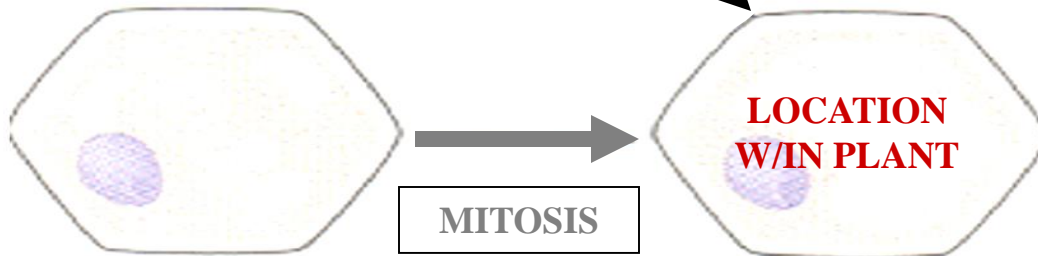


**STEM APICAL  
MERISTEM**

**DERIVATIVE CELL**

**PARENCHYMA CELL**



**PARENCHYMA CELL  
CAN POTENTIALLY  
DIFFERENTIATE  
INTO ANY PLANT CELL TYPE**

**MERISTEM CELL INITIAL**

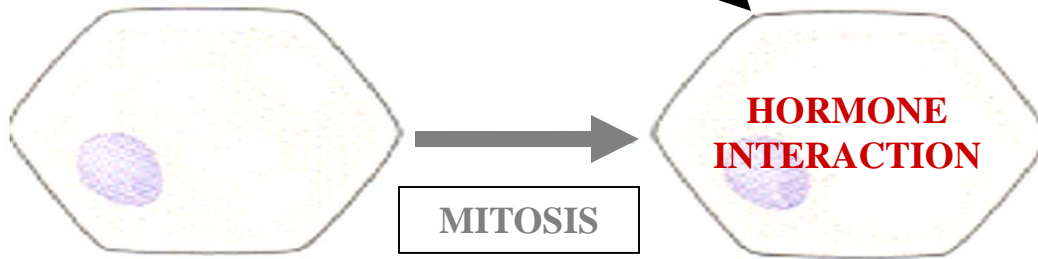
**PARENCHYMA CELL**

**PARENCHYMA  
BASIC  
PLANT CELL**

**STEM APICAL  
MERISTEM**

**DERIVATIVE CELL**

**PARENCHYMA CELL**



**MITOSIS**

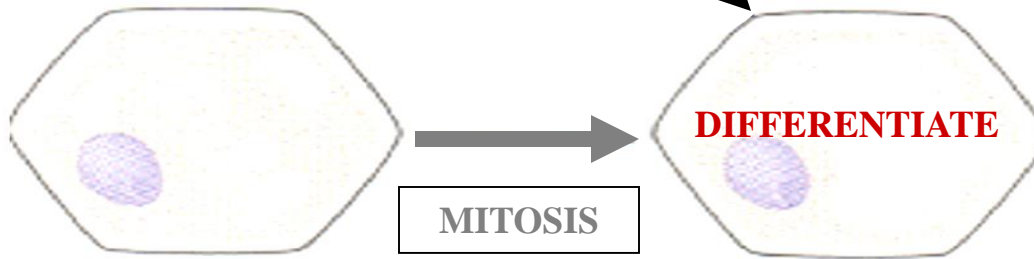
**HORMONE  
INTERACTION**

**MERISTEM CELL INITIAL**

**PARENCHYMA CELL**

**PARENCHYMA  
BASIC  
PLANT CELL**

**PARENCHYMA CELL  
CAN POTENTIALLY  
DIFFERENTIATE  
INTO ANY PLANT CELL TYPE**

**STEM APICAL  
MERISTEM****DERIVATIVE CELL****PARENCHYMA CELL****MERISTEM CELL INITIAL****PARENCHYMA CELL****PARENCHYMA  
BASIC  
PLANT CELL**

**PARENCHYMA CELL  
CAN POTENTIALLY  
DIFFERENTIATE  
INTO ANY PLANT CELL TYPE**

**STEM APICAL  
MERISTEM**

**COLLENCHYMA CELL**

**DERIVATIVE CELL**

**PARENCHYMA CELL**

**DIFFERENTIATE**

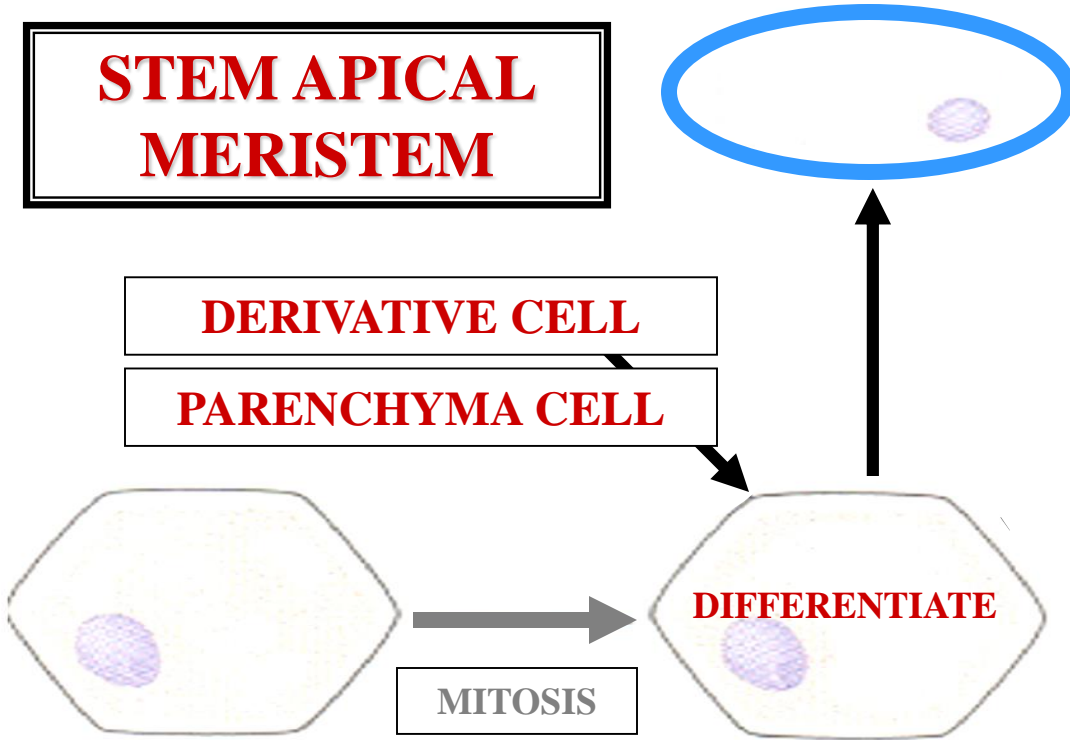
**MITOSIS**

**MERISTEM CELL INITIAL**

**PARENCHYMA CELL**

**PARENCHYMA  
BASIC  
PLANT CELL**

**PARENCHYMA CELL  
CAN POTENTIALLY  
DIFFERENTIATE  
INTO ANY PLANT CELL TYPE**

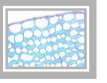






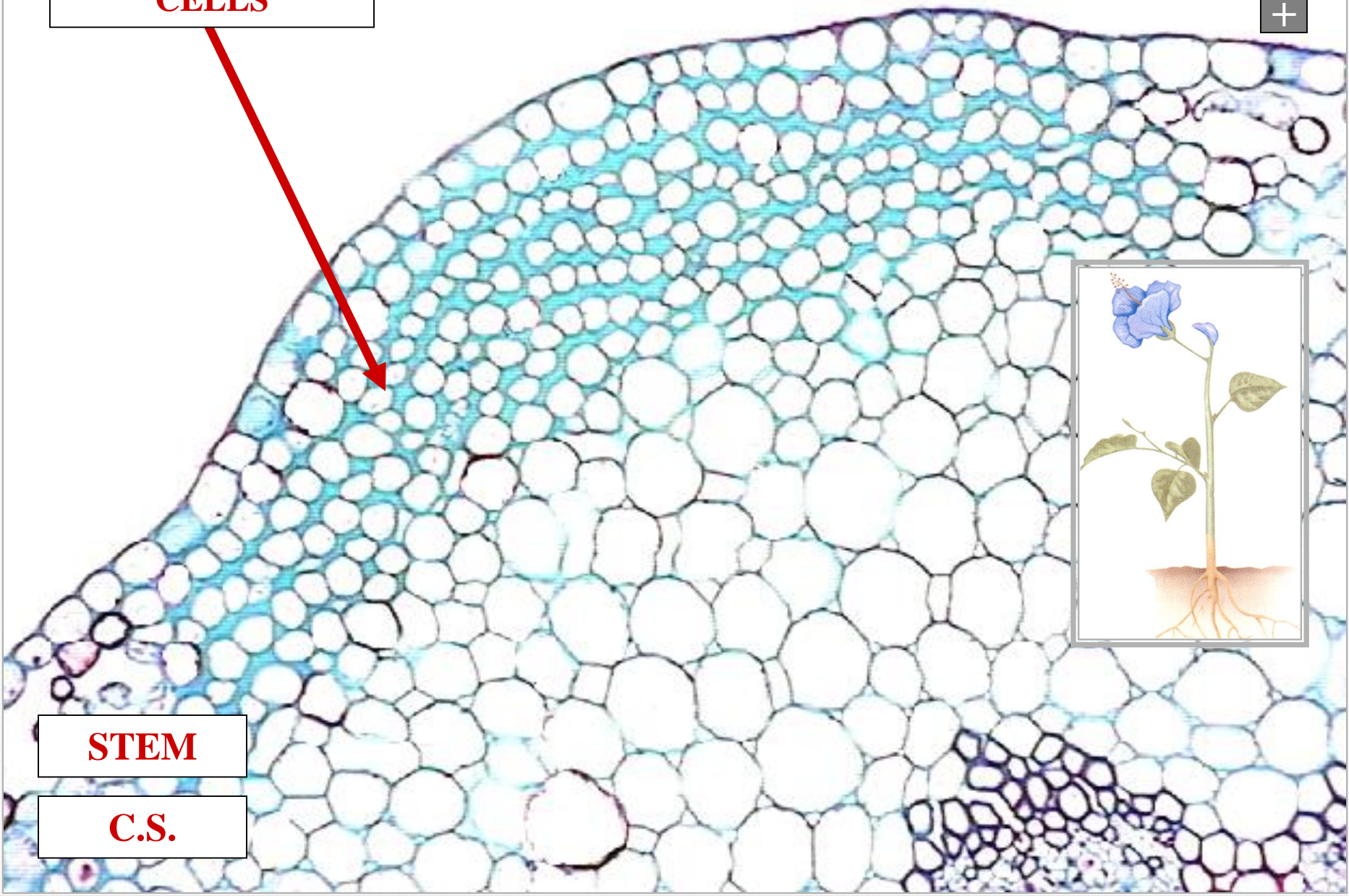
# COLLENCHYMA CELL CHARACTERS

**COLLENCHYMA  
CELLS**

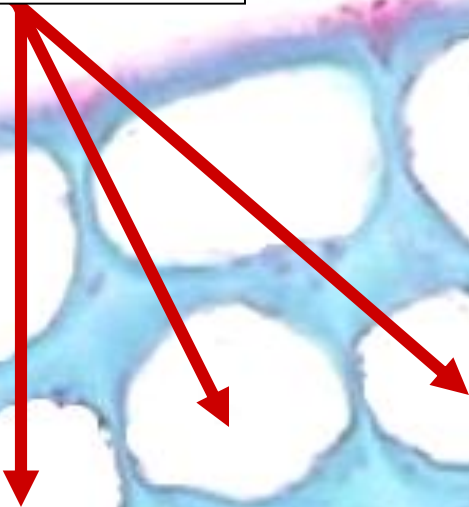


**STEM**

**C.S.**

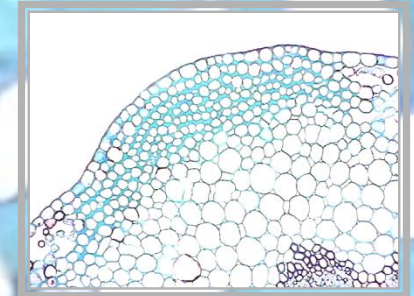
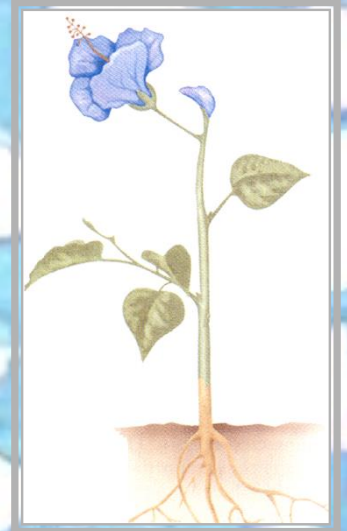


