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研究方向：动物及人兽共患疫病病原学、细菌及病毒致病机理、病原与宿主互作关系、动物疾病防控

个人简介：

姚火春：男，1963年2月出生，籍贯浙江湖州

研究工作经历：

2009/12-至今，南京农业大学，动物医学院预防兽医系，教授

2006/10-2006/12，德国,Erlangen-Nuernberg 大学，合作科研

2005/11-2006/01，德国,Erlangen-Nuernberg 大学，合作科研

2003/02-2003/05，德国,InWent 研究所，兽医流行病学培训

1997/09-2009/12，南京农业大学，动物医学院预防兽医系，副教授

1992/09-1997/09，江苏省太仓市畜牧兽医站，兽医师、高级兽医师

1987/09-1992/11，南京农业大学，动物医学院预防兽医系，助教、讲师

受教育经历：

1999/09-2009/12，南京农业大学，动物医学院预防兽医系，博士

1984/07-1987/08，南京农业大学，兽医系，硕士

1980/08-1984/07，北京农业大学，兽医系，学士

姚火春，现任南京农业大学动物医学院教授，博士生导师，世界动物卫生组织猪链球菌病参考实验室主任、预防兽医学教学实验中心主任。1984年毕业于北京农业大学兽医系，1987年于南京农业大学兽医微生物学与免疫学专业硕士毕业，2009年12月获博士学位。多年来一直从事兽医微生物学与免疫学的教学与科研工作，在兽医微生物的病原学、诊断技术、致病机理及免疫预防等方面具有丰富的经验，作为通讯作者发表SCI论文近30篇。主讲动物医学本科“兽医微生物学”和研究生的“高级兽医免疫学”等课程，参与建设的“兽医微生物学”被评为国家级精品课程，主持建设的“兽医微生物学”被评为国家级资源共享精品课程。任“江

苏省免疫学会”、“江苏省畜牧兽医学会”、“江苏省禽业协会”和“中国畜牧兽医学会兽医公共卫生分会”理事。

科研项目：

- (1)国家自然科学基金面上项目，31372455，应用基因组学和蛋白组学研究禽致病性大肠杆菌 VI 型分泌系统效应因子的作用机制，2014/01-2017/12，85 万元，主持
- (2)教育部博士点基金，20130097110019，鼠源 Ptx3 蛋白的真核表达及其对感染猪链球菌 2 型小鼠保护机制的研究，2014/01-2016/12，12 万元，主持
- (3)农业部 948 项目，2014-S11，应用于猪链球菌等动物病原保护性抗原筛选的 "En-passent"修饰技术的引进，2014/01-2014/12，60 万元，主持
- (4)公益性行业（农业）科研专项，201303041，猪链球菌病防控技术研究，2013/01-2017/12，1553 万元，首席专家
- (5)国家转基因专项，2009ZX08009-1546，猪抗重要病原微生物抗病基因的克隆、鉴定子项目一小鼠抗猪链球菌 2 型基因筛选，2009/01-2010/12，34 万元，主持
- (6)公益性行业（农业）科研专项，200803020，猪鸡主要疫病综合免疫技术研究与示范子专题，2008/01-2010/12，246 万元，主持
- (7)公益性行业（农业）科研专项，200803016，猪链球菌病生物灾害防控技术研究与示范，2008/01-2010/12，1860 万元，参加
- (8)国家自然科学基金面上项目，30671558，应用绿色荧光蛋白标记研究猪链球菌 2 型感染机制，2007/01-2009/12，26 万元，主持

荣誉奖项：

- (1)“嗜水气单胞菌毒力因子的研究”，教育部科技进步二等奖（第三完成人）；
- (2)“猪链球菌病研究与防控技术”，国家科技进步二等奖（第四完成人）。
- (3)“猪链球菌病快速诊断与免疫预防及其致病机理研究”江苏省科技进步二等奖（第四完成人）。
- (4)“猪链球菌病灭活疫苗（马链球菌兽疫亚种+猪链球菌 2 型）的研制”上海市技术发明二等奖（第四完成人）。

发明专利：

- (1)姚火春，张炜，潘子豪，胡伟娟，全基因合成鸡 α 干扰素基因及蛋白表达，2010.12.29，中国，201010125002

(2)姚火春, 张炜, 潘子豪, 胡伟娟, 全基因合成鸭 α 干扰素基因及蛋白表达, 2010.10.27, 中国, 201010125041

(3)姚火春, 张炜, 潘子豪, 胡伟娟, 全基因合成犬 α 干扰素基因及蛋白表达, 2010.08.11, 中国, 201010125025

专著:

