

Who do (g) you think you are?



If you own a crossbreed or a mixed breed, do you know what kind of dogs are in his ancestry? Really? Sure about that? BEATRICE SAYERS orders a DNA test for her beloved Tonto, and awaits the results...

“Allsorts”, “Heaven knows”, “Some sort of terrier, I think”, or just “A dog” – I’ve developed a range of responses to other owners in my park asking, “What is he?”

Tonto was a stray before he came to live with us last year. The documents I received with him from Battersea Dogs and Cats Home’s Old Windsor branch said he was a Yorkshire Terrier cross,

so that was his breed when, aged 18 months, I registered him with my vet practice. It was no more than Battersea’s guess – they thought he might also have some Lakeland Terrier in his ancestry – albeit as good a guess as any.

When he joined the daily dog gatherings near me, Tonto was a real hit. Super-cute and with a planet-sized personality, he made friends with every human and (almost) every dog. He particularly

enjoyed playing with a Miniature Schnauzer, and I noticed Tonto’s ears – and tail – looked exactly like the Schnauzer’s. Now, Tonto is my first dog, and I knew next to nothing about breeds, but I wondered if he might have Schnauzer in him. Then again, two owners of West Highland White Terrier crosses have come up to me on separate occasions in the street to tell me Tonto looks exactly like their pets.

Over the months, Tonto and I have bonded beautifully, and he’s learnt a good repertoire of tricks. I’m so happy to have him in my life. But I began to wish I knew what breeds were in him, and to be able to answer those “What is he?” questions. I didn’t need to know, but the fact that it was possible to test created an urge, which gradually became so strong that, as a gift to both of us to celebrate his rescue anniversary, I decided to satisfy my curiosity with a DNA analysis.

But I had mixed emotions about unlocking his genetic secrets – would I still love him just as much as I did now?

TIME TO TEST

As a first task, I surveyed the various DNA-testing companies and asked myself what exactly it was I wanted to know. For pedigree dogs, the Kennel Club website explains parentage verification tests for owners who want to certify the breed type of a dog’s mother and father, and DNA profiling (genotyping) to secure a failproof ID for a dog in case they are lost or stolen.

All I wanted to do, though, was to identify the main breeds in Tonto’s ancestry. I thought a company with a large database of breeds would offer greater accuracy, and while most testing companies seemed to be based in the US, the tests themselves can be done by post, using cells collected on a mouth swab. After weighing them up, I plumped for Wisdom Panel (version 3, which I used, cost £75 from the manufacturer; version 2 is £48.99 on Amazon). Wisdom Panel says it has the largest database, with more than 200 breeds and 12,000 samples to check against.

After the testing kit arrived, the only difficulty was finding a time to take a swab; oral bacteria hinder accuracy, so it had to be done at least two hours after Tonto had eaten. After rubbing the inside of his cheek with a tiny brush for 15 seconds, I then had to repeat the process and leave my two sticks to dry. I activated my kit online and posted everything to a lab in Ayrshire.

Now I needed patience, but not much, as the results would be ready in two weeks. I was worried in case I was somehow disappointed with them, or that the sample would turn out to be unreadable and I’d have to take more swabs.

THE RESULTS ARE IN...

“The wait is over!” Wisdom Panel’s email announced excitedly. The message reached my phone just as I arrived at a London tube station. But at the big moment, I couldn’t reach the online link to the results because I was underground with no internet access. The suspense mounted.

When I could finally ‘click here’, I found a page that reproduced a portion of Tonto’s actual genetic

