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# Reactogenicity evaluated via magnetic resonance imaging and pathological examination in pigs

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Local reactions after vaccination are common, if inactivated vaccines are used. This study evaluated local reactions after vaccination of inactivated commercial vaccines in pigs. Magnetic resonance imaging (MRI) was used, in order to evaluate an alternative method to the gold standard histopathology, which is used in regulatory safety testing today. A number of 48 pigs (6 groups) were sedated and scanned repetitively via MRI at day 1, 3, 8, 15, 22 and 29 after vaccination. A contrast agent was applied to highlight tissue changes. MR images were evaluated semi-automatically by defining regions with increased signal intensity at the vaccination side according to defined grayscales in comparison to the signal intensity level at the control side. At the last examination day, the animals were euthanized and necropsied. Conclusively, the use of repetitive MR imaging over the whole examination period can determine the volume of local reaction and its progression over time, whereas the final histopathology of the injection site evaluates the kind of inflammatory reaction and an estimation of the extent. A rank correlation procedure yielded a significant relationship between the contrast agent MR images (volume measurements) and histopathology extent ($r_s \geq 0.32$). The use of MRI for regulatory safety testing can reduce the number of animals needed, because repetitive examinations at the live animal are possible and a volume of local reaction can be evaluated. Finally, subsequent pathological examination is needed to identify the character and local distribution of the reaction.

## Biography

Maren Bernau studied Veterinary Medicine at the Justus-Liebig-University in Giessen, Germany. She completed her Doctoral thesis in 2011 at the Ludwig-Maximilians-Universität (LMU) München, Germany. She is working as a Post-doc at the Livestock Center, using imaging methods like magnetic resonance imaging, dual-energy x-ray absorptiometry and ultrasound in the field of animal production. Her studies aim at establishing alternative imaging methods for regulatory studies in large animals. Additionally, she uses imaging methods to evaluate body or carcass composition of farm animals and in clinical research topics.

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