(1)主编《兽医微生物学实验指导》(第二版);

(2)副主编《动物免疫学》(第二版);

(3)参编《兽医微生物学》第三、四、五版、《现代中国养猪》及《现代实用兽医词典》。

近年代表性论著: *通讯作者

(1)Xiaojun Zhong, Yue Zhang, Yinchu Zhu, Wenyang Dong, Jiale Ma, Zihao Pan, Shipra Roy, Chengping Lu, Huochun Yao*. The two-component signaling system VraSRSS is critical for multidrug resistance and full virulence in *Streptococcus suis* serotype 2. *Infection and Immunity*. 2018, Epub ahead of print.

(2)Jiale Ma, Min Sun, Zihao Pan, Chengping Lu, **Huochun Yao***. Diverse toxic effectors are harbored by *vgrG* islands for interbacterial antagonism in type VI secretion system, *Biochimica et Biophysica Acta-General Subjects*. 2018, 1862(7):1635-1643.

(3)Jiale Ma, Min Sun, Zihao Pan, Wenchao Song, Chengping Lu, **Huochun Yao***. Three Hcp homologs with divergent extended loop regions exhibit different functions in avian pathogenic *Escherichia coli*, *Emerging Microbes & Infections*. 2018, 7(1):1-13.

(4)Wenyang Dong, Yinchu Zhu, Ye Ma, Jiale Ma, Yue Zhang, Lv Feng Yuan, Zihao Pan, Zongfu Wu, **Huochun Yao***. Multilocus sequence typing and virulence genotyping of *Streptococcus suis* serotype 9 isolates revealed high genetic and virulence diversity. *FEMS Microbiol Lett*. 2017, 364(22): 1-8.

(5)Jiale Ma, Min Sun, Wenyang Dong, Zihao Pan, Chengping Lu, **Huochun Yao***. PAAR-Rhs proteins harbor various C-terminal toxins to diversify the antibacterial pathways of type VI secretion systems. *Environmental Microbiology*. 2017, 19(1):345-360.

(6)Jiale Ma, Zihao Pan, Jinhu Huang, Min Sun, Chengping Lu, **Huochun Yao***. The Hcp proteins fused with diverse extended-toxin domains represent a novel pattern of antibacterial effectors in type VI secretion systems. *Virulence*. 2017, 8(7):1189-1202.

- (7)Min Sun, Zeyanqiu Yu, Jiale Ma, Zihao Pan, Chengping Lu, **Huochun Yao***. Down-regulating heat shock protein 27 is involved in porcine epidemic diarrhea virus escaping from host antiviral mechanism. *Veterinary Microbiology*.2017, 205:6-13.
- (8)Min Sun, Jiale Ma, Zeyanqiu Yu, Zihao Pan, Chengping Lu, **Huochun Yao***. Identification of two mutation sites in spike and envelope proteins mediating optimal cellular infection of porcine epidemic diarrhea virus from different pathways.*Veterinary Research*. 2017, 48(1):44.
- (9)Yinchu Zhu[#], Wenyang Dong[#], Jiale Ma, Lvfang Yuan, Hassan M.A. Hejair, Zihao Pan, Guangjin Liu, **Huochun Yao***.Characterization and virulence clustering analysis of extraintestinal pathogenic *Escherichia coli* isolated from swine in China. *BMC Veterinary Research*. 2017, 13(1):94.
- (10)Zihao Pan, Ye Ma, Jiale Ma, Wenyang Dong., **Huochun Yao***. Acute meningitis of piglets and mice caused by co-infected with *Streptococcus suis* and *Aerococcus viridans*. *Microbial Pathogenesis*.2017, 106:60-64.
- (11)Zihao Pan, Jin Liu, Jiale Ma, Qiuli Jin, **Huochun Yao***, Nikolaus Osterrieder.The recombinant EHV-1 vector producing CDV hemagglutinin as potential vaccine against canine distemper.*Microbial Pathogenesis*.2017, 111:388-394.
- (12)Hassan M.A. Hejair, Yinchu Zhu, Jiale Ma, Yue Zhang, Zihao Pan, Wei Zhang, **Huochun Yao***. Functional role of ompF and ompC porins in pathogenesis of avian pathogenic *Escherichia coli*.*Microbial Pathogenesis*.2017, 107:29-37.
- (13)Hassan M.A. Hejair, Jiale Ma, Yingchu Zhu, Min Sun, Wenyang Dong, Yue Zhang, Zihao Pan,Wei Zhang,**Huochun Yao***. Role of outer membrane protein T in pathogenicity of avian pathogenic *Escherichiacoli*.*Research in Veterinary Science*.2017, 115:109-116.
- (14)Zihao Pan[#], Jiale Ma[#], Wenyang Dong, Wenchao Song, Kaicheng Wang, Chengping Lu*, **Huochun Yao***. Novel variant serotype of *Streptococcus suis* isolated from piglets with meningitis.*Applied and Environmental Microbiology*. 2015, 81(3):976-985.
- (15)Min Sun, Jiale Ma, Yanan Wang, Ming Wang, Wenchao Song, Wei Zhang, Chengping Lu, **Huochun Yao***. Genomic and epidemiological characteristics provide new insights into the phylogeographical and spatiotemporal spread of porcine epidemic diarrhea virus in Asia. *Journal of Clinical Microbiology*. 2015, 53(5): 1484-1492.
- (16)Wenyang Dong[#], Jiale Ma[#], Yinchu Zhu, Jieliang Zhu, Lvfang Yuan, Yanan Wang, Jueqiong Xu, Zihao Pan, Zongfu Wu, Wei Zhang, Chengping Lu, **Huochun Yao***. Virulence genotyping and

