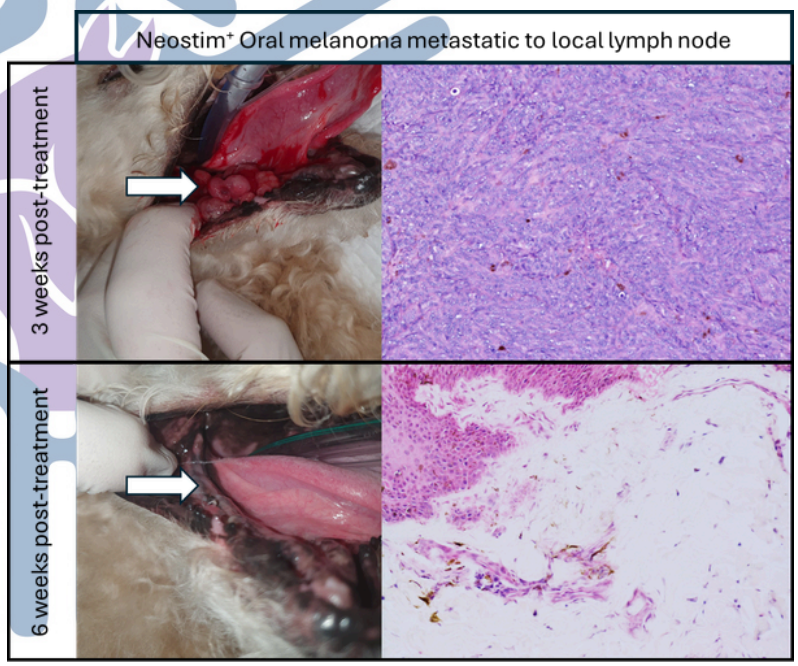
In clinical trials positive clinical benefits are seen on average in 30% of patients.

Safety and tolerability

Clinical experience has shown this therapy to be well tolerated, with side effects typically limited to transient local inflammation consistent with immune activation.

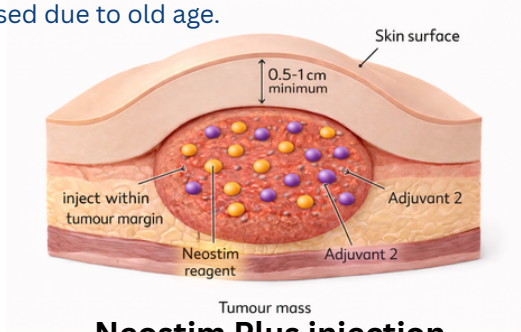
Dogs may get increased swelling in the injected tumour. Local ulceration may occur if the treatment is injected superficially. The risk of ulceration is higher in dogs with mast cell tumour, as these tumours are inherently prone to ulceration.

Because the treatment is delivered directly into the tumour, systemic toxicity is minimal, making it suitable for patients who may not tolerate aggressive systemic therapies.



Images courtesy of Dr Matthew Weston and Dr Rachel Allavena.

Neostim Plus therapy. Dog with an oral melanoma which was metastatic to the draining lymph node staged on cytology. The dog received Neostim Plus 3 weeks prior to panel A . By 6 weeks post treatment the mass has gone into complete remission shown in panel B. Total post treatment survival 14 months. Dog euthanased due to old age.



Neostim Plus injection

Neostim and Neostim Plus are not registered veterinary products and must therefore be used off label. Administration is restricted to registered veterinarians, who must exercise independent clinical judgment, ensure appropriate case selection, and obtain informed owner consent in accordance with relevant state and territory veterinary legislation and professional standards. As with all off-label therapies, responsibility for safe use, monitoring, and adverse event management rests with the treating veterinarian.