Using Artificial Intelligence to Analyze Kidney Biopsies from Nephrotic Syndrome

Pathologists usually look at the amount or types of tissue damage in a kidney biopsy under a microscope to diagnose kidney disease. Artificial intelligence is a new technology that can be used to train a computer to identify patterns in images, with applications like facial recognition in photographs or tissue structure identification in kidney biopsy images. The computer can help reliability or quickly identify important features in the biopsy tissue.

The computer might also find new signs of tissue damage that are not visible to the human eye. By pairing the computer’s power with pathologists’ expertise, artificial intelligence allows researchers to study a large number of kidney biopsy images in very little time.

How does the NEPTUNE study help?

The NEPTUNE study collects and stores kidney biopsy images from patients with nephrotic syndrome. A team of kidney pathologists, engineers, nephrologists, and statisticians worked together to apply an artificial intelligence method called “deep learning” to these images. They were able to train a computer to accurately find several different structures in the kidney tissue. Now, they will use similar methods to measure the amount of damage in these structures. They will then see if the information from the computer can accurately predict the observed clinical outcomes in NEPTUNE participants.

Eventually, a better understanding of the kidney tissue will help doctors and scientists learn more about kidney diseases so they can choose better treatments for their patients.

Visit our website: neptune-study.org

Please address any questions/suggestions to your coordinator to give to the NEPTUNE R&R Committee