**COLLENCHYMA  
CELLS**



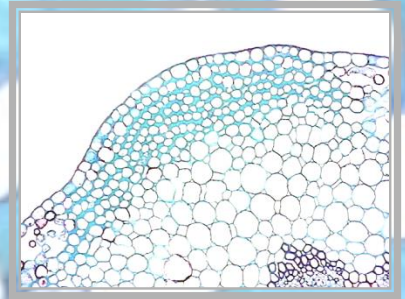
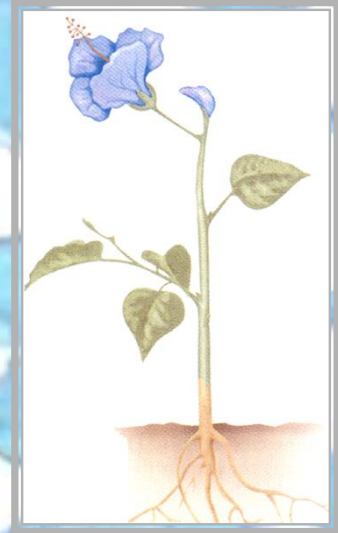
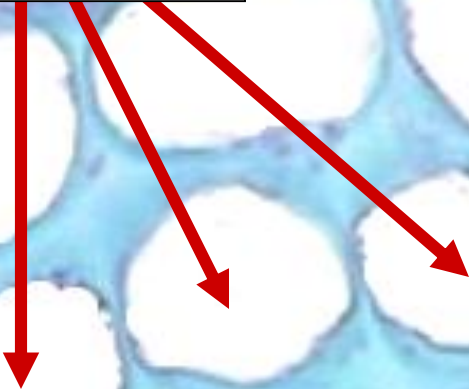
**STEM**

**C.S.**



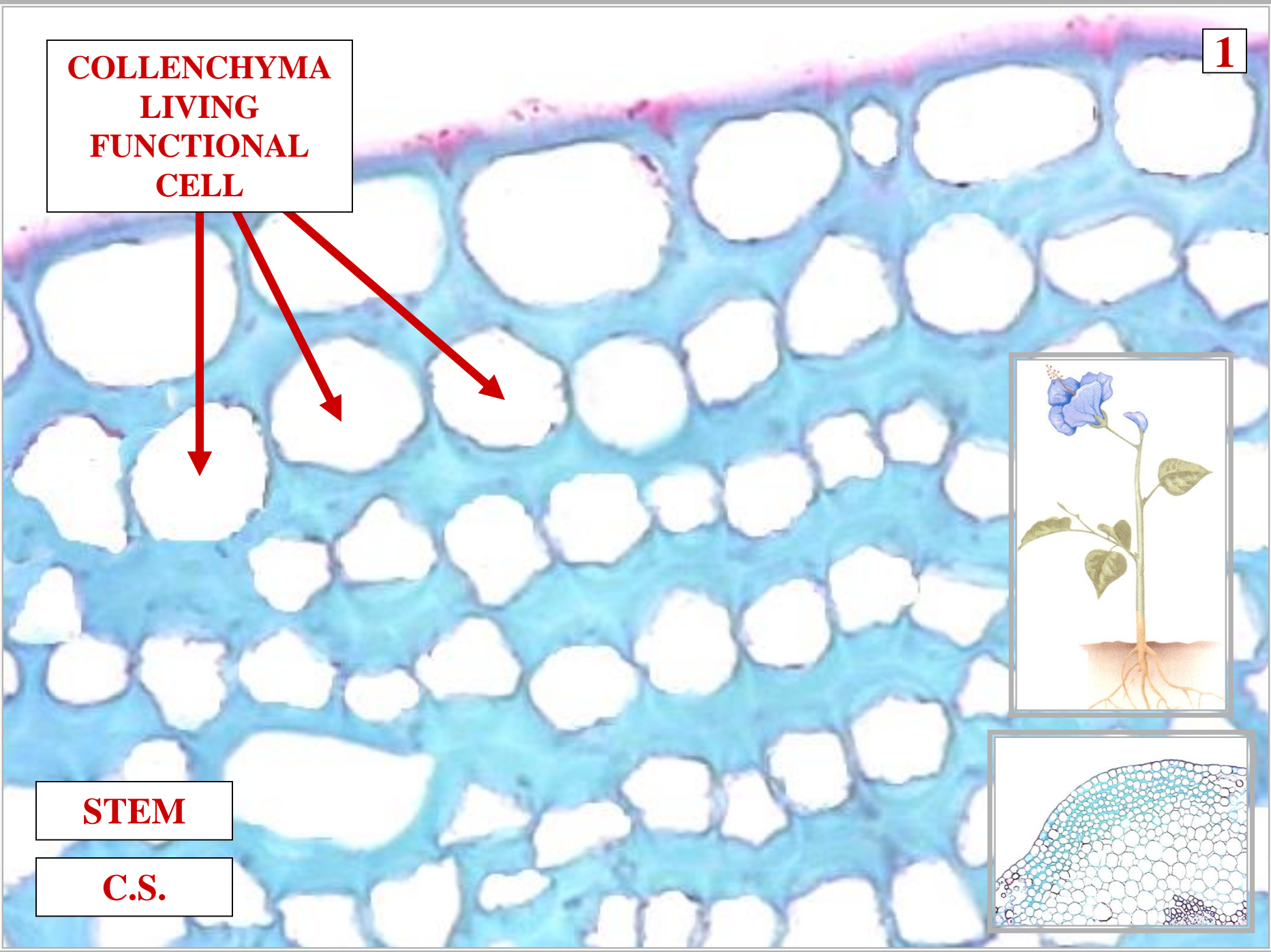


**COLLENCHYMA  
LIVING  
FUNCTIONAL  
CELL**

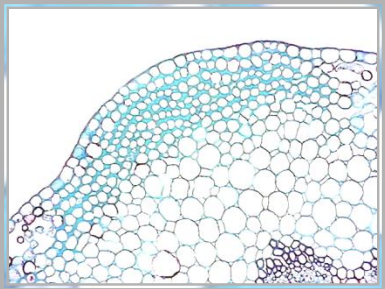
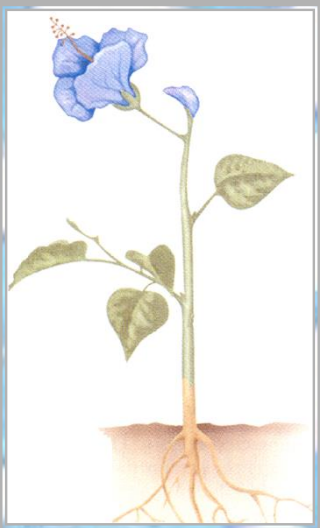
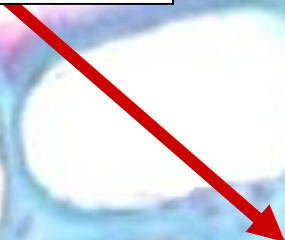


