

In this episode of The Wild Side of STEAM, we met Dr. Kali Holder, a veterinary pathologist at the Smithsonian's National Zoo and Conservation Biology institute. We learned how Kali looks for signs of disease and causes of death in animals.

ACTIVITY 1: What is a veterinary pathologist?

- 1. Watch the Wild Side of STEAM: Veterinary Pathologist webinar. If you missed the live event, the video recording is available on the Zoo's website: <u>https://nationalzoo.si.edu/education/zoo-webinars</u>.
- 2. Consider the following:
 - a. How can necropsies (animal autopsies) impact the health of living animals?
 - b. What is a biopsy and how is it important for identifying and treating diseases?
 - c. Why is it important for pathologists to collaborate with animal keepers?

ACTIVITY 2: How does a veterinary pathologist identify diseases?

We learned how important a microscope is for looking more closely at the internal organs of an animal. If the organs look abnormal, that could be a sign of disease. In this activity, you will compare normal slides to abnormal slides to identify a potential problem.

Activity continues on the following pages.





1. The following image is a sample of a normal kidney magnified about 100 times. We can identify it as a kidney sample because of the tubules and the spheres of vessels called glomeruli (labeled below).



The following image is another sample of a kidney. Compare it to the previous kidney image. Do you think this is a healthy kidney? Why? Explain how this sample looks similar or different.



2. The following image is a biopsy from a normal liver. We can identify it as a liver sample from the central vein surrounded by lines of liver cells leading away from it (labeled below). Livers have lots of veins like these and the lines of liver cells make it easy to identify.



The following image is a different liver sample, at a slightly higher magnification. Compare this sample to the previous one. Can you spot the abnormality? Explain what you observe.







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ANSWER GUIDE:

 The second kidney sample shows multiple abnormalities. You can see the glomeruli are destroyed and replaced with a bright pink stain (amyloid). The tubules are also too big and filled with a material called gout tophi. Additionally, there are more blue nuclei in between all the tubules. Those belong to white blood cells and mean that there is inflammation and damage. Amyloid and gout are common problems in birds. This sample was taken from an American flamingo.



 The second liver sample has too many vessels in this area, and they are abnormally large. This is called telangiectasia. It is not a dangerous change, but it happens often in cheetahs and some hoofstock. The sample in the activity was taken from a Dama gazelle. Below is another (larger) example from a cheetah.





