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Research reveals clues to the formation of hearts, intestines and other key organs

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How do the intestines in tiny birds or large mammals form intricate looping patterns? How do hearts and vascular systems form? Why do some large dog breeds succumb to gastric torsion while others don't? Newly released research co-authored by a Cornell University assistant professor provides some key clues to these natural phenomena.

"This research gives us hints to looping morphogenesis, how organs form from a single tube to the rotating structure of intestines," said Natasza Kurpios, assistant professor of Molecular Medicine at the College of Veterinary Medicine at Cornell. Kurpios co-authored the study, "On the growth and form of the gut" in the current issue of *Nature*. Her co-authors are Thierry Savin, Amy E. Shyer, Patricial Florescu, Haiyi Liang, L. Mahadevan and Clifford J. Tabin, all of Harvard Medical School and Harvard University.

Kurpios and her co-authors developed a model that mimics how developing intestines in vertebrates form the characteristic looped pattern in the body cavity. That model not only provides a template for organ asymmetry; it also could lead to better diagnosis of veterinary and human maladies such as malrotation of the intestines in babies and gastric torsion in large-breed dogs such as Labrador retrievers. "By understanding the patterns of loops, we could better identify and more accurately diagnose these conditions," Kurpios said. "This also gives us hints to the formation of other organs, such as the heart and the vascular system."

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Provided by Cornell University

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