

Host genotype: a new target for control of *Staphylococcus pseudintermedius* skin infections in dogs?



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Background and motivation

- *Staphylococcus pseudintermedius* is part of the normal bacterial flora in dogs residing in skin and mucous membranes including the mouth and nose. This bacterium is also considered a main cause of bacterial skin infections in dogs.
- *Staphylococcus pseudintermedius* skin infections are often treated with antibiotics. However, since ~2005 new multidrug-resistant variants, called methicillin-resistant *S. pseudintermedius* (MRSP), have emerged. These can be impossible to combat with antibiotics.
- Veterinarians cannot expect new drugs for treating MRSP infections in the near future, and solutions towards prevention of MRSP are therefore needed. **The idea behind this project was that MRSP infections potentially can be prevented by breeding for dogs that are not colonized by *S. pseudintermedius*.**

Methods

- 63 labrador dogs from Sweden (n=31) and Denmark (n=32) were enrolled. Dogs had been previously genotyped using blood samples taken as part of another project (<http://www.eurolupa.eu>).
- Swab samples were taken by owners from the mouth and perineum of dogs on 3 occasions within 2 months. These were sent to a laboratory and cultured for presence of *S. pseudintermedius*. Information on dogs' current or previous skin infections were also sent by the owners.
- Dogs were classified as either permanent carriers of *S. pseudintermedius* (positive on all sampling occasions), intermittent carriers (positive once or twice), or non-carriers (never positive).
- Data on *S. pseudintermedius* carriage status were correlated with (i) symptoms of skin infection, and (ii) the dogs' genotypes.

Objectives

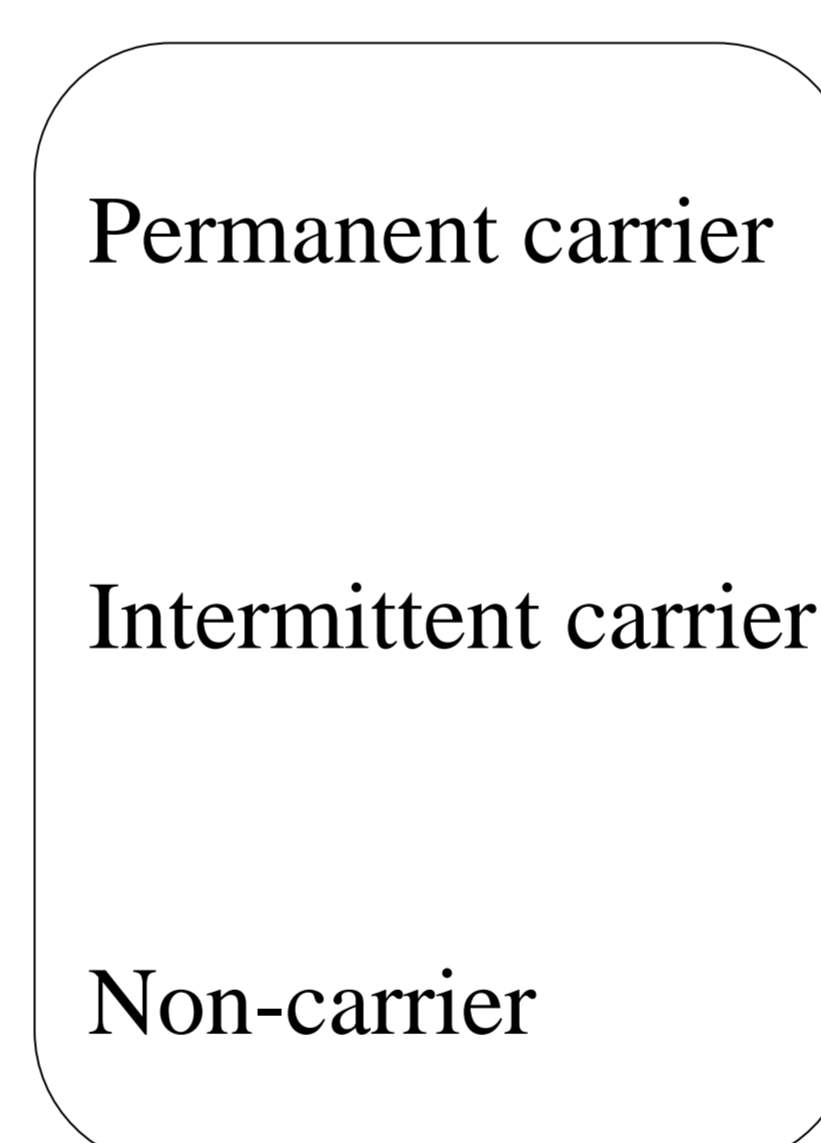
- To determine whether the *S. pseudintermedius* carriage status in dogs is related to:
 - Presence of skin infection or symptoms related to skin infection
 - Host genotype



