

'How to fix a broken heart' – a new research project and potential early clinical trial on use of stem cells from a healthy canine heart to regenerate hearts with DCM – and how you can help make this work

This summary describes a project that, if successful, could lead to six-weekly stem cell injections for DCM that would restore hearts to normal size and function and enable dobes with DCM to live a healthy life for a normal life span. It also describes how clubs and individuals can contribute to its success.

The project

Dilated cardiomyopathy (DCM) is very prevalent in Dobermanns and is considered to have an underlying genetic basis. Whilst, in principle, it would be ideal to identify the relevant genes and then develop a test so that DCM can be bred out, this is unlikely to happen for several reasons. The first is that this is almost certainly a complex genetic issue involving multiple genes, perhaps in varying combinations. The second is that DCM is so prevalent in Dobermanns (at least 58%; probably more) that the potential to remove all dogs at genetic risk from the breeding population, even if this were possible, would leave too small a gene pool and would probably cause other genetic issues to emerge.

At present, testing can aid owners to pick up on occult (hidden, symptomless) DCM; treatment with pimobendan and other drugs can then delay the onset of symptoms and prolong healthy life. However, the dogs will still progress eventually to congestive heart failure (CHF) or sudden death. There is currently no treatment available that actually cures, or even prevents progression of DCM so that the dog will continue healthily to a normal life expectancy.

Dr David Connolly of the Royal Veterinary College (RVC) and colleagues have been researching the potential for use of canine stem cells to help the heart to regenerate and repair itself. Dr Connolly's team has already carried out a project to test in vitro whether canine heart cells from one dog can be tolerated when injected into another. This project was successful and the team have now obtained further funding from the Pet Plan Charitable Trust for a three-year project which should start in early 2019.

Research with human and rodent stem cells has shown that the success of stem cell therapy is significantly improved by growing the cells in hypoxic conditions, ie in a low-oxygen environment. The project will evaluate the use of this technique with canine heart cells and may, if successful, include an early 'proof of concept' clinical trial in Dobermann dogs with DCM.

What the dobermann community can do to help

The RVC already have a special hypoxic incubator to grow the cells in, but the experiments on those cells cannot be done in this chamber. The results are likely to be much improved if the experiments can be done inside a hypoxic chamber, which would keep the cells in a low-oxygen environment when outside of the incubator. This is likely to cost about £11,000. If Dr Connolly's team can raise, say, two-thirds of this through external donations (ie from us, the dobermann clubs, owners and breeders), then the RVC will supply the rest.

So, here is our chance to do something amazing for our breed – to make a real contribution to a research project that could lead to stem cell therapy to mend the dobes' (and their owners') broken hearts.