



## Information about research on lumbosacral transition vertebrae in the Belgian and Dutch Shepherd

### What is the purpose of this study?

In some dog breeds, an change in the anatomy of the vertebrae at the transition from the lumbar to the sacral region may occur. These changes predispose to lesions of the last intervertebral disc and may lead to compression and inflammation of the nerves in the spinal canal. This painful disease is termed cauda equina syndrome (CES) or degenerative lumbosacral stenosis (DLSS). In Belgian and Dutch Shepherds and other predisposed breeds, an X-ray examination of the spinal column is routinely performed during the hip dysplasia (HD) examination and the status of the lumbosacral transition vertebrae (LTV or LÜW) is recorded. LÜW 0 indicates a regular anatomy, while different alterations from the norm are indicated with LÜW 1 - 3. The exact mode of inheritance of this trait is unknown. Together with Prof. Dr. Frank Steffen of the Department of Neurology of the University Small Animal Hospital in Zurich we would like to investigate the genetics of lumbosacral transition vertebrae in Belgian and Dutch Shepherds. For the research we need radiographs (to evaluate the spine) and EDTA blood samples (to isolate DNA). We therefore ask breeders and owners to donate samples for our research.

### Which samples should I submit?

We need samples from cases (LÜW 1, LÜW 2, LÜW 3) and controls (LÜW 0). Complete families of litters with several affected littermates are especially valuable for the research (complete family = both parents & all littermates). For each sample dog, we ask for:

- EDTA blood sample (preferably 5 ml, at least 2 ml)
- Copy of the LÜW result (is normally done together with the HD result)
- Ventrodorsal radiograph showing the lumbosacral transition (at least the last 3 lumbar vertebrae & all sacral vertebrae)
- Completed and signed consent form
- Copy of the pedigree

### How is the research coordinated between Prof. Dr. Frank Steffen (University of Zürich) and Prof. Dr. Tosso Leeb (University of Bern)?

Prof. Dr. Frank Steffen is a board-certified neurologist (ECVN-Dipl.) and head of the Neurology Department of the University Small Animal Hospital in Zurich. He studied lumbosacral transition vertebrae clinically and radiologically over many years. Prof. Dr. Tosso Leeb has expertise in molecular genetics and a laboratory with the most modern equipment for DNA sequence analysis. The blood samples and radiographs should be sent to Bern and will be centrally collected in Bern. All data are regularly exchanged between the two institutions. Sarah Kiener is veterinarian and doctoral student at the Institute of Genetics in Bern. She will perform the actual genetic research experiments.

As a small thank you for your participation in our study, we will send you a free evaluation of your dog's x-ray. Please note that our evaluation of the x-ray happens within the framework of the scientific research project on LTV and we use our own evaluation scheme, which slightly differs from the official evaluation scheme for breeding suitability. For this reason we do not issue official opinions. Since we are primarily involved in research, it is unfortunately not possible for us to answer any further questions regarding the findings. If you wish a second opinion, please contact a radiologist / official reviewer for LTV. Findings of official reviewers may differ from our findings. In such cases, the official reviewer's findings always apply.

### Who can help me if I have questions about the research or sample submission?

If you have questions or comments in relation to this study, do not hesitate to get in contact with the Institute of Genetics of the University of Bern. Direct contact person regarding sample submission: Sarah Kiener, Institute of Genetics, Email: [sarah.kiener@vetsuisse.unibe.ch](mailto:sarah.kiener@vetsuisse.unibe.ch), Tel. +41 (0)31 684 25 24. All information will be treated confidentially.