

# How to Make New Discoveries in (Human) Anatomy

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Despite the perception that human anatomy is a completed science, new discoveries continue to be reported. Some merely expand the previously known range of human variation, but others are gross structures present in most people, which simply escaped detection until recently. An analysis of recent discoveries suggests several avenues along which new discoveries might be sought:

1. Anatomically complex regions with multiple potential distractors: the anterolateral ligament of the knee escaped widespread appreciation until 2013, probably because the human knee is a forbiddingly complex structure that is rarely dissected completely, and several superficially similar structures are present in the same area.
2. Common characters of other taxa expressed as rare variants in humans: vagus nerve fibers to the trachea and esophagus are typically incorporated into the recurrent laryngeal nerve in humans, but form a separate recurrent pharyngeal nerve (RPN) in some other mammals, and rarely in humans.
3. Replaced peripheral nerves: nerve fibers from the 4<sup>th</sup> lumbar spinal level to the leg are usually incorporated into the femoral nerve, but in rare cases become part of the obturator nerve. In such cases, the posterior branch of the saphenous nerve appears to have been replaced by the obturator nerve. Similar replacements in other regions of the body are underexplored.

Most recent discoveries fall into a perceptual blind spot: medical students dissecting human cadavers have the opportunity to find these structures, but usually lack the expertise to recognize or preserve them. In contract, surgeons have the necessary expertise, but rarely have the opportunity to open people up sufficiently to identify or trace these structures.

If new discoveries remain to be made even in the well-trod ground of human anatomy, then many more surely await discovery in extant and extinct non-humans, and these guidelines may prove useful in other taxa as well.