**STEM**

**C.S.**

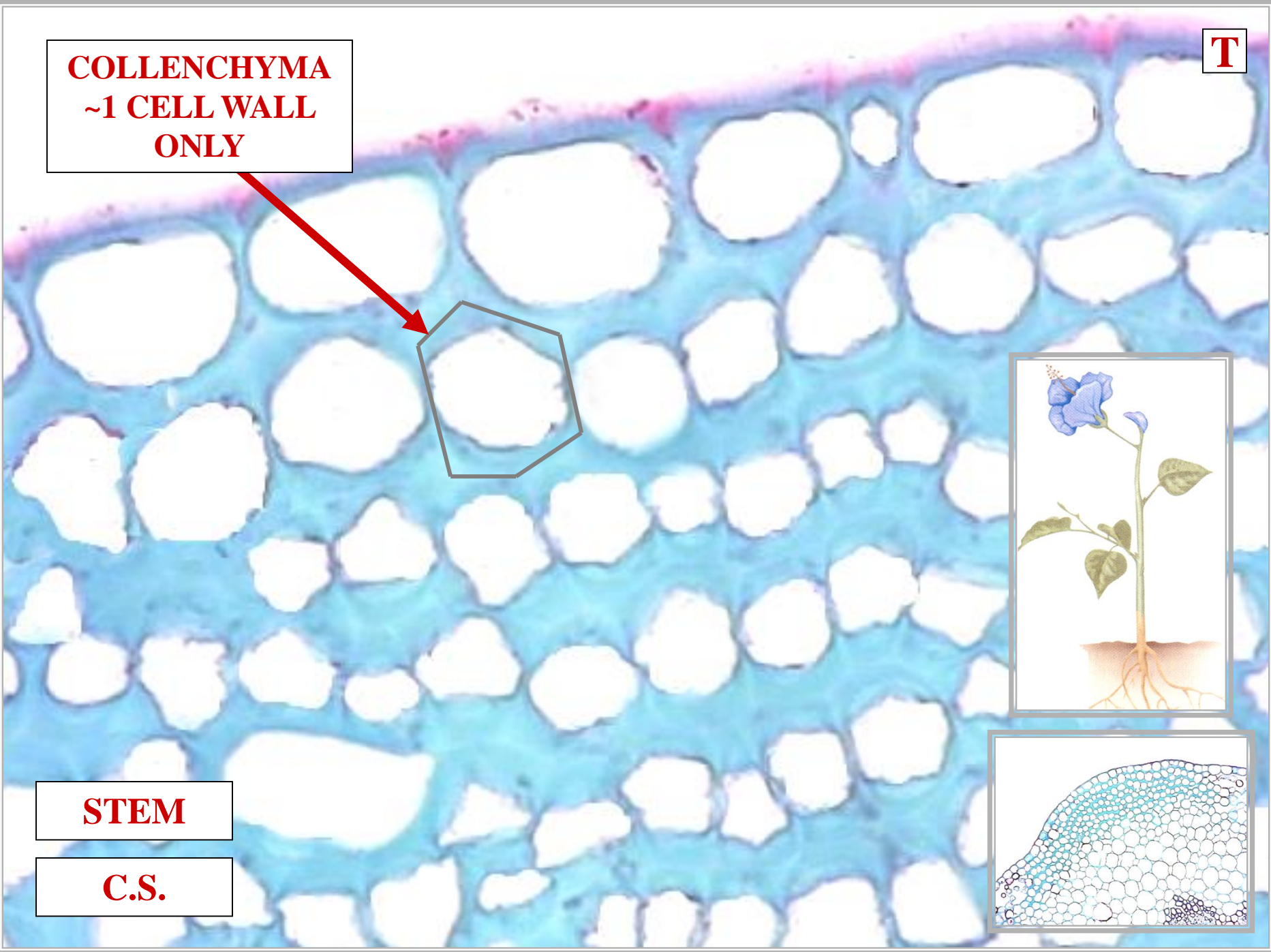


**COLLENCHYMA**  
**~1 CELL WALL**  
**ONLY**



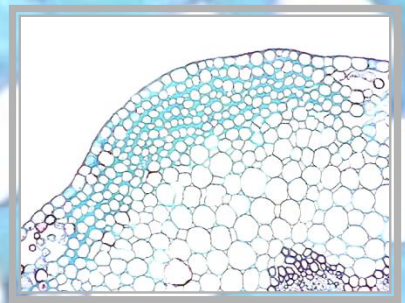
**STEM**

**C.S.**



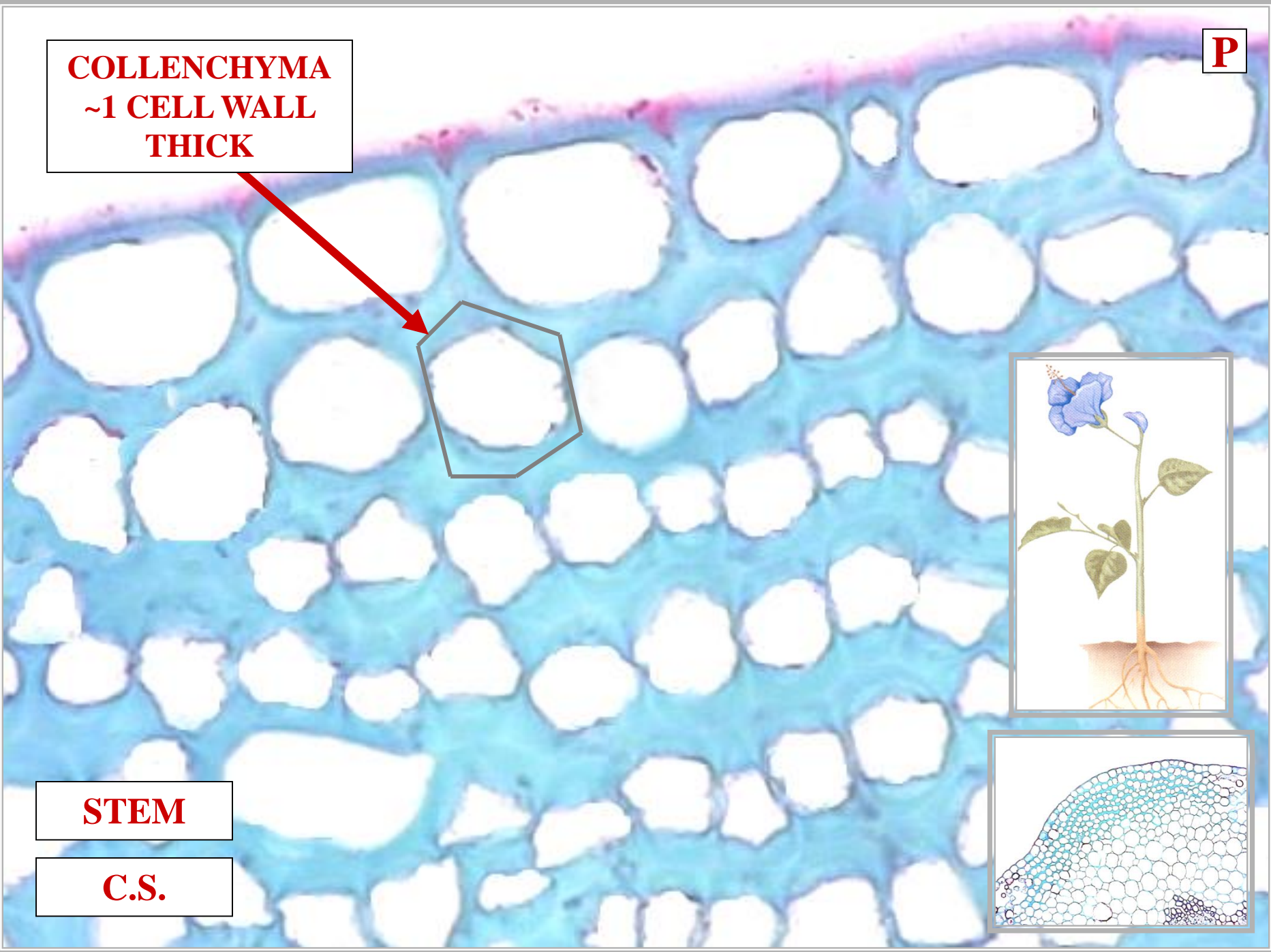


**COLLENCHYMA  
~1 CELL WALL  
THICK**



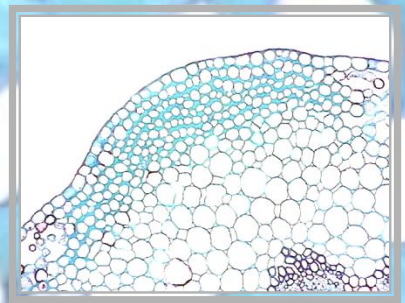
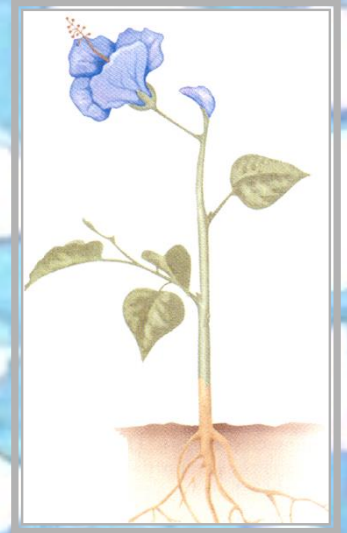
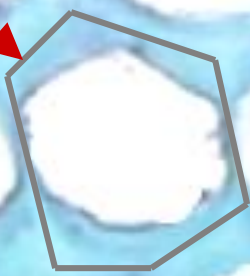
**STEM**

