



中國農業大學  
China Agricultural University

## Workshop on Pathology and Mechanisms of Disease China Agricultural University, July 15-18, 2019

Monday, July 15

### Opening Ceremony:

The Secretary the CAU Veterinary School (Dean-equivalent) opened the ceremony, and welcomed the participants. Then several company representatives, all involved with livestock or diagnostic enterprises, took the podium and voiced their support of the course. Dr. Xiangmei Zhou, who is hosting the course, thanked the Davis-Thompson Foundation for providing the speakers. Collaboration between CAU and the Foundation began in 2018, with the first course held last December. That course focused on pathology of swine diseases, and attracted 180 attendees. The current course now, on Mechanisms of Disease, is smaller, due to the inclusion of a wet lab. Another course, on Gross Pathology, is scheduled for October.



The group overall was very heterogeneous and consisted of: teachers, diagnosticians, pathologists, clinicians, graduate students, and various professionals from industry. To help

ensure group learning, Corrie and Tiffany distributed colored nametags, according to the occupation, and created 9 tables of participants, each with a variety of backgrounds.

**Learning Objectives** were reviewed (below) and posted on the wall in Chinese.

*At the end of the workshop, participants will be able to:*

1. Perform a necropsy on a bird or a pig, collecting and packaging tissues in an appropriate manner for use in the laboratory
2. Identify specific mechanisms of disease through gross lesions, and form a list of differential diagnoses
3. Be able to conduct downstream training on basic mechanisms of disease

Every participant was introduced.

The group nominated **class officers**, and these names with their responsibilities were posted:

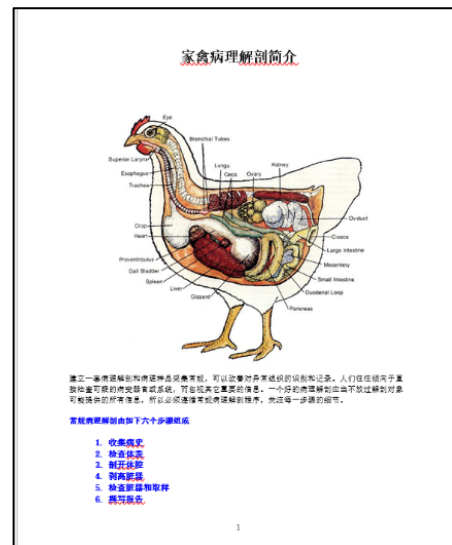
- Leader: Yao Yong Jin
- Time Keeper: Guo Dong Ha
- Welfare Officer: Chen Shi Bin

Corrie asked the group to consider what is most needed in order to be able to better diagnose animal diseases in China. Major answers were as follows:

- Detailed info given to diagnosticians
- Necropsy and examine feed and water sources in addition to animal
- Collection of appropriate samples by the producer
- Necropsy and photo → let lab decide on testing
- Epidemiological survey (although not clear what type)
- Knowledge and concepts of biosecurity

Tiffany reviewed the “**Six Steps to a Successful Necropsy**”. Everyone had a copy of the avian necropsy procedure in Chinese, to follow, as they completed a necropsy on a chicken.

Groups judged others’ sample collections and necropsy reports and discussed how a full set of samples and a detailed report could be most helpful in the laboratory.





The group reconvened in the classroom to begin **Disturbances of Circulation**. Corrie asked each table to list the major components in Disturbances of Circulation, and wrote them on a flipchart. Then each table was given one of those components to teach to the class (Hyperemia; Congestion; Hemorrhage; Edema; Thrombosis; Embolism; Infarction). After each presentation, the group worked through cases, to help cement the information. These cases were presented as individual laminated photos (with history/questions in Chinese) and had been printed into a booklet by Dr. Xiangmei.

A sheep is very lethargic and develops this swelling in the submandibular space. It dies and you find many blood-filled parasites in the abomasum (*Haemonchus*). 一只绵羊很嗜睡，下颌下间隙有肿胀。死后发现在皱胃 (*Haemonchus*) 中有许多充满血液的寄生虫。

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- What is likely to be within this fluid-filled submandibular space?  
在下颌下间隙的液体中可能有什么?
- Which of the 4 mechanisms of edema is operating here? 最有可能4种水肿机制中的哪一种?



**Tuesday, July 16**

Corrie reviewed the **key principles of adult learning**

- Social – Adults learn best when they discuss with each other
- Problem based – Solving problems helps to put information into long-term memory
- Mutual respect – There must be a good and trustful relationship between instructor and learner
- Warm environment – Emotional comfort is essential; story-telling helps
- 15 minute rule – Over the course of 15’, about 7 “chunks” can be stored in short-term memory. If there is not a subsequent short period to allow for that information to be transferred to the long-term memory (brief exercise), then the short-term memory is “wiped clean” as new information comes in.

We continued with the cases demonstrating various aspects of Disturbances of Circulation.

