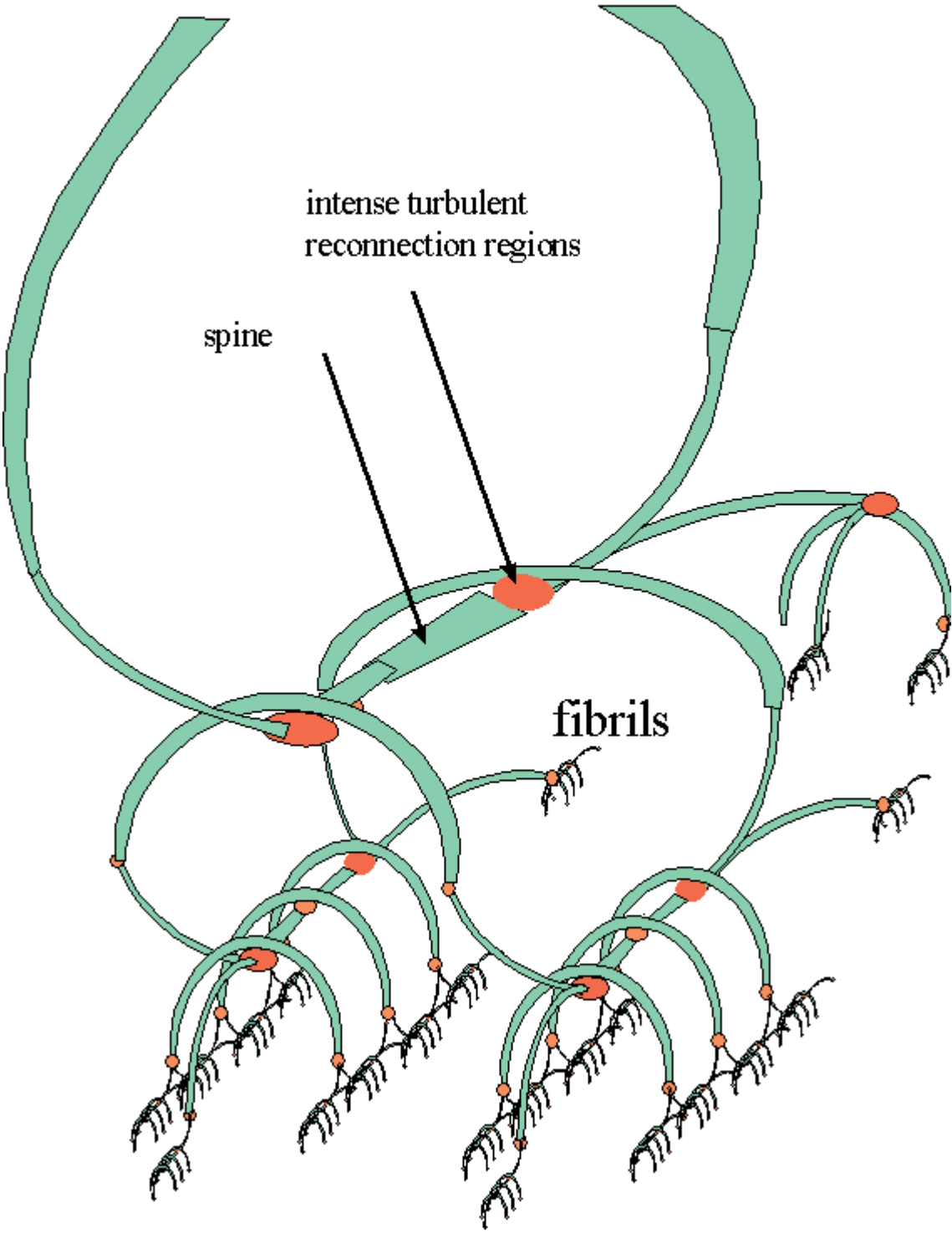Loop Hierarchy