**C.S.**



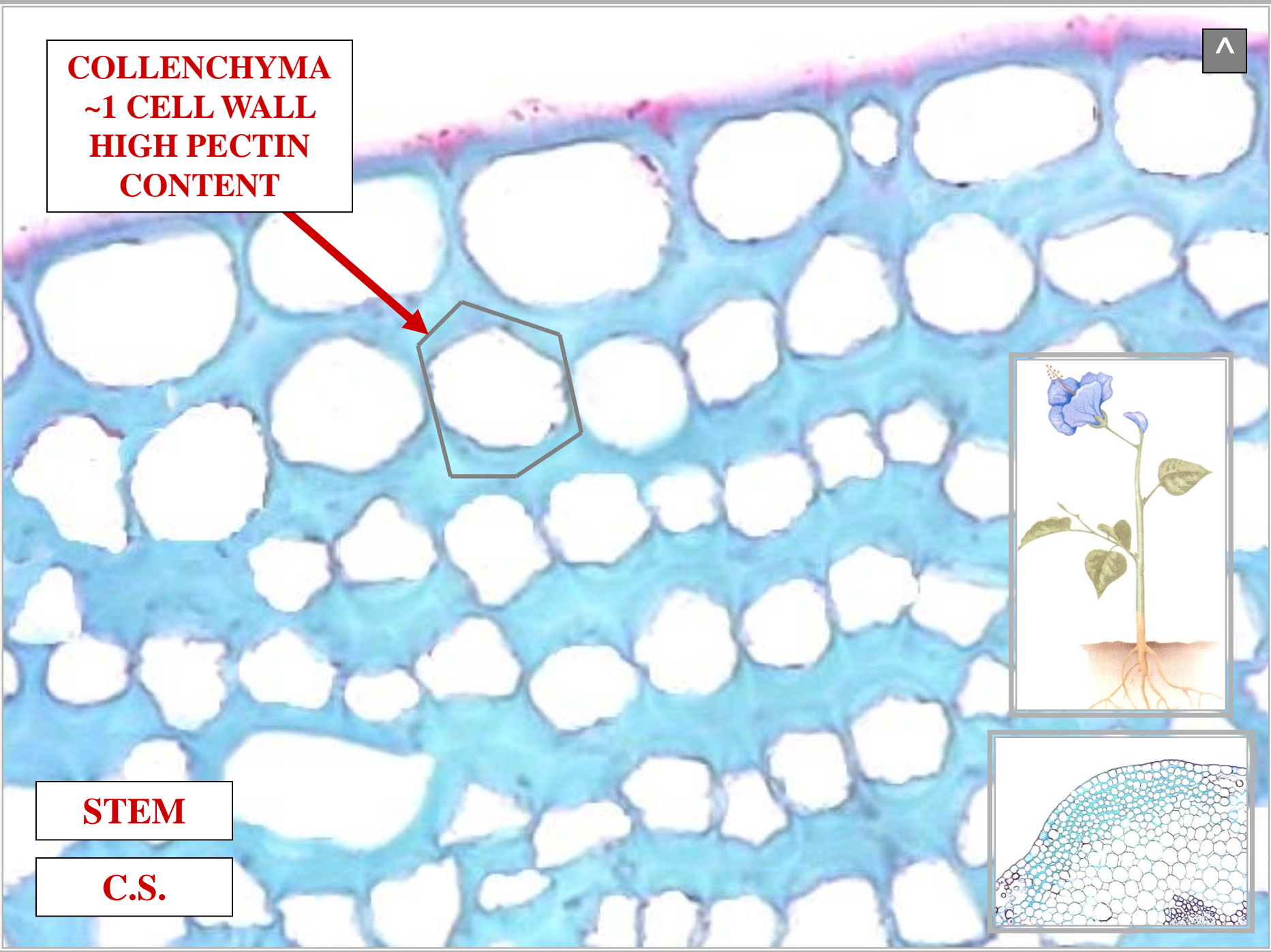


**COLLENCHYMA**  
**~1 CELL WALL**  
**HIGH PECTIN**  
**CONTENT**



**STEM**

**C.S.**





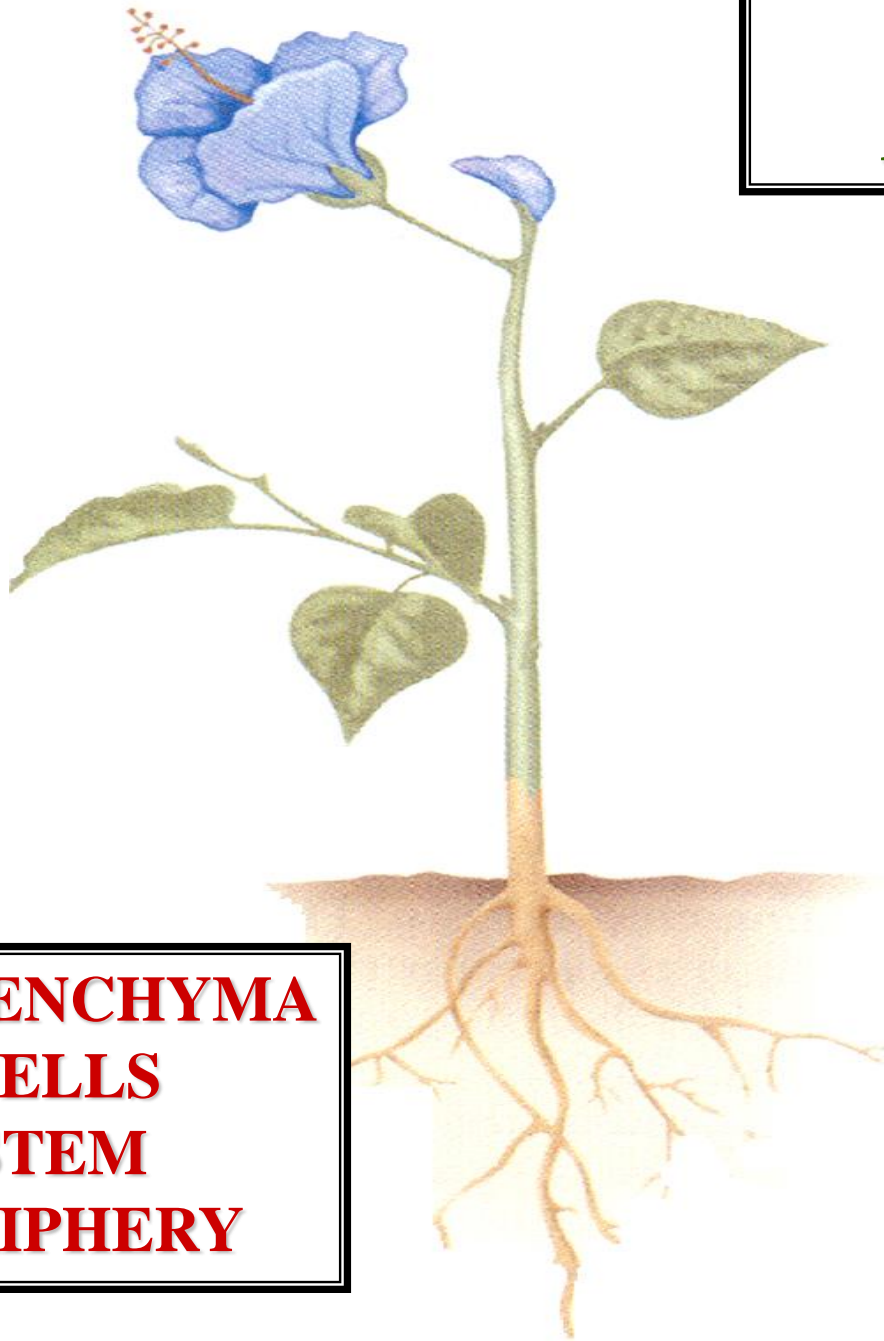
# COLLENCHYMA CELL DISTRIBUTION



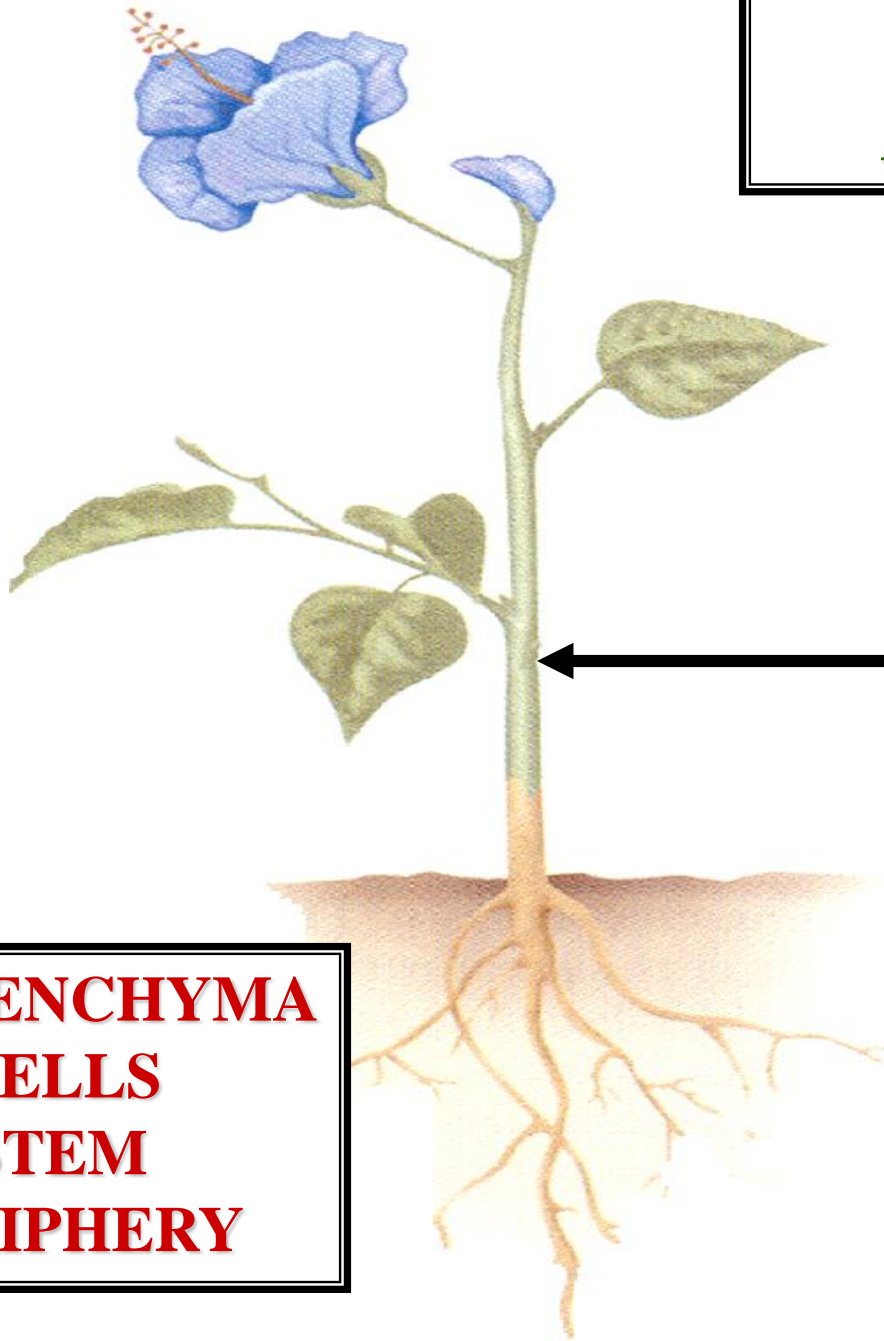
# TYPICAL ANGIOSPERM

S

**COLLENCHYMA  
CELLS  
STEM  
PERIPHERY**



# TYPICAL ANGIOSPERM



**STEM**

**COLLENCHYMA  
CELLS  
STEM  
PERIPHERY**



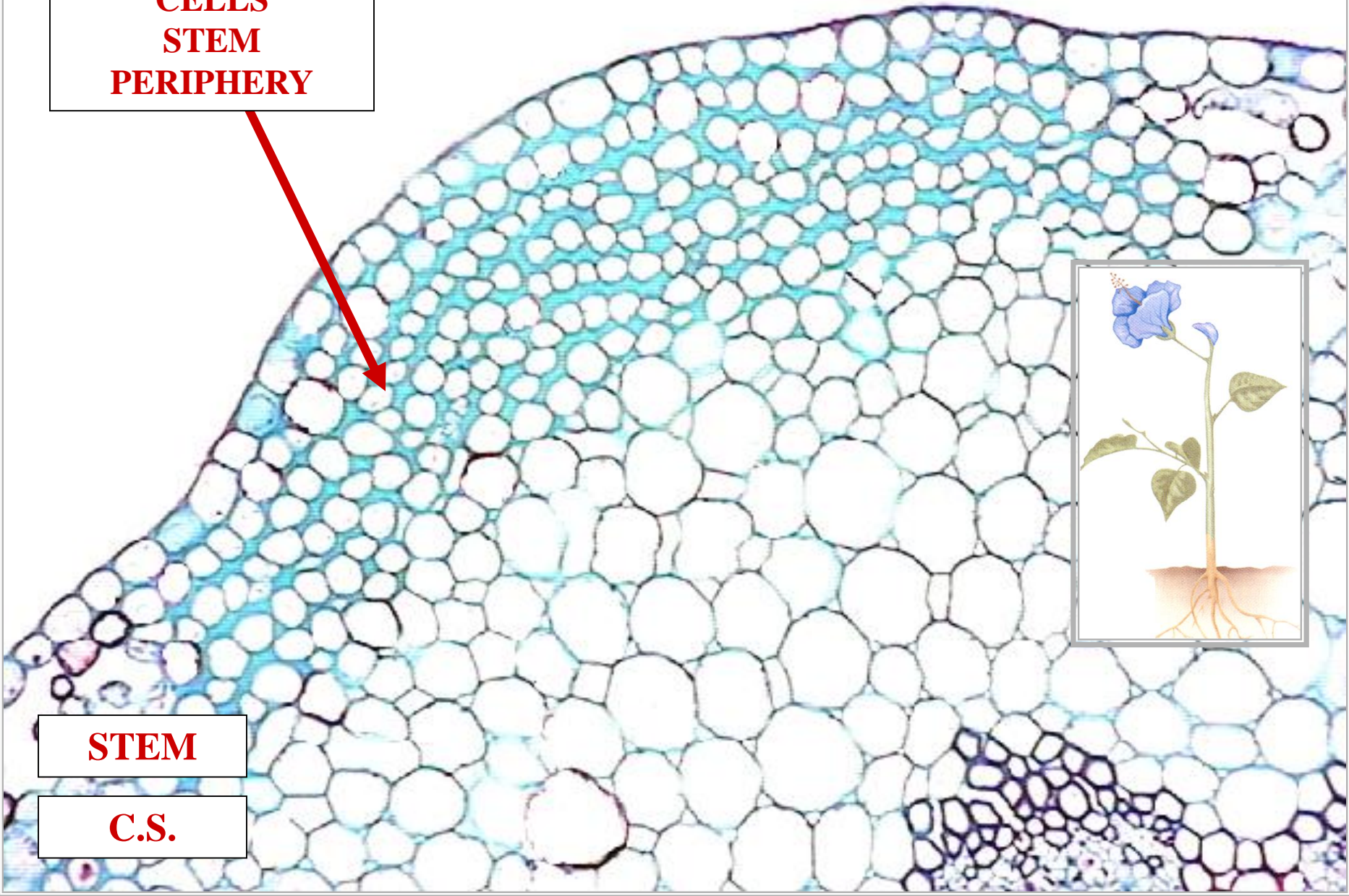


**COLLENCHYMA  
CELLS  
STEM  
PERIPHERY**



**STEM**

**C.S.**





# COLLENCHYMA CELL FUNCTION

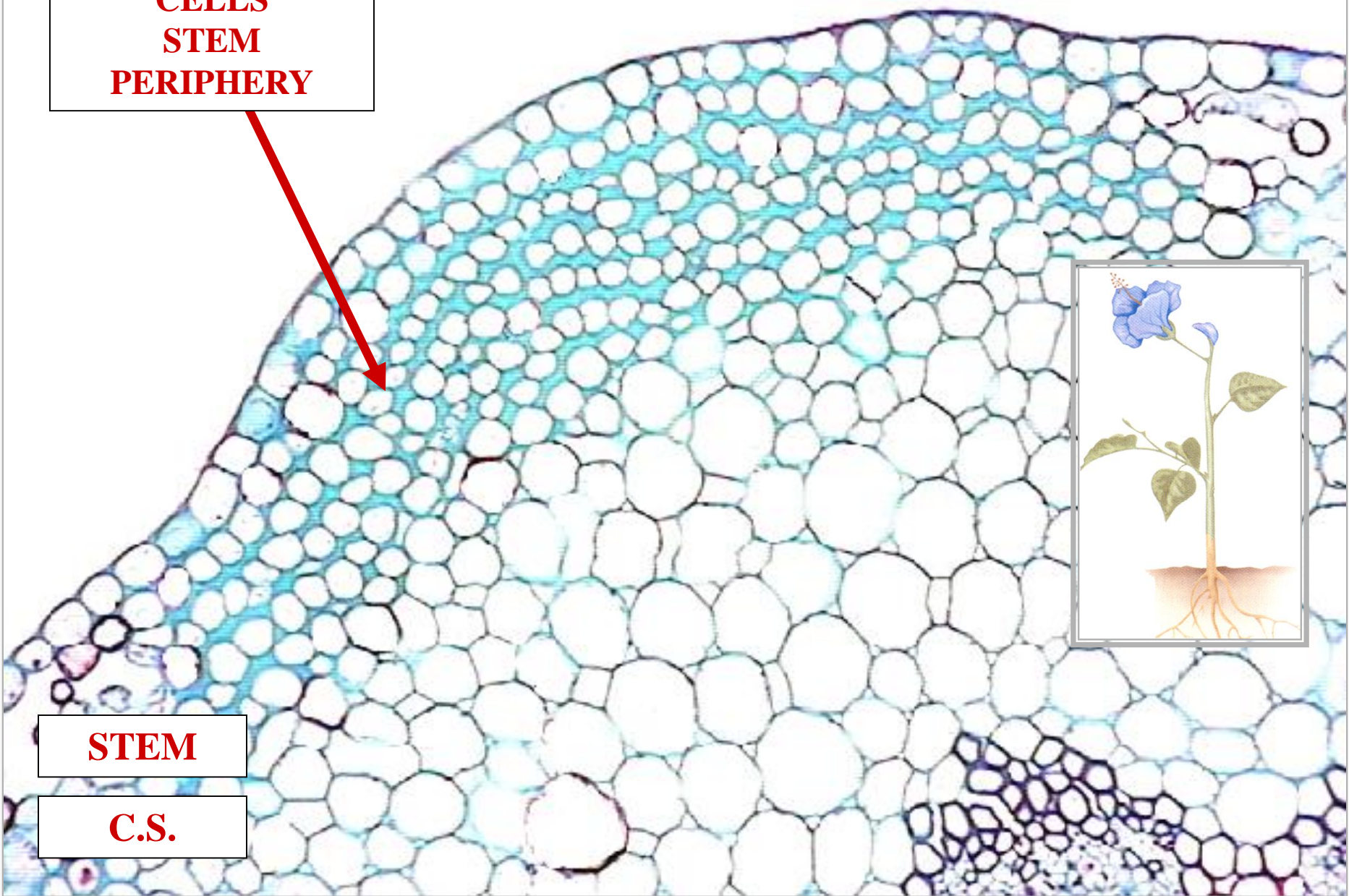


**COLLENCHYMA  
CELLS  
STEM  
PERIPHERY**



**STEM**

**C.S.**

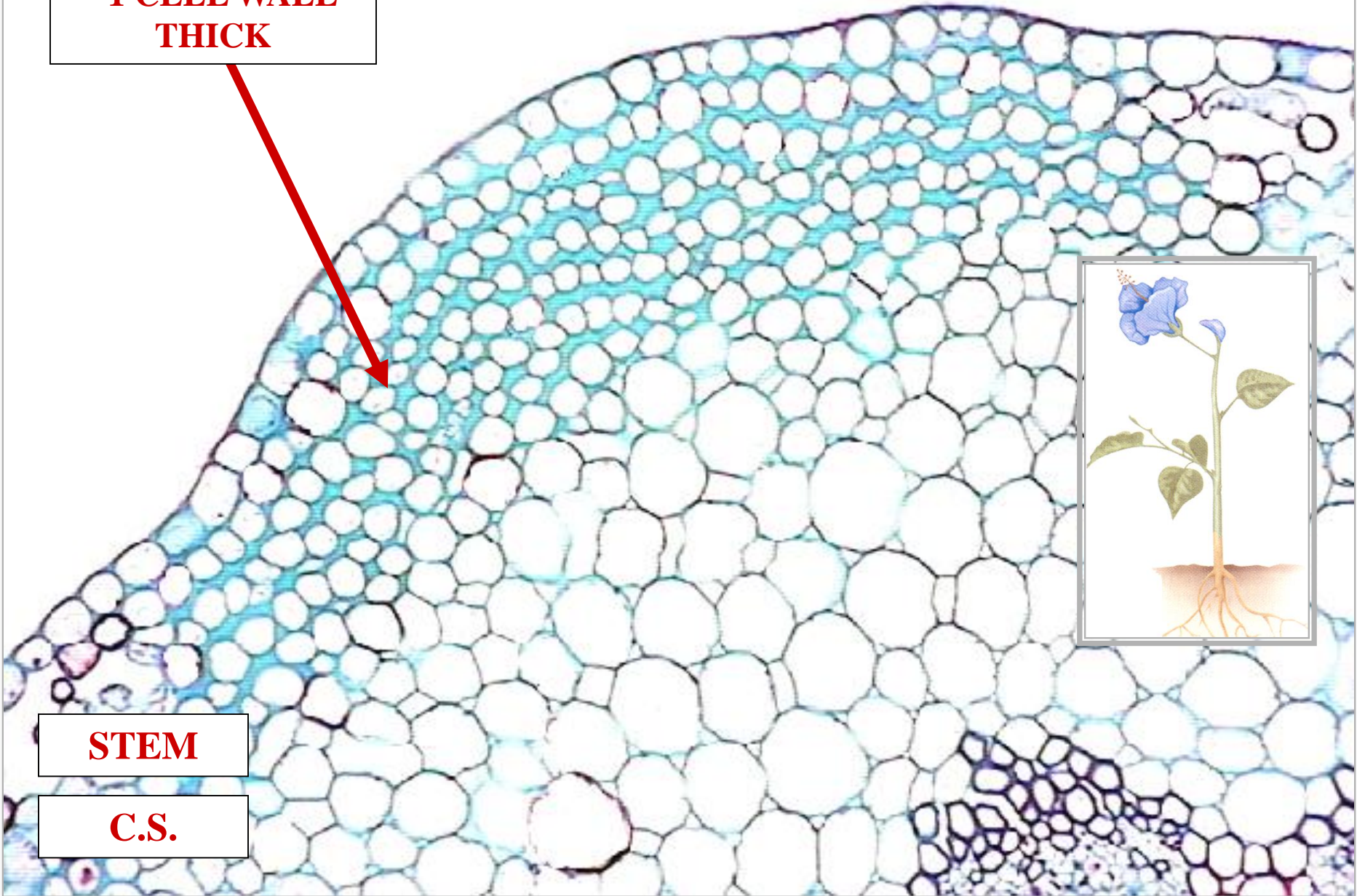


**COLLENCHYMA**  
**~1 CELL WALL**  
**THICK**



**STEM**

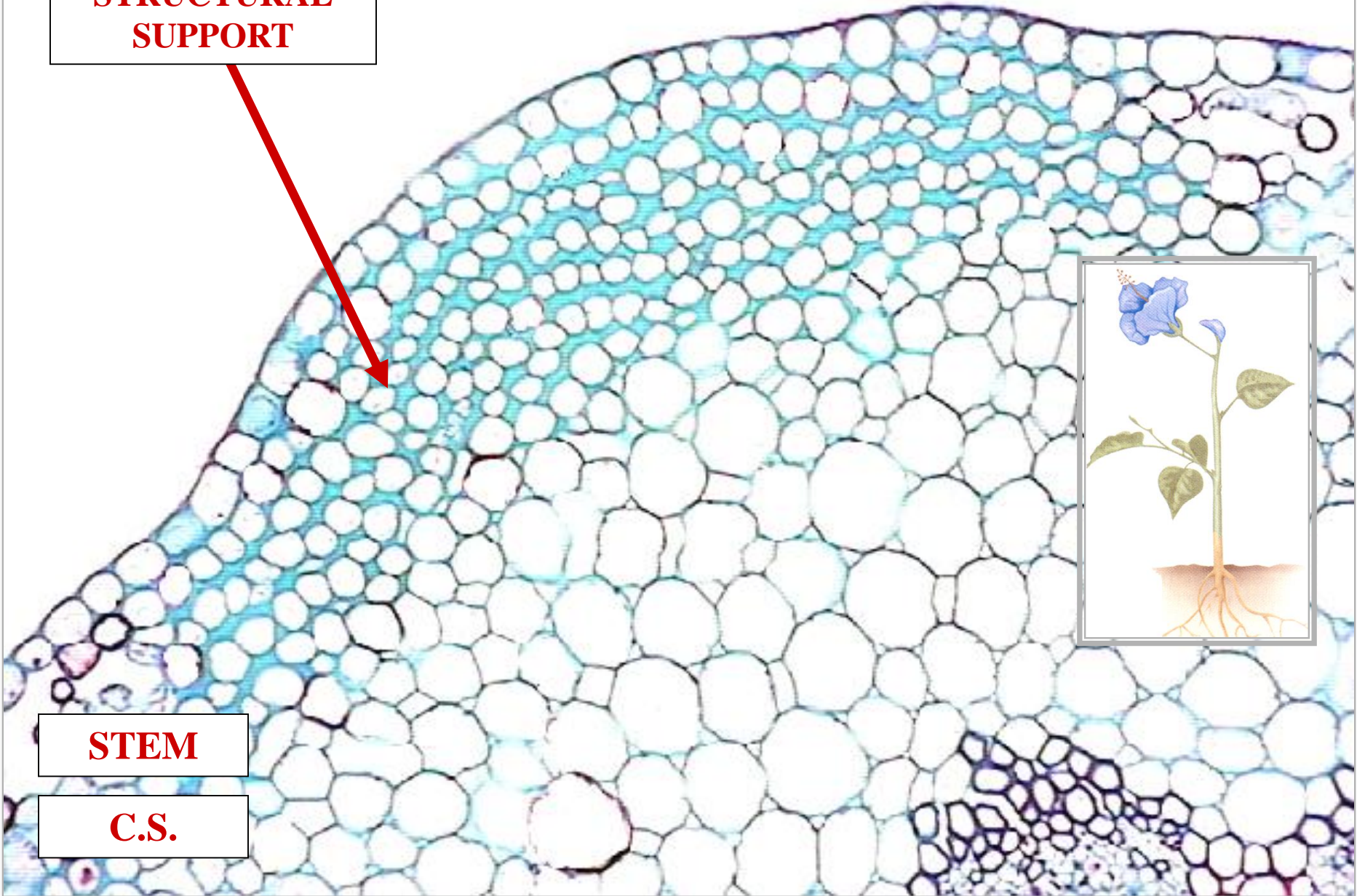
