



# **Autonomic Nervous System: Chapter 30. Skin biopsies in the assessment of the autonomic nervous system (Handbook of Clinical Neurology)**

*Ningshan Wang, Christopher H. Gibbons*

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Cutaneous punch biopsies are widely used to evaluate nociceptive C fibers in patients with suspected small-fiber neuropathy. Recent advances in immunohistochemical techniques and interest in cutaneous autonomic innervation has expanded the role of skin biopsy in the evaluation of the peripheral nervous system. The dermal layers of the skin provide a unique window into the structural evaluation of the autonomic nervous system. Peripheral adrenergic and cholinergic fibers innervate a number of cutaneous structures, such as sweat glands and arrector pili muscles, and can easily be seen with punch skin biopsies. Skin biopsies allow for both regional sampling, in diseases with patchy distribution, and the opportunity for repeated sampling in progressive disorders. The structural evaluation of cutaneous autonomic innervation is still in its scientific infancy, with a number of different methodologies and techniques that will require standardization and widespread acceptance before becoming a standard of care. Future studies of autonomic innervation in acquired, hereditary, neurodegenerative, or autoimmune disorders will be necessary to determine the clinical utility of skin biopsy in these disease states.

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