Tonto’s unique genetic signature

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GTGCCCCGGTCTGGGAGAGACAAACCAGGGAAGGCCGGCANNAG
AGAGAGAGAATTTTAAACCCCTCTCAAAAGGGTTTCCAGAACCAGATTTTA
GGGTGAGCCTCTAAGGGTCTTAGTTAGGGGCTGAAAAGGAGCCTCCAGT
TCCAGAAGGAAGGCCTCCACAATCAGGGACNNCCATCCCCTCTCCTCCG
GTAAAGTTACAATTTAGCCACTCAATTAAGAAAATTTTGTCTCTTAGA
AGGTCGGATAAACAGAGTCAAGGAGGGGGAGTTTAGAGTTAGGGAGAG
AAACAGTCTCTCCAAGAGAACCACGGAGTCCCTAGGCCAAAGTTAGTTA
GAGAGTTTCCAGTCTTCCGGTCCGGTCCGAGAGTCCAGGGAGGGTCCGGT
GCCAGGAGTTGGAGTAAAAATCTGGTTAAAGAGTCCGGTTAGTTAA
GCTCCTCAATCAATCTCCTTTGAAAATCTCCTCCCCACGGGGGAAA
ACCAGAAAAATCAATGGGCCGGTCCGGTCCGGGGTGGGGAAAA
AGAGGGGGAGGGAGCCCGGCCAGTTAAGGAAGGCCAAAGGGTCCGGAA
AGTCCCTTTTCAACCTTTTCCGCCCTTAGAGTGCCTCAAGGTTTTCCAGT
CAGTTTTGGTTAACGGAAACCAAGGAAGGTGAGAGAAGGCCAAAGGGAGT
CAAAGCGAGCCAACTGAGGGTCCAGTGGGTTTCAGACCCGGCCAG
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This is a portion of the code - or 'fingerprint' - from your dog's DNA that we use as a unique identifier.

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signature – a unique string of 300 capital letters. I was wowed by the science, but still this didn’t tell me anything. To find Tonto’s ancestry, I needed the next page.

Here was a pie chart with three slices. Half of the pie was blue, a big chunk was green, and the final slice was orange. My eyes dropped to the key, which told me what I’d been itching to know – Tonto is 50 per cent Yorkshire Terrier and 37.5 per cent Miniature Schnauzer. The final segment was the big surprise – one-eighth Border Terrier.

On the next page were four generations of a family tree, with pictures representing Tonto’s long-lost relatives. I could point a finger at the Border Terrier and Miniature Schnauzer whose offspring – Tonto’s grandparent (Wisdom Panel doesn’t identify whether it’s a male or female ancestor) – helped to create my dog’s distinctive look and traits. Clicking through, I found descriptions of the three breeds Tonto is made up of, with a history of each type, behavioural traits, and silhouettes of ears, muzzle and tail. All three were said to be intelligent – which definitely fits with what I see in Tonto!

MODERN TECHNOLOGY

The reason for the popularity of dog DNA tests became clear to me. Wisdom Panel, introduced in the US about 10 years ago, arrived in Britain only in 2012. It uses technology that came from a study, reported in the journal *Science*, which analysed 85 common dog breeds, using five purebred dogs of each breed. Most

breeds tested were found to have a unique DNA signature, despite the fact that many were created only within the last few centuries. This work showed that the distinction found between breeds is much higher than the distinction between human populations on different continents, and meant it would be possible to determine the breed of a dog based on a genetic sample.

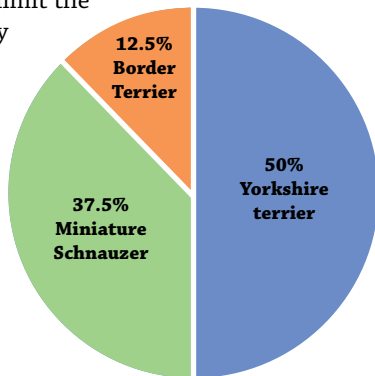
Dr Angela Hughes, Wisdom Panel's veterinary genetics research manager, said that while the original idea of using DNA markers to identify breeds came from a laboratory in the US, most of the research and development work for the original Wisdom Panel was, in fact, done in Nottingham.

I asked Dr Hughes whether it was unusual to have only a few breeds in a non-pedigree dog.

"In the UK it's not uncommon to have the entire family tree filled, as we saw with Tonto – in part because you seem to have fewer mixes of mixes of mixes," she said.