1. Sampling of dogs



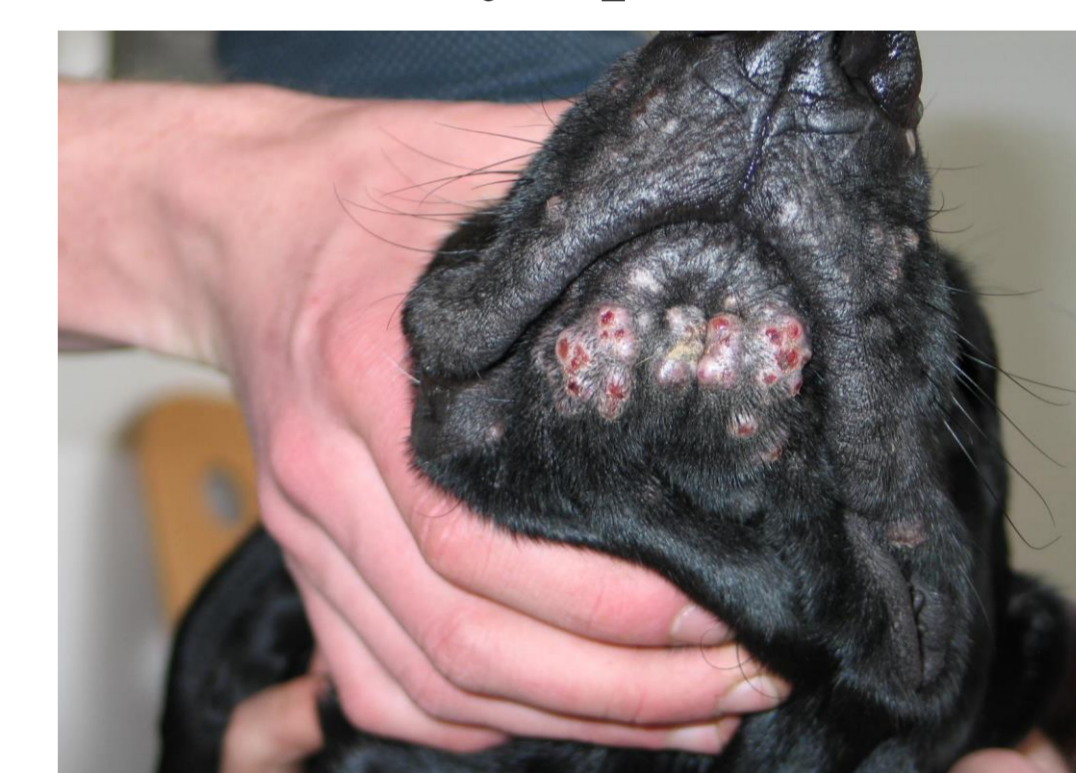
2. Culture for *S. pseudintermedius*



3. Classification of dogs

4. Relate carrier status to...

Skin symptoms



Host genotypes

Results

- Carriage of *S. pseudintermedius* is displayed in the table.
- Only three dogs (5%) had a skin-related disease during sampling, and this number was too low to relate to carriage status.
- For eighteen (29%) dogs, symptoms of skin infection had occurred at some point in life. Most of these (17/18) were permanent or intermittent carriers, but apart from this trend no associations were detected between *S. pseudintermedius* carriage and skin problems.
- A genome wide association study revealed no association between the dogs' genotype and the *S. pseudintermedius* carrier status.

Classification of dogs	Number of dogs (%)
Permanent carriers	33 (52%)
Intermittent carriers	20 (32%)
Non-carriers	10 (16%)

Acknowledgements

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Discussion and conclusions

- The study does not support previous evidence that *S. pseudintermedius* carriage is associated with canine skin infection. This result is likely an artefact because of;
 - The relatively low sample number and rare occurrence of skin problems during the study period.
 - The difficulty in classifying dogs as having infectious skin disease, especially on the retrospective analysis.
- The study did not show any association between *S. pseudintermedius* carriage and dogs' genotype. Although this needs to be validated in a larger population of dogs, the result indicates that selective breeding for dogs not colonized by *S. pseudintermedius* is not possible.