

NETosis during Influenza: A potential risk factor for severe bacterial co-infection in pigs?

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Influenza-A-viruses (IAV) may cause flu affecting the respiratory tract of humans, poultry and pigs. Co-infections with pathogenic lung bacteria are common and contribute to the severity of disease progression. Neutrophils are recruited to the site of infection where they can release neutrophil extracellular traps (NETs) to counteract invading pathogens. NETs consist of a DNA backbone spiked with antimicrobial components. Degraded NETs contain growth factors that enhance the growth of *Pasteurellaceae* bacteria.

We aimed to investigate whether IAV induce NETs in neutrophils and thereby initiate the growth of pathogenic lung bacteria. Bronchoalveolar lavage fluids (BALF) from diseased pigs (IAV-positive and -negative) was biochemically and microbiologically characterized and their influence on bacteria, neutrophils and the host-pathogen interaction studied.

We detected vesicular NETs, a specific release of NETs by viable neutrophils, in BALF of IAV-positive pigs by electron microscopy and an increase in NET-markers as H3Cit. Our data indicate that *Pasteurellaceae*, as *Actinobacillus pleuropneumoniae*, receive a growth boost from IAV-positive BALF. Furthermore, IAV-positive BALF has an inhibiting effect on the respiratory burst of neutrophils.

In combination with the finding that neutrophils fail to kill *Pasteurellaceae*, we conclude that factors, such as NETs, released by neutrophils during an IAV infection in pigs, contribute to the origin of a bacterial co-infection.

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Junior Scientist Status

Yes, I am a Junior Scientist.

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