**C.S.**







**STEM  
STRUCTURAL  
SUPPORT**



**STEM**

**C.S.**

# COLLENCHYMA TISSUE



# **COLLENCHYMA TISSUE**

# COLLENCHYMA TISSUE



COLLENCHYMA CELL  
AGGREGATE

COLLENCHYMA  
TISSUE

# COLLENCHYMA TISSUE TYPES

# **COLLENCHYMA TISSUE TYPES**

**LAMELLAR COLLENCHYMA**

# **COLLENCHYMA TISSUE TYPES**

# **COLLENCHYMA TISSUE TYPES**

**LAMELLAR COLLENCHYMA  
ANGULAR COLLENCHYMA**

**COLLENCHYMA TISSUE  
TYPES**

# **COLLENCHYMA TISSUE TYPES**

L

**LAMELLAR COLLENCHYMA  
ANGULAR COLLENCHYMA  
LACUNAR COLLENCHYMA**

**COLLENCHYMA TISSUE  
TYPES**

**LAMELLAR  
COLLENCHYMA**

# LAMELLAR COLLENCHYMA



PLATED  
WALL THICKENINGS

# LAMELLAR COLLENCHYMA



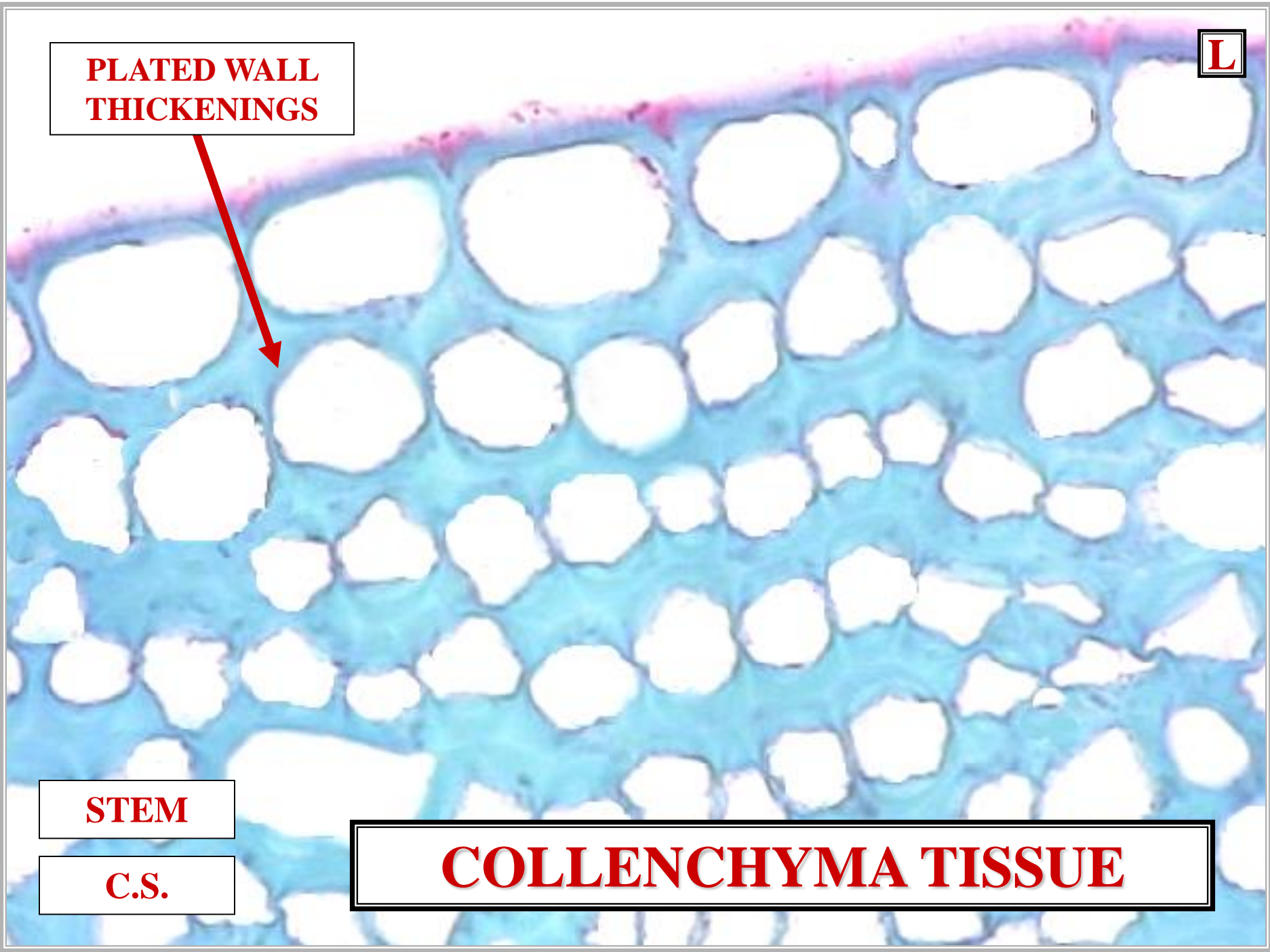
**PLATED WALL THICKENINGS**



**STEM**

**C.S.**

**COLLENCHYMA TISSUE**



**PLATED WALL THICKENINGS**

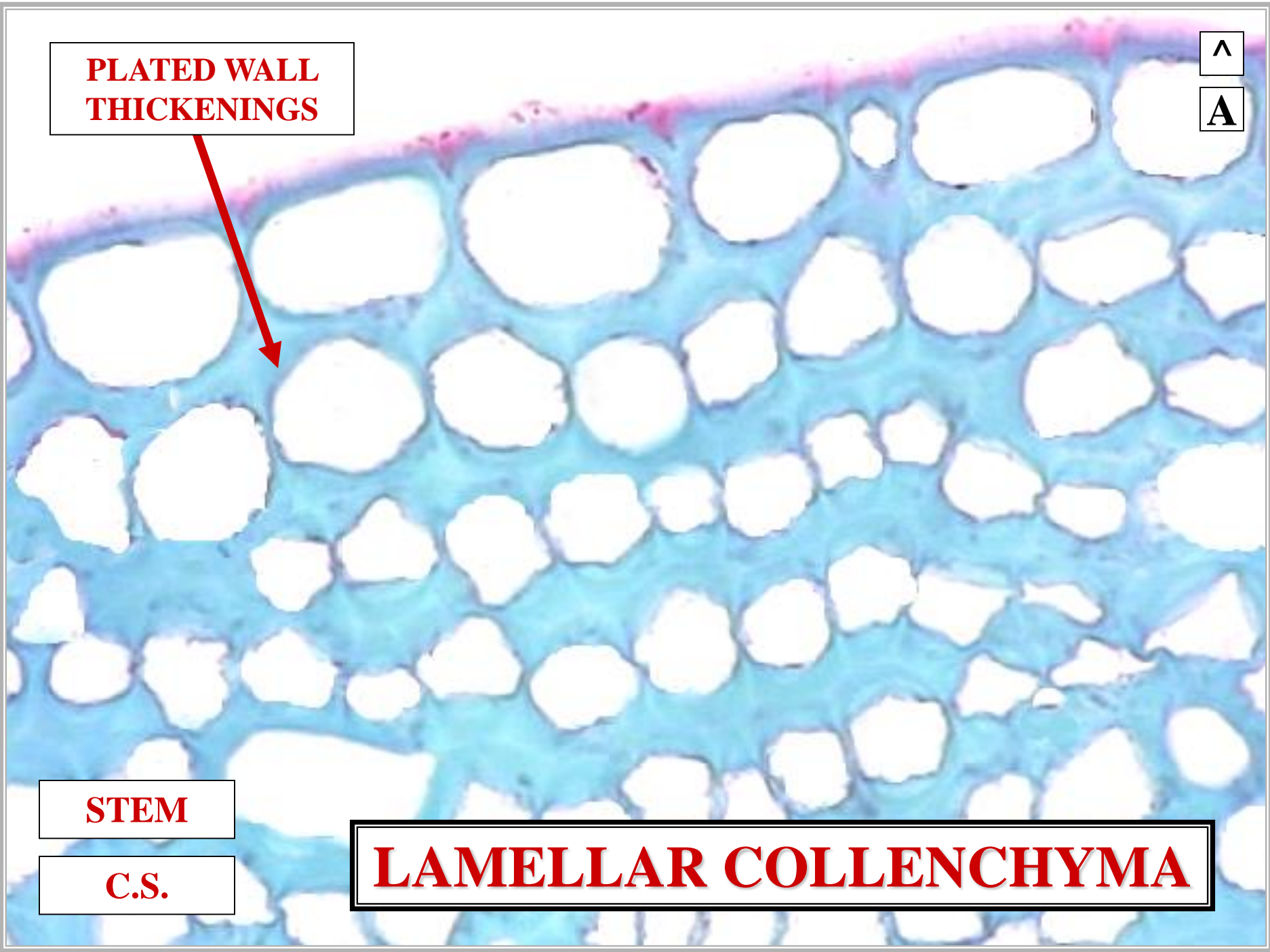


