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### Population biology of zoonotic *Streptococcus suis* in the production and supply chain of pork in China

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*Streptococcus suis* (SS) is an important zoonotic pathogen of pigs with global relevance to pig productivity and human health. Human SS disease was first described in the 1950s in Europe, but current interest lies in the role of SS in outbreaks of toxic shock-like syndrome in China and in meningitis in Vietnam, Thailand and Hong Kong. Most human gets infected with SS through close contact with the production and supply chain of pork. Strategies for SS control are needed to protect human health and to reduce dependence of pig production on antimicrobials.

To identify control points for the prevention of SS related disease in pigs and humans, longitudinal studies on tonsil samples were collected from 10 pig farms, and on consumer-ready pig-meat samples from small abattoirs, wet- and super-markets were performed. 211 SS isolates have been identified from 500 tonsil swabs of healthy pigs. PCR-based most-probable number (MPN) was used to evaluate the SS contamination in the meat samples. The contamination rate was up to 90% in the samples from small abattoirs, higher than that from wet- and super-markets (84% vs. 70%). The concentration of SS ranged from 0 to 1100 MPN/g of meat, kidney and intestine, and 0 to 35 MPN/g of liver from the small abattoirs. It was much lower in the meat (0 to 15 MPN/g) and liver (0 to 460 MPN/g) from the wet- and super-markets. The antimicrobial resistance profile (for 23 kinds of antibacterial drugs) was investigated. All the isolates displayed resistance to 3-14 drugs. The biochemical reaction profiles and serotypes of the isolates are currently being characterized. Whole genome sequences of the isolates will be compared to those obtained from pig meat products and those available from human isolates. Risk factors for carriage of SS on consumer-ready pig-meat will be investigated. The genes that underpin environmental survival of SS in the context of farm, abattoir and meat products will be identified by using transposon directed insertion site sequencing (TraDIS). This shall provide guidance to new control points for disease prevention by shedding light on strain diversity, fitness, and antimicrobial resistance along the production and supply chain.

#### Biography

Rui Zhou got his PhD from the University of Munich Germany in 2003. Currently he is the professor of Veterinary Bacteriology & Infectious Diseases, the Dean of Department of Preventive Veterinary Medicine, and the Director of Laboratory Animal Center, Huazhong Agricultural University, the Vice-director of Key Laboratory of Veterinary Diagnosis, Ministry of Agriculture of China, and the chief scientist of the National Basic Research Program of China. He has published more than 50 papers in international journals, and developed and commercialized two veterinary vaccine and diagnostic kit. This work is supported by the National Basic Research Program of China (2012CB518802), and the International S & T Cooperation Program of China (2013DFG32360).

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