

**T**hey can be unsightly and potentially disfiguring — but equine sarcoids hold a special attraction for Dr. Bruce Wobeser of WCVM's Department of Veterinary Pathology. As the PhD student explains, the potential for finding a more effective way to treat equine sarcoids prompted his double-take of this ugly problem.

"In most cases, they're slow-growing tumours: some resolve spontaneously while some get worse. And then there's a proportion of equine sarcoids that just go wild and become huge. If they develop in a bad place, that can be very bad news. For example, a horse can go blind if a sarcoid grows around the eye area, and in some cases, you might even lose the horse," says Wobeser.

Getting rid of sarcoids is challenging since tumours often come back after treatment. Even worse, conducting biopsies or surgically removing some types of tumours can trigger more rapid growth. "If nothing else, it would be good to be able to make a prognosis so you can decide which ones to leave alone and which ones to treat," explains Wobeser. "If we could come up with other treatment options, it would be even better."

But before better therapies can be developed, scientists need to do more homework: equine sarcoids are the most-commonly diagnosed skin tumours in horses around the world, but veterinary researchers know very little about them.

Answering some of equine sarcoids' "unknowns" is the goal for two new research studies that are supported by WCVM's Equine Health Research Fund. Dr. Andy Allen, a veterinary pathologist and Wobeser's graduate supervisor, is leading the investigations in collaboration with Wobeser and Dr. Beverly Kidney, a veterinary pathologist who has specialized expertise in investigating viral oncogenesis — particularly papillomaviruses.

### Do sarcoids vary by region?

Although equine sarcoids are diagnosed in all parts of the world, Wobeser says there seems to be regional variations in the types of sarcoids diagnosed and in the types of horses most commonly affected by the skin tumours.

"When you look through the literature, you might find one study that says mostly young horses up to seven years of age are affected, while another will suggest the average age is nine, and yet another report says that horses of any age are susceptible," explains Wobeser.

"Until now, no one has examined what's going on around here and that's what we want to do in our first study: we want to develop a 'profile' of the tumours in Western Canada."

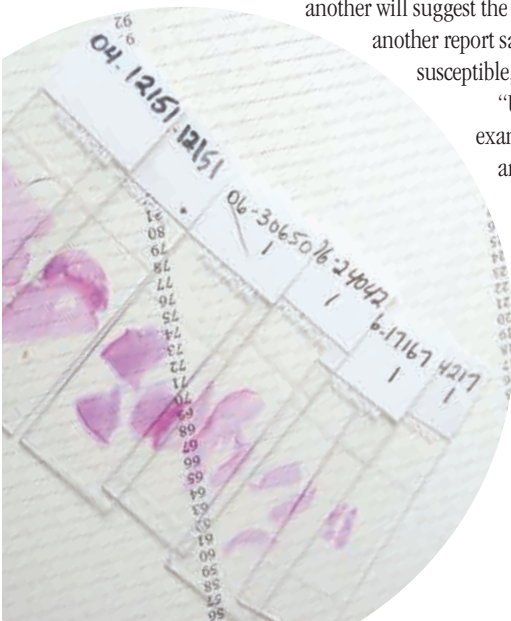
As a first step, WCVM researchers will go through 10 years' worth of records from western Canadian veterinary diagnostic laboratories and



# Sarcoid Sleuths

By Roberta Pattison

An unattractive equine skin tumour is getting a lot of **second looks** from a team of WCVM veterinary pathologists.



collect information on equine sarcoid cases. Besides collecting statistics on the age, breed and sex of affected horses, the team will gather details about the tumours including the number, location and type of lesions for each case.

Another important piece of the epidemiological puzzle is whether affected horses live alongside cattle as well as other horses. “Previous research has shown a link between equine sarcoids and two different types of bovine papillomavirus (BPV), and the disease is presumed to be infectious. Initial evidence suggests that horses living alongside cattle are at greater risk, but so far, it’s not conclusive,” says Wobeser.

To explore that potential link even further, the research team will test for the presence of BPV and the disease type in archived tumour samples from the diagnostic laboratories. These findings may help researchers determine whether equine sarcoids in Western Canada have similarities to the disease identified in other parts of the world.

“In the western United States, it’s almost always Type 2 BPV that’s involved in equine sarcoid cases. But Type 2 BPV isn’t found in European sarcoid cases: only the Type 1 BPV virus. Are these equine sarcoids the same disease? We’d like to find out.”

While the disease’s epidemiological profile will address some immediate questions, the study’s key value is to establish a knowledge base for future sarcoid research — especially in Western Canada. Eventually, more specific studies will result in better modes of prevention and treatment for veterinarians in the field.

### What makes sarcoids tick?

While sarcoids are a common problem in horses, little is known about what makes normal *fibroblasts* (the cells from which normal connective tissue derives) turn into sarcoid tumour cells.