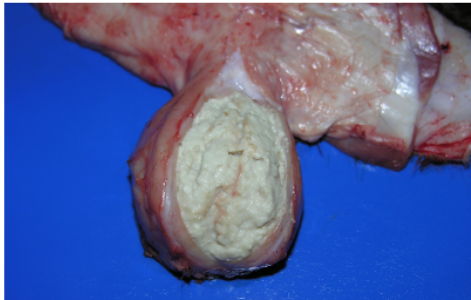
## Degeneration and Necrosis

The class defined necrosis and then worked through several cases.

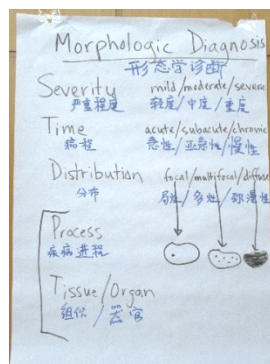
## Inflammation

We worked through time course of inflammation, exudates, and inflammatory cells. There were three sets of scenarios – basic inflammation, to include morphologic diagnosis and pathogenesis; identification of cell types in blood smears and correlation with function; preliminary identification of inflammatory cells in histology photos and what the presence of that cell means.

- Umbilical vein of a young calf that has been doing poorly since birth.  
This exudate is PUS. 这是个一出生就不健康的小牛的脐静脉。
- What is your morphologic diagnosis? 有脓状分泌物。 形态学诊断?
  - How do you think this happened? 你怎么看待这件事?
  - Why is the animal continuing to do so poorly? 为什么小牛会持续不健康?



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## Wednesday, July 17

In the morning, all pathologists and instructors were asked to stand, and were then asked to move to a new table, to increase networking.

## Disturbances of Growth

- Tiffany presented various concepts in Disturbances of Growth – hypertrophy, hyperplasia, dysplasia, metaplasia.
- Group work entailed characteristics of benign vs malignant tumors.
- Tiffany reviewed some projected scanned tumors, pointing out features of malignancy, and discussed how scanned slides could be utilized.



## Impression Smear Cases

Corrie had 6 infectious diseases cases in which diagnosis was made on impression smear. The group reviewed these. Many of the laboratories in China (at least those represented at this

course) have access to histopathology, and most people were unaware of how to use impression smears, other than for clinical presumptive diagnosis in excised small animal tumors.

## Pig Diseases –

We worked through 5 pig cases – Erysipelas, ASF, hpPRRS, and FMD, PCV.

For each, participants worked in groups to solve various aspects of the cases, and to consider the pathogenesis. Then Corrie reviewed the pathogenesis using flip charts.



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一些3个月大的猪，皮肤上有许多钻石图案红色斑和坏死的区域。猪不愿意四处走动，有些已死亡。

3.5-month-old pigs are developing multiple areas of skin reddening and necrosis, often with a diamond pattern. Animals are reluctant to move around and some are dying

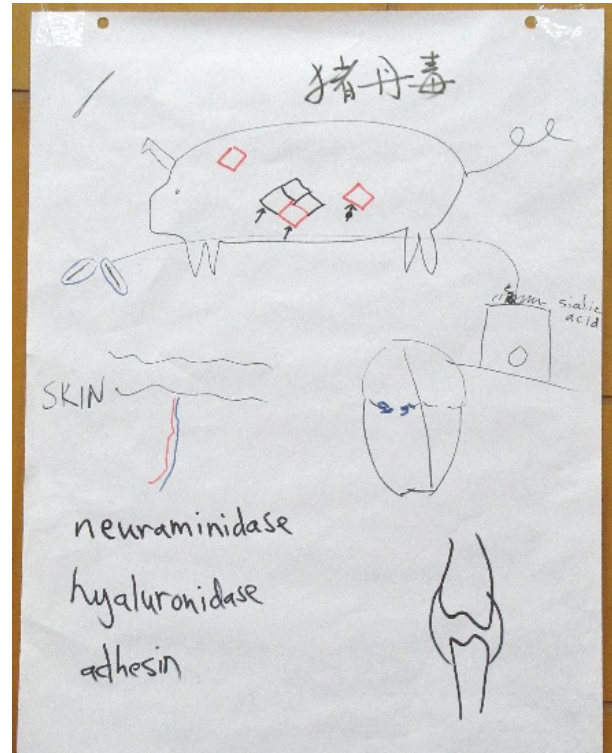
Please answer the following questions about this case:

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1. What is the most likely organism seen on the impression smear? How is it characteristic?
2. How is this agent causing disease? For the skin lesions? For the joints?
3. Are there any other organs where this bacteria might localize?
4. Can you clean this disease out of the herd? How?

请就此案例回答以下问题：

1. 在印模涂片上看到的最有可能的生物是什么？它的特点是什么？
2. 这种致病源是如何引起疾病的？如何导致皮肤病变？如何导致 关节病变？
3. 这种细菌还可能存在于其他器官吗？
4. 你能从畜群中清除这种疾病吗？怎么做？



At the end of Wednesday, we polled the group regarding what else they wanted covered, and created a list (see July 18 for these topics). We asked for volunteers to give a short lesson on many of these subjects on the following day, and to use adult learning principles.

