The traditional view
For centuries, itch and pain were presumed to be no more than different degrees of sensation — a belief based on assumptions that the central nervous system performs as a single conduit of generalized sensory information. Although this simple view no longer makes sense, making finer distinctions among complex neurochemical functions still pushes the limits of human understanding — and technology.

What’s the difference between

ITCH SENSATION
- Scratch reflex
- Sensation of the skin
- Scratching can cause pain
- Two itch types: histamine-dependent and not
- Pain-control drugs cause itching that cannot be controlled with an antihistamine

PAIN SENSATION
- Withdrawal reflex
- Sensed within the body and in the skin
- Pain suppresses itchiness
- Pain-control drugs can have an unfortunate side effect: itching

Developing a new view
The complexity of these sensory functions is revealed in the research of Zhou-Feng Chen, PhD, and colleagues. They have identified neurons that express receptors of regulatory molecules called GRPRs. In a mouse model, inhibiting or destroying these neurons appears to limit scratching, without dampening the withdrawal response to pain. Chen calls it “a very striking and unexpected result, because it suggests there is an itch-specific neuronal pathway in the spinal cord.” Controlling this mechanism in humans could mean better pain control without the common side-effect of itching.

The legendary satyr Marsyas suffered a painful fate for having challenged the god Apollo. Although Marsyas is bound to his doom, the universal reaction to pain is to withdraw. This aversion can affect attitudes toward pain research, too. Unlike itching and scratching, which sometimes amuse people, there is often a visceral distaste for pain studies that are intended to help alleviate suffering.