^  
A

**STEM**

**C.S.**

**LAMELLAR COLLENCHYMA**



**ANGULAR  
COLLENCHYMA**

# ANGULAR COLLENCHYMA

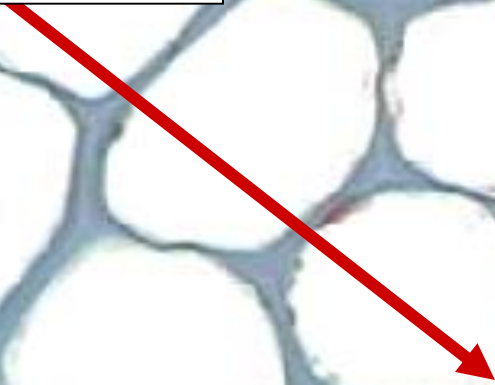


ANGULAR WALL  
THICKENINGS

# ANGULAR COLLENCHYMA

**A**

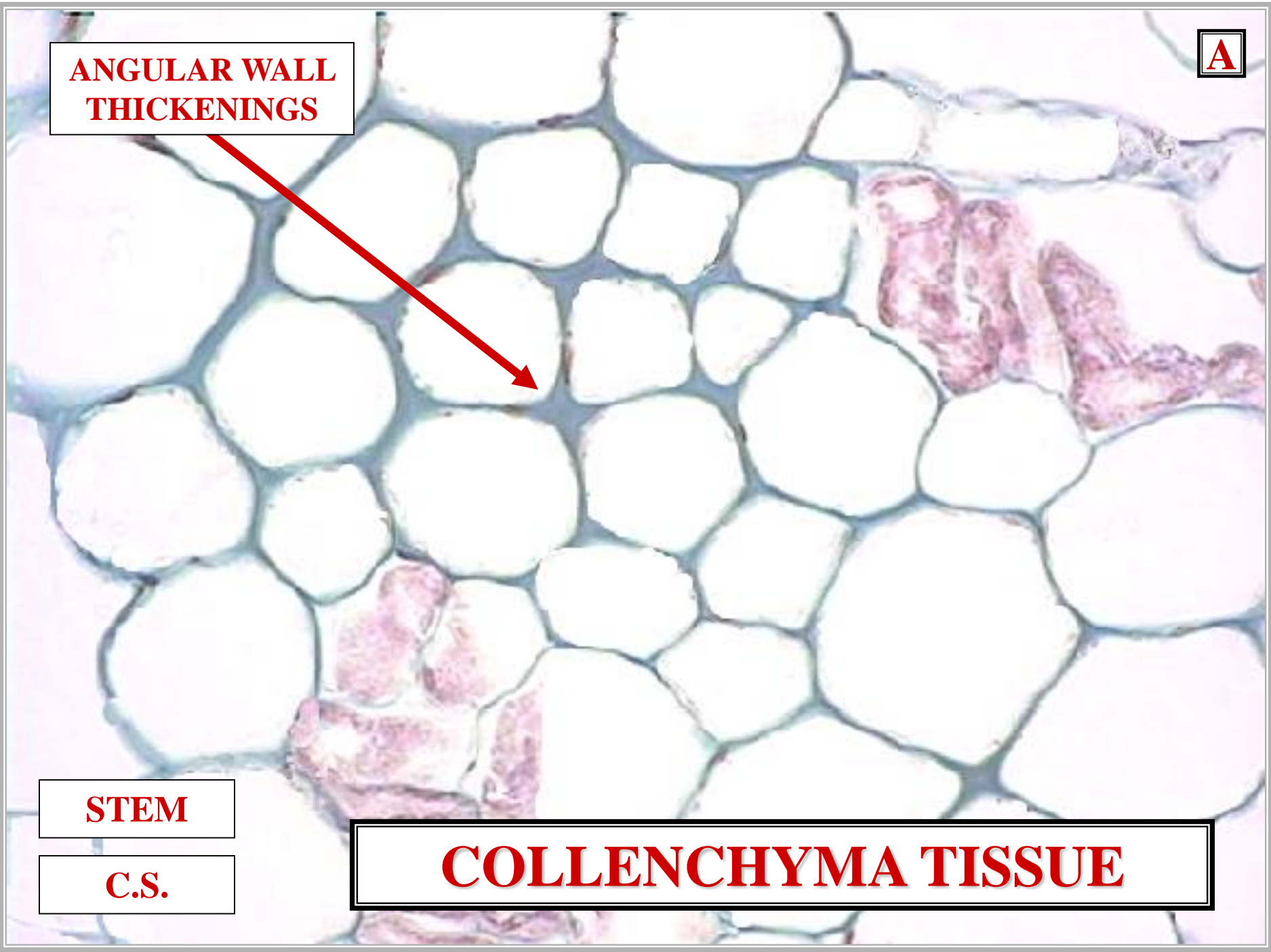
**ANGULAR WALL THICKENINGS**



**STEM**

**C.S.**

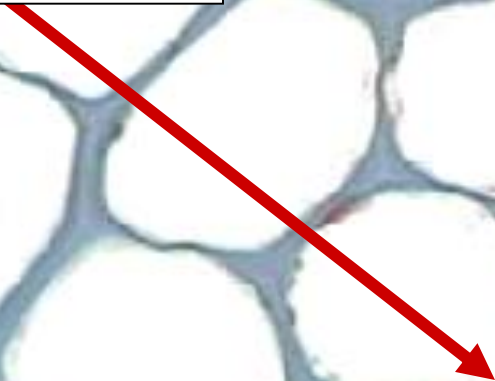
**COLLENCHYMA TISSUE**





**ANGULAR WALL THICKENINGS**

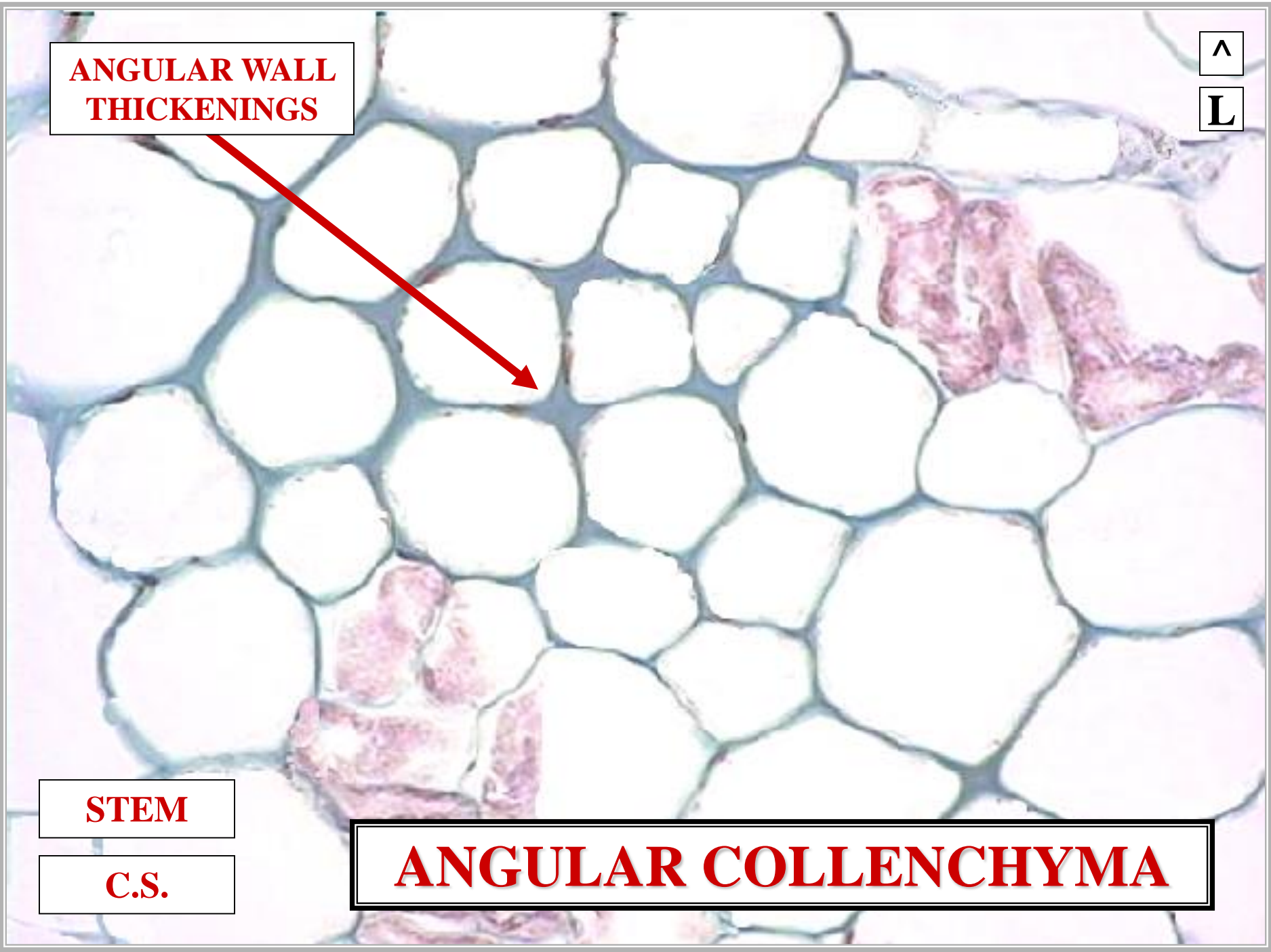
^  
L



**STEM**

**C.S.**

**ANGULAR COLLENCHYMA**



**LACUNAR**

**COLLENCHYMA**



**LACUNAR  
COLLENCHYMA**

**ANGULAR WALL  
THICKENINGS**

**LACUNAR  
COLLENCHYMA**



**LACUNAR  
COLLENCHYMA**  
ANGULAR WALL  
THICKENINGS

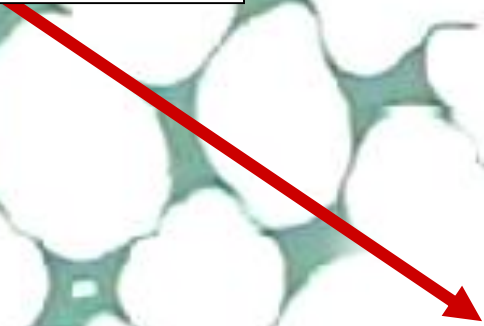
---

WITH LACUNA  
**LACUNAR  
COLLENCHYMA**