population analysis of *Streptococcus suis* serotype 2 isolates from China. *Infection Genetics and Evolution*.2015, 36:483-489.

(17)Jueqiong Xu, Yanjuan Mu, Yue Zhang, Wenyang Dong, Yinchu Zhu,Jiale Ma, Wenchao Song, Zihao Pan, Chengping Lu, **Huochun Yao***. Antibacterial effect of porcine PTX3 against *Streptococcus suis* type 2 infection. *Microbial Pathogenesis*.2015, 89: 128-139.

(18)Hongying Jia, Wenyang Dong, Lvfang Yuan, Jiale Ma, Qinqin Bai, Zihao Pan, Chengping Lu, **Huochun Yao***.Characterization and complete genome sequence analysis of *Staphylococcus aureus* bacteriophage JS01. *Virus Genes*. 2015, 50(2):345-8.

(19)Jiale Ma, Yinli Bao, Min Sun, Wenyang Dong, Zihao Pan, Wei Zhang, Chengping Lu, **Huochun Yao***. Functional type VI secretion systems in avian pathogenic *Escherichia coli* are involved in different pathogenic pathways. *Infection and Immunity*.2014, 82:3867-3879.

(20)Jiale Ma, Min Sun, Yinli Bao, Zihao Pan, Wei Zhang, Chengping Lu, **Huochun Yao***. Genetic diversity and features analysis of type VI secretion systems loci in avian pathogenic *Escherichia coli* by wide genomic scanning. *Infection Genetics and Evolution*.2013, 20:454-464.

(21)Jia Hongying, Bai Qinqin, Yang Yongchun, Huochun Yao*.Complete Genome Sequence of *Staphylococcus aureus* SiphovirusPhage JS01. *Genome Announcements*.2013, 1(6): e00797-13

(22)Tao Chen, Qin Huang, Zhaolong Li, Wei Zhang, Chengping Lu, **Huochun Yao***. Construction and Characterization of a *Streptococcus suis* Serotype 2 Recombinant Expressing Enhanced Green Fluorescent Protein. *PLoS one*. 2012, 7(7):1-10.

(23)Jie Rong, Wei Zhang, Xiaohui Wang, Hongjie Fan, Chengping Lu, **Huochun Yao***. Identification of Candidate Susceptibility and Resistance Genes of Mice Infected with *Streptococcus suis* Type 2. *PLoS one*, 2012, 7(2), 1-12.

(24)Lei Wu, Ya-nan Jiang, Qian Tang, Hui-xing Lin, Cheng-ping Lu, **Huo-chun Yao***. Development of an *Aeromonas hydrophila* recombinant extracellular protease vaccine. *Microbial Pathogenesis*.2012,53:183-188.

(25)Wei Zhang, Jing Shao, Guangjin Liu, Fang Tang, Yan Lu, Zhipeng Zhai, Yang Wang, Zongfu Wu, **Huochun Yao*** and Chengping Lu. Immunoproteomic analysis of bacterial proteins of *Actinobacillus pleuropneumoniae* serotype 1. *Proteome Science*. 2011, 9:32, 1-11.