## Thursday, July 18

Topics presented by participants -

- *Infectious coryza*, presented by Mark (producer) and Dr. Tienshang (veterinary pathologist with industry): The pair used a flip chart to compare/contrast infectious coryza and chronic respiratory disease. Format was interactive and effective.
- *Avian hematopoietic tumors* – Dr. Seven (diagnostician for poultry companies) explained the differing avian blood tumors, with case examples.
- *PCV2/PCV3* – Dr. Chen Bi Shen, swine veterinarian, gave an overview of these two pathogens and their evolving disease patterns.
- *Hematopoiesis* – Dr. Kwang Yu and Dr. Liao Shu had an interactive session helping people to understand the origin and lineages of various cell types from bone marrow.

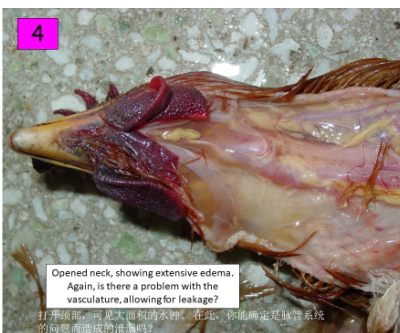
- *Dog skin tumors* – Dr. Meng Yu, PhD student in pathology, drew a histologic representation of normal skin and explained the various tumors that arise from each component.
- *Killed vs attenuated viral vaccines* – Dr. Leo (PhD student) and Yao Yong Jin (producer) reviewed the pro’s and con’s of these two major categories of viral vaccines, with examples.

After each presentation, there was Q&A, and also each table was asked to state one aspect of the presentation that was especially noteworthy and appreciated.

### Avian cases, with pathogenesis – ND, HPAI, CRD, IB, coccidia, pullorum disease



Group work on cases



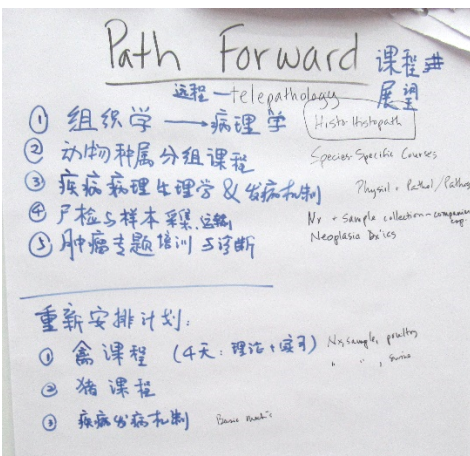
Example of part of avian disease scenario



Corrie demonstrating with volunteers how *Mycoplasma* disrupts cilia function

### “Path Forward Discussion”

Dr. Xiangmei asked Corrie to lead this discussion. Each table had to list two ideas that would be the most useful for the next workshop(s), and in that consideration, to think about what is most needed for the country, and what would provide the greatest benefit. These were then listed on a flip chart (top portion). After that, we discussed in more detail, to come to a consensus on priorities.



The 5 suggestions at the top included were subject to general discussion, and then at the bottom there were three priorities on which the group came to consensus, listed below in order of priority:

1. Necropsy, sample collection, and disease review for POULTRY
2. Necropsy, sample collection, and disease review for SWINE
3. Basic mechanisms of disease course (similar to the one described in this report) for a large group of YOUNG veterinarians.

There were quite a few who stated that what was needed was a workshop on basic histology and histopathology. However, after discussion, there was agreement that workshops will be unlikely

to produce experts in histopathology. Perhaps greater impact would be through some sort of telepathology, a long-term training program for those interested, to help them grasp more basic concepts and enable more on-site training. Consequently, “telepathology for learning histopathology” would be a fourth initiative, but not a workshop *per se*.

Corrie gave Dr. Xiangmei a template for evaluation (Appendix 1), which she translated to Chinese. Everyone completed it and she collected all the papers.

Awarding of certificates of attendance.

Banquet followed in the evening.

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Participants photographed the flip charts on pathogenesis



Tiffany with her fan club



Corrie and Tiffany visited the Teaching Hospital and found a.... PEKINGESE!



At the Great Wall, last day

**Appendix 1. Evaluation which was translated to Chinese and distributed.**

**Workshop on Mechanisms of Disease  
CAU, Beijing, China  
July 15-18, 2019**

Please rank items from 5 (excellent/strongly agree) to 1 (unsatisfactory/strongly disagree).

	strongly agree.....strongly disagree				
<b>Instruction</b>					
Learning objectives were accomplished	5	4	3	2	1
Instruction was of high quality	5	4	3	2	1
Laboratory exercise was valuable	5	4	3	2	1
Interactive group exercises were valuable	5	4	3	2	1
<b>Facilities and Organization</b>					
The CAU facilities met my needs	5	4	3	2	1
The pre-course organization was excellent	5	4	3	2	1

**If this course is given again, what is one thing you WOULD NOT change?**

**If this course is given again, what is one thing you WOULD change?**

**Please give us your ideas as to how the Davis-Thompson Foundation could further support veterinary pathology activities in China:**