

ASCENDING TRACTS

	Tract	Function	Receptors and afferents	1 <sup>st</sup> order neuron	2 <sup>nd</sup> order neuron	Decussation level	3 <sup>rd</sup> order neuron	Final destination
DC-ML SYS	Dorsal column system	Fine touch, pressure, vibration, movement, position,	Highly specialized mechanoreceptors  Highly myelinated SA fibers	Dorsal root ganglia	Fasciculus gracilis (T6 or lower) Fasiculus cuneatus (above T6)	Cross midline at medulla → medial leminiscus	VPL (thalamus)	Somatosensory cortex
ANTEROLATERAL SYSTEM	Neospinalthalamic tract	Pain, temperature	Nerve endings in skin	DRG (via Lissauer's) *signal edited in lamina II	Lamina I and V (nuc posteromarginalis, nuc proprius)	Cross at each spinal segment → ascend in anterolateral fasciculus	VPL	Somatosensory cortex
	Paleospinothalamic tract	Dull, poorly localized pain	Nerve endings in skin	DRG *signal edited in lamina II	Lamina IV-VIII	Cross at each spinal segment → ascend in anterolateral fasciculus	Intralaminar nucleus (thalamus)	Cingulate cortex
	Anterior Spinothalamic tract	Crude touch and pressure, poorly localized, non-discriminative	Nerve endings in skin	DRG	Dorsal horn	ascend bilaterally in anterolateral fasciculus	VPL	Somatosensory cortex
SPINOCEREBELLAR TRACTS	Dorsal Spinocerebellar tract (DSCT-C8 and below)	Muscle sense	Muscle spindles Golgi tendon organs	DRG	Clarke's nucleus (C8 and below) External cuneatus (above C8)	DSCT <u>Do not cross</u>	--	Cerebellum (via ICP)
	Cuneocerebellar tract (above C8)							
	Ventral Spinocerebellar tract (VSCT)	Whole limb muscle sense, mostly lower limbs	Golgi tendon organs	DRG	Spinal border cells	<u>Cross → VSCT</u> → <u>cross again</u> (end up on same side)	--	Cerebellum (via SCP)

DESCENDING TRACTS

	Tract	Function	Origin	Pathway/Decussation	Destination
CORTICOSPINAL	Lateral corticospinal tract (LCST)	Voluntary movement	<b>Motor and premotor cortex</b>	<b>Internal capsule → cerebral peduncle → pyramids</b> Cross midline in pyramids → descend in LCST	Some <b>interneurons</b> in intermed gray  <b>alpha motor neurons</b> in distal muscles
	Anterior corticospinal tract (ACST)	Voluntary movement  *Only upper cervical and upper thoracic levels	<b>Motor and premotor cortex</b>	<b>Internal capsule → cerebral peduncle → pyramids</b>  Stay ipsilateral, descend in ACST, cross midline at each level	<b>Axial motor neurons</b>
SCS - LAT GROUP	Rubrospinal	Motor control, coordination; muscle tone – distal flexors	<b>Red nucleus</b>	Cross midline at <b>Ventral Tegmental Decussation (VTD)</b> → rubrospinal tract *always with LCST	<b>Interneurons</b> of ventral horn
	Raphespinal	Modulating pain (releases serotonin)	<b>Dorsal raphe nucleus</b>	Cross midline, descend next to RuST, LCST	Interneurons and SA in laminae I, II, V
SUBCORTICOSPINAL – MEDIAL GROUP	Tectospinal	Motor: mediates head, eye, postural responses to visual stimuli	<b>Superior colliculus</b>	Cross midline at Dorsal Tegmental Decussation (DTD) Projects bilaterally onto grey matter	Interneurons (anterior horn) and motor neurons (neck, trunk muscles) at cervical levels
	Reticulospinal	Modulates spinal reflexes Axial muscle tone, posture	<b>Reticular formation</b>	Pontine reticulospinal tract: uncrossed Medullary RTS: bilaterally → medial/lateral funiculus	Interneurons at all levels
	Lateral vestibulospinal (LVST)	Antigravity extensor muscles in lower limbs → posture and balance	<b>Lateral vestibular nucleus</b>	Don't cross midline → LVST	<b>Motor and interneurons of extensors</b>
	Medial vestibulospinal (MVST)	Flexors → control head position according to vestibular information (in cervical levels of SC)	<b>Medial vestibular nucleus</b>	Don't cross midline → MVST	<b>Interneurons and motor neurons of neck</b>