**L**

**ANGULAR WALL THICKENINGS**



**STEM**

**C.S.**

**COLLENCHYMA TISSUE**

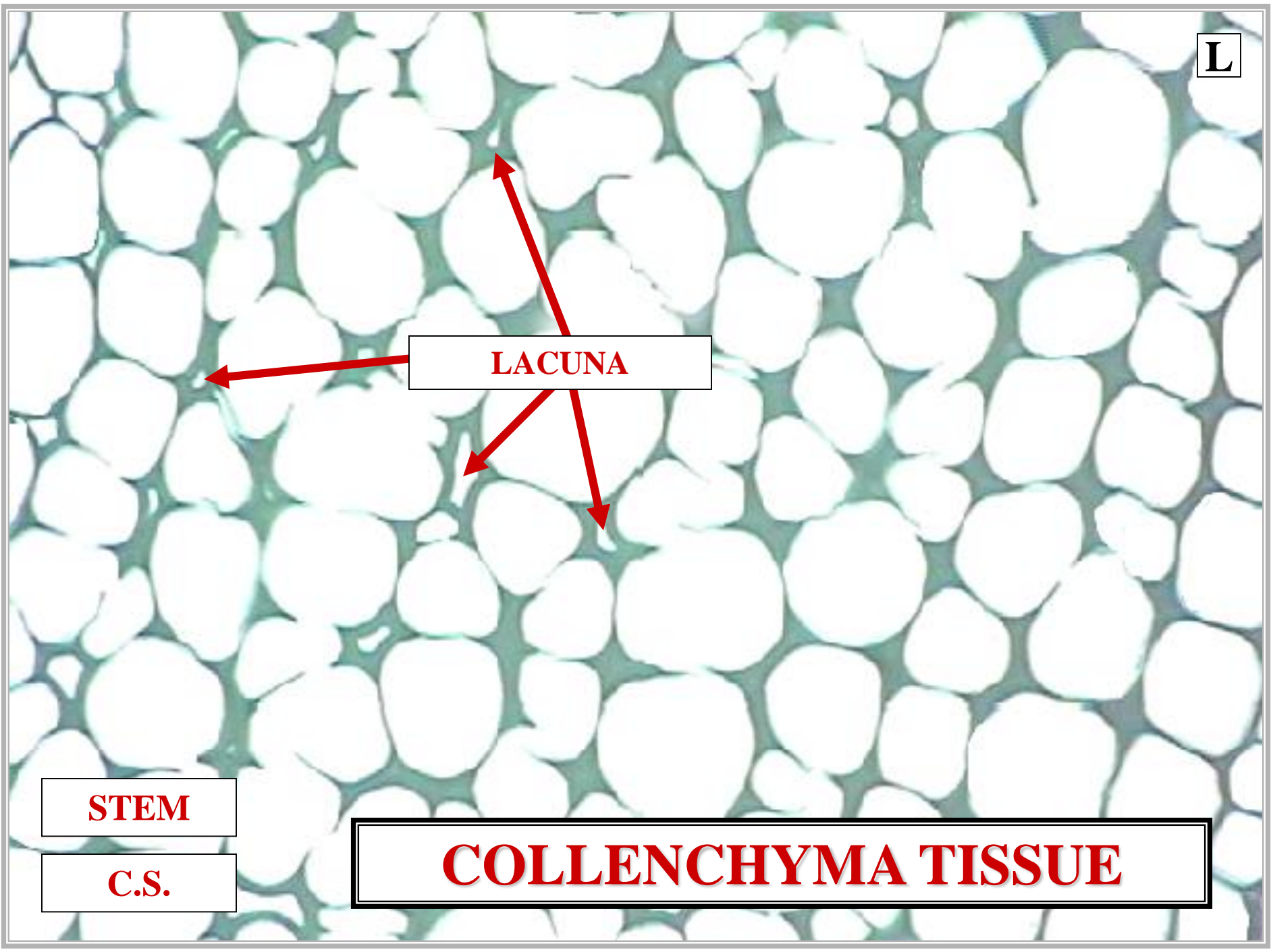
**L**

**LACUNA**

**STEM**

**C.S.**

**COLLENCHYMA TISSUE**



**LACUNA**

**LACUNA**



**L**

**+**

**INTERCELLULAR  
AIR SPACES**

**LACUNA**



LACUNA

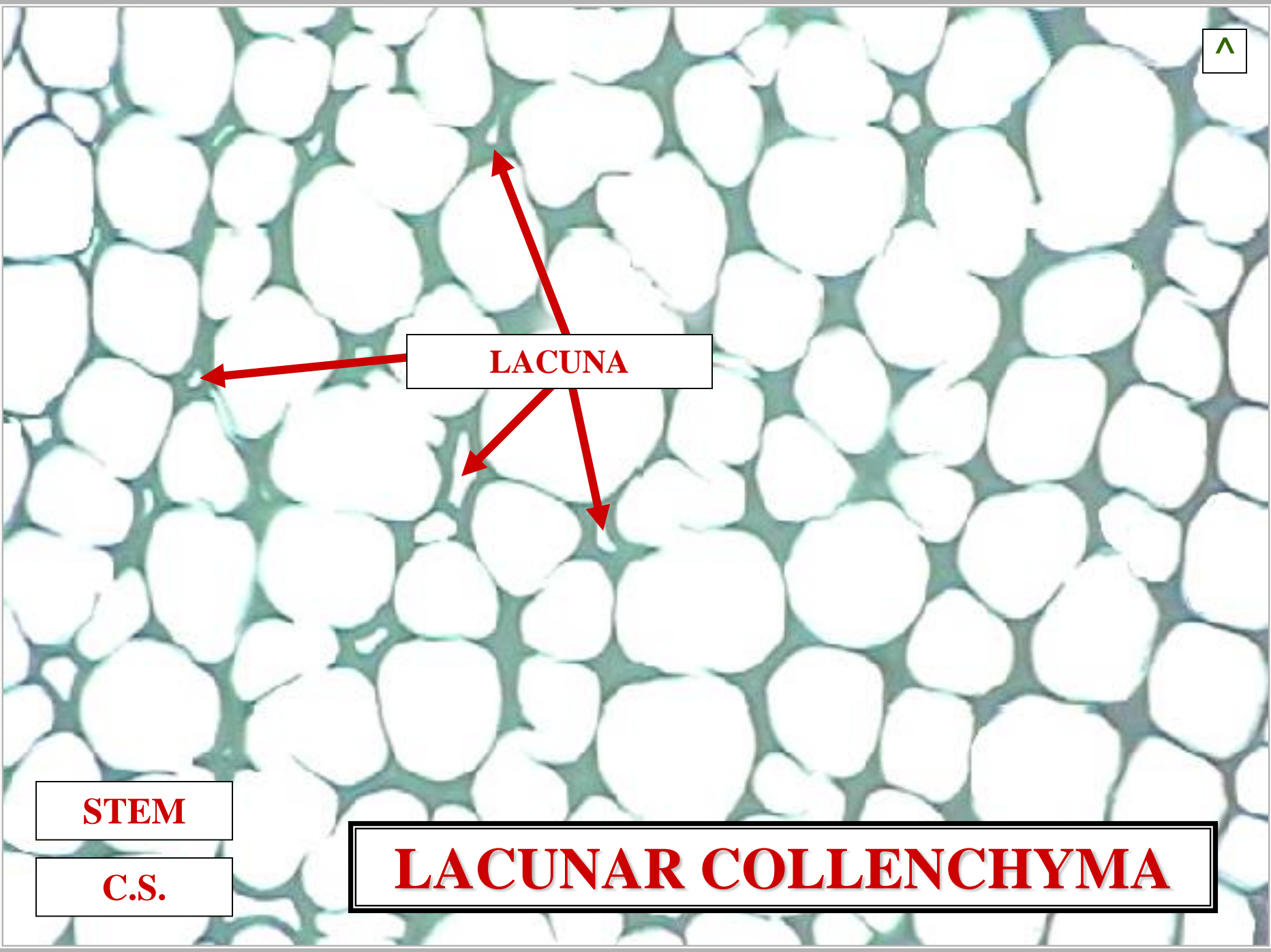
The image shows a micrograph of collenchyma tissue. The cells are roughly polygonal and arranged in a brickwork pattern. The corners of the cells are thickened, which is characteristic of collenchyma. Small, clear spaces between the cells are labeled as lacunae. Red arrows point from the central 'LACUNA' label to these spaces. The overall appearance is that of a dense, supportive tissue.

STEM

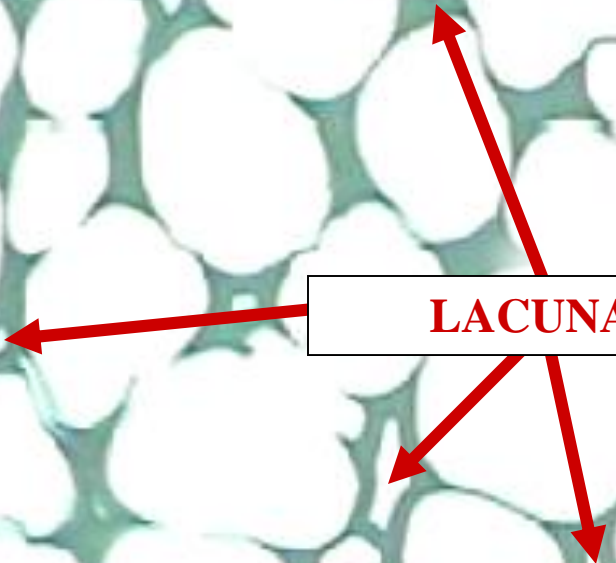
C.S.

**COLLENCHYMA TISSUE**





**LACUNA**



**STEM**

**C.S.**

**LACUNAR COLLENCHYMA**



# **SCLERENCHYMA TISSUE**



# SCLERENCHYMA CELLS

# **SCLERENCHYMA CELL**

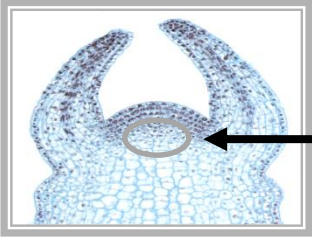
# **SCLERENCHYMA CELL**



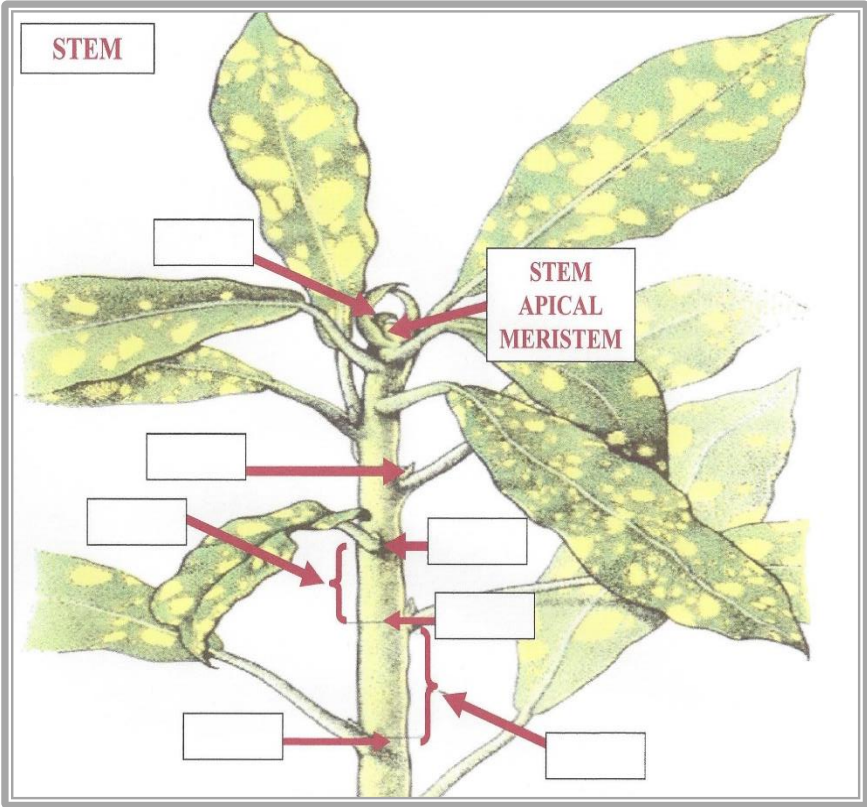
**PARENCHYMA DERIVED**

**SCLERENCHYMA  
CELL**

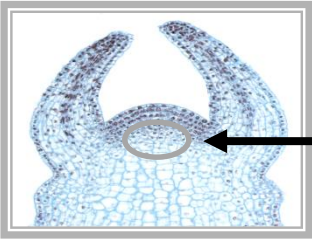
# STEM APICAL MERISTEM



STEM APICAL MERISTEM



# STEM APICAL MERISTEM



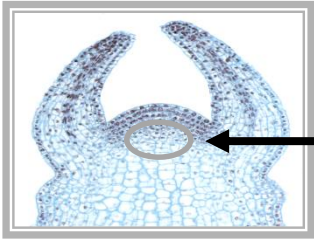
STEM APICAL MERISTEM



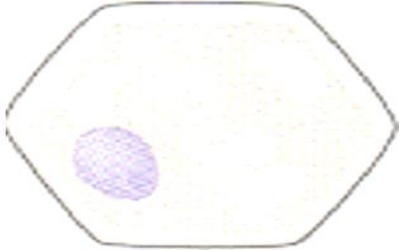
MERISTEM CELL INITIAL



**STEM APICAL  
MERISTEM**



**STEM APICAL MERISTEM**

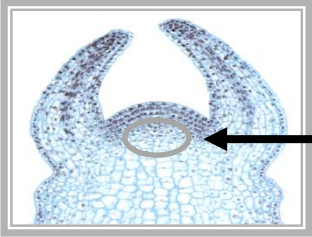


**MERISTEM CELL INITIAL**

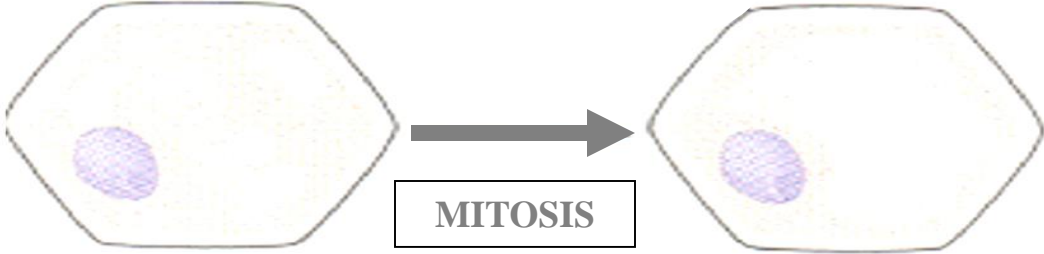
**PARENCHYMA CELL**

**PARENCHYMA  
BASIC  
PLANT CELL**

**STEM APICAL  
MERISTEM**



**STEM APICAL MERISTEM**



