Function	Nerve Fiber Features	Structure / Histology	Location	Receptor
Pain and temperature receptors	Unmyelinated sensory nerve fibers penetrate the basement membrane and end freely between epithelial cells	Simplest receptors, widely distributed	Epidermis of skin, cornea, conjunctiva, oral cavity	**Free nerve endings**
Mechanoreceptors for light touch	Free nerve endings around hair root	Web of free nerve endings forming basket-like structure around hair follicle	Around base of hair follicles (thin skin)	**Hair root plexus**
Detect touch and pressure; tactile discrimination	Sensory fiber loses myelin, penetrates basement membrane and terminates as a disc around Merkel cells	Associated with Merkel cells (modified epithelial cells)	Basal layer of epidermis of palms, soles, fingers	**Merkel tactile disc**
Taste, smell, hearing, equilibrium, vision	Sensory nerve endings associated with specialized epithelial cells	Specialized neuroepithelial receptor cells	Taste buds (tongue), olfactory epithelium (nose), organ of Corti (ear), macula utriculi, macula sacculi, crista ampullaris, retina	**Neuroepithelium endings**
Detect light touch (mechanoreceptors)	Sensory nerve enters myelinated then loses myelin and spirals between cells	Oval encapsulated corpuscles formed of transversely arranged modified Schwann cells; collagen fibers anchor corpuscle to dermo-epidermal junction	Dermal papillae of hairless skin (tips of fingers)	**Meissner corpuscles**
Detect skin stretch and sustained pressure	Unmyelinated sensory nerve penetrates side of corpuscle and branches	Fusiform encapsulated corpuscle with fluid and collagen fibers parallel to skin surface	Dermis of skin especially in sole	**Ruffini corpuscles**
Detect cold and touch (thermo/ mechanoreceptors)	Unmyelinated sensory fibers enter and branch, ending with coiled bulb ends	Rounded encapsulated structures	Dermis of genital areas and mucous membranes	**Krause end bulbs**
Detect deep touch, pressure, high frequency vibration; proprioceptor	Sensory nerve loses myelin, enters one pole and runs along longitudinal axis ending in small expansions	Large oval encapsulated corpuscles with 20–50 concentric lamellae of Schwann-like cells separated by gel-like material (onion-like appearance)	Deep dermis	**Pacinian corpuscles**
Detect tension in tendons during muscle contraction (proprioceptor)	Sensory nerve penetrates capsule and ends around collagen bundles	Encapsulated receptor in tendon with collagen bundles	Tendons near insertion of muscle fibers	**Golgi tendon organ (tendon spindle)**
Regulation of muscle tone, movement, and posture	Sensory fibers wrap around intrafusal fibers; motor gamma fibers supply contractile ends	Fusiform structure with CT capsule containing fluid and intrafusal fibers (2–12 fibers)	Within skeletal muscles, parallel to muscle fibers	**Muscle spindle**
Stretch detection and proprioception	Nuclear bag → primary sensory fiber (annulospiral). Nuclear chain → 1 primary (annulospiral) + 2 secondary (flower spray). Motor supply by gamma fibers	Nuclear bag fibers: few, thicker, longer with central nuclear area. Nuclear chain fibers: numerous, thinner, nuclei arranged in chain	Inside muscle spindle	**Intrafusal fibers (types)**