A horse’s body creates cells that live, die and are eventually replaced: a normal process that’s essential for good health. *Apoptosis*, or programmed cell death, eliminates old and unhealthy cells. But when this process is absent or not working properly, problems arise. Some tumours result from the rapid division of cells, while others appear when cells just live longer than expected.

Since earlier studies have shown that sarcoids don’t appear to be associated with excessive cell proliferation, the WCVM researchers will try to discover if sarcoid cells somehow escape apoptosis — or if apoptotic cells are absent in the tumours. In this second sarcoid study, the team will examine up to 90 archived tumour tissue samples that represent all six types of sarcoids seen in horses. The researchers will then use immunohistological markers to evaluate apoptosis in the tumour cells.

When veterinarians are dealing with sarcoids, one difficulty is differentiating the rapid-growing, problematic tumours from the slow-growing, innocuous type. “We want to find a marker that you can stain on a slide,” explains Wobeser. “Are the bad tumours expressing different markers — or do they express the same markers differently?”

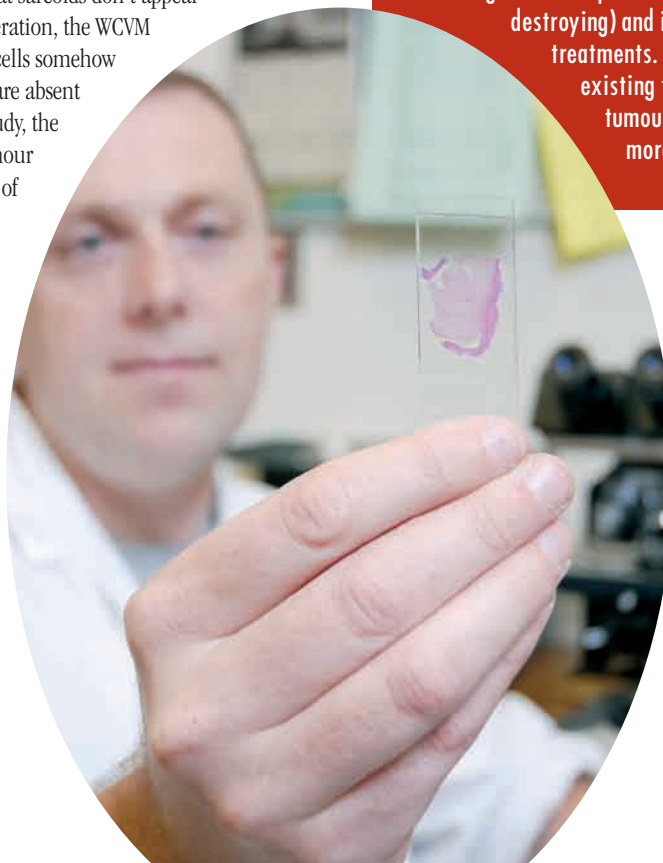
If this study’s findings show that the transformed cells express these markers, they may become potential

targets for novel therapies or markers that veterinarians could use to predict the prognosis for treated sarcoids. That’s a crucial part of dealing with sarcoids since these skin tumours often recur after treatment — or therapies can even trigger more rapid growth.

“It’s sequential: first, we need to know what are sarcoids? Second, how are they growing? Third, are there tumour markers? And after that, can we use these markers for treatment?” explains Wobeser, adding that tumour markers are regularly used in human and pet cancer cases. “If something unexpected happens along the way — as it so often does — then one possibility might lead to another.” **H**

## An Equine Enigma: QUICK FACTS ON SARCOIDS

- Equine sarcoids are the most common tumour diagnosed in horses. About 90 per cent of skin neoplasms and a reported 20 per cent of all tumours in horses are sarcoids.
- Sarcoids are categorized as occult, verrucous, nodular, fibroblastic, mixed and malignant.
- The lesions produced by sarcoids range in appearance from small, relatively insignificant areas of skin roughness and hair loss to large, unsightly masses.
- Depending on their location, these skin tumours can seriously impair a horse’s comfort and performance. Sarcoids commonly occur near horses’ eyes or on their eyelids — leading to impaired vision or even blindness. Sarcoids can also limit a horse’s use if the tumours develop in the girth or bridle area.
- Veterinarians can try to remove sarcoids using a variety of surgical techniques. Other options include cytotoxic (cell-destroying) and immune therapies as well as radiation treatments. But one of the main difficulties with existing treatment options is that the skin tumours often recur or therapies can trigger more rapid growth.



*Roberta Pattison is a freelance writer who is a regular contributor to the national publication, Dogs in Canada. Recently retired from grain farming, she still lives on her farm near Delisle, Saskatchewan.*

**PRECEDING PAGE** (above): PhD student Dr. Bruce Wobeser’s long-term goal is to investigate novel treatments for equine sarcoids. Below: Histologic slides of equine sarcoid samples. **THIS PAGE:** Histologic slides from western Canadian equine sarcoid cases will supply scientists with novel information about the common skin tumours.