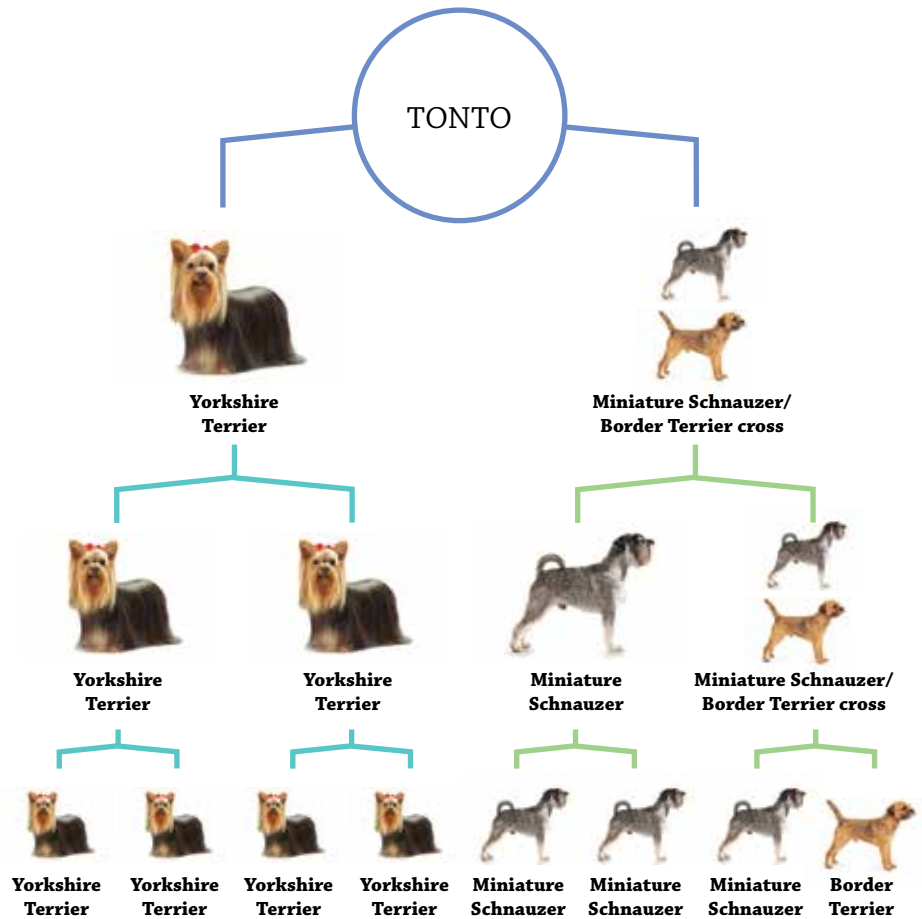
By contrast, in the US more than 10 per cent of tests come back with at least 50 per cent of DNA mixed beyond three generations – the limit the current technology can detect to.

The island nature of the UK (and, historically, our rabies laws) has limited the entry of canines, making it of particular interest genetically.



Top: Tonto's family tree.

Above: Tonto's ancestry pie chart.



Dr Hughes added, "We can pick out a dog that's from a UK line of Golden Retrievers or Labradors or Dalmatians, rather than the US line. You have your own unique sub-divisions of the populations."

However, with pet passports having made it much easier to transport dogs in and out of the country (not to mention the illegal smuggling of unregistered puppies through border controls), she doesn't expect the distinctions will stay for too much longer.

USEFUL KNOWLEDGE

Knowing Tonto's breed ancestry could be very useful, said Dr Hughes. If Tonto ever started intermittently limping (small-breed dogs – Yorkies in particular – are predisposed to luxating patellas, which can cause limping), awareness of the breeds Tonto has in him might help with diagnosis.

"This is information that can empower you and your veterinarian to make good decisions more quickly," she added.

Dr Hughes says her own experience shows how useful such information can be. Long before she worked in DNA testing, she had a rescue dog she thought was a Papillon. When he first became ill, it was unclear what was wrong.

It was only years later, after he had been diagnosed with epilepsy, that he was found to be a Cocker Spaniel crossed with a Maltese Terrier. Cocker Spaniels have an inherited form of epilepsy, and she believes earlier DNA analysis would have helped with the initial diagnosis because, as she put it, "I would have put epilepsy on my list of things to look out for."

At Battersea, which looks after thousands of dogs and cats each year, DNA testing isn't something that's routinely carried out. "We would encourage people to focus on personality rather than the breed, though of course we can understand why people might be intrigued to find out more," said the charity.

Looking back on my DNA quest, while I liked the mystery surrounding Tonto's ancestry, I also enjoyed solving it. One thing's for sure, though: in a test for doggieness – companionship and the ability to make people smile – mixed breeds like Tonto score 100 per cent. 🐾

For more about Wisdom Panel UK's range of DNA tests, go to www.wisdompanel.co.uk