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CaniVax
Canine Cancer Vaccines
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Can AI Cure Cancer in Dogs? A Closer Look at Personalised Vaccines

Personalised cancer vaccines are gaining attention, particularly with recent AI-driven examples. This article explains what is actually happening, and why a structured approach matters.

In brief

- Personalised cancer vaccines use tumour data to guide immune targeting.
- AI can assist in identifying candidate antigens.
- The main challenge is selecting biologically meaningful antigens.
- Structured clinical workflows are required for responsible delivery.

What people have seen

Recent stories have highlighted cases where personalised cancer vaccines were created using artificial intelligence. In these examples, tumour data is analysed, antigens are identified, and a vaccine is designed within a relatively short timeframe.

These accounts are compelling. They suggest that complex treatments may be developed more quickly and more accessibly than before. At the same time, they raise an important question. How does this approach translate into a reliable and medically responsible treatment pathway?

What actually happens in these approaches?

At a high level, the process is conceptually straightforward.

A tumour sample is sequenced to identify genetic changes. These changes are analysed to find features that distinguish the tumour from normal tissue. From this, a shortlist of potential antigens is generated. A vaccine is then designed to educate the immune system recognise these antigens on tumours.

This represents a meaningful advance. It shows that personalised cancer vaccines for dogs, and in human medicine, are technically feasible.

However, it is best understood as a proof of concept. It demonstrates what can be done in principle, rather than establishing a standardised clinical pathway.

Where does the real challenge lie?

The central challenge is not the generation of candidate antigens. It is the selection of antigens that are biologically meaningful.

Not all tumour-specific changes will be recognised by the immune system. Some may be irrelevant. Others may not be presented effectively to immune cells. A small subset may have the potential to drive a meaningful immune response.

This introduces several layers of complexity:

- Distinguishing signal from noise in tumour data.
- Identifying tumour-specific antigens that can be recognised by T cells.
- Ensuring that selected antigens are relevant in the context of the individual dog.
- Delivering this in a way that is consistent and controlled.

These steps determine whether a vaccine is plausible, not just possible.

Why this matters?

Designing a personalised cancer vaccine is not only about identifying antigens. It is about selecting antigens that the immune system can recognise and respond to in a meaningful way.

From concept to process

A professional approach translates this concept into a defined workflow.

The process typically begins with sample collection. Tumour tissue and a blood sample are obtained by a veterinarian.

These samples form the basis of further analysis.

Genomic and molecular analysis is then performed to identify features that distinguish the tumour from normal tissue.

This is followed by immunological screening, where tumour-specific antigen signatures are evaluated to determine which are most likely to be recognised by the immune system.

Selected antigens are incorporated into a personalised vaccine design. This design is then manufactured in a specialist facility operating under established quality systems and controls. The vaccine is administered under veterinary supervision, with follow-up and monitoring over time.

Each step has a defined role. Together, they form a system rather than a sequence of independent actions.

Why does a well-defined process matter?

An exploratory approach can demonstrate what is achievable in a single case. A systematically reproducible approach is required to deliver this consistently and of wider benefit for ill dogs.

The distinction is not about capability. It is about reliability.

A defined workflow introduces:

- Consistent criteria for target selection.
- Controlled methods for analysis and interpretation.
- Standardised manufacturing conditions.
- Clear points of clinical oversight.

This reduces variability and supports responsible delivery. It also allows each case to be assessed within a framework, rather than being treated as a one-off exercise.

For dog cancer immunotherapy to progress, this transition from ad hoc design to structured process is necessary.

What role does AI play?

Artificial intelligence is a valuable tool within this workflow.

It can assist with:

- Analysing complex tumour data.
- Identifying patterns that distinguish tumour from normal tissue.
- Prioritising candidate tumour-specific antigens.

This can improve efficiency and help focus attention on the most relevant signals.

However, AI does not replace biological understanding. It does not determine whether a target will produce a meaningful immune response in a living system. These decisions remain grounded in immunology, clinical context, and expert judgement.

AI supports the process. It does not define it.

You can also read more on our science page.

Professional delivery and oversight

Personalised cancer vaccines for dogs require more than design. They require controlled execution.

This includes:

- Manufacturing in facilities operating under established quality systems.
- Defined processes for handling and preparing materials.
- Veterinary supervision during administration.
- Case-by-case assessment to determine suitability.

Each stage is conducted with oversight and defined standards. This is particularly important in an emerging field, where consistency and safety are central considerations.

The objective is to treat each case as a medical intervention, not an isolated experiment.

What should be expected?

It is important to set realistic expectations.

Personalised cancer vaccines represent an emerging area of veterinary medicine. While the underlying science is advancing, outcomes may vary between individual dogs.

This approach is not intended as a guaranteed cure. Its purpose is to support a targeted immune response against cancer, based on the specific characteristics of each case.

Suitability is determined individually, and decisions are made in consultation with a veterinarian. As with any medical intervention, careful assessment and monitoring are required.

Looking ahead

The development of personalised cancer vaccines reflects a broader shift in oncology. Treatment is moving towards approaches that are more targeted, more data-informed, and more closely aligned with the biology of each case.

Artificial intelligence will continue to play a role in analysing data and guiding early-stage decisions. At the same time, progress will depend on integrating this capability with immunology, clinical expertise, and controlled execution.

The goal is not only to design personalised treatments. It is to deliver them in a way that is reliable, responsible, and grounded in medical practice.

If you would like to explore whether a personalised approach may be suitable for your dog, you can learn more about our process or contact us to discuss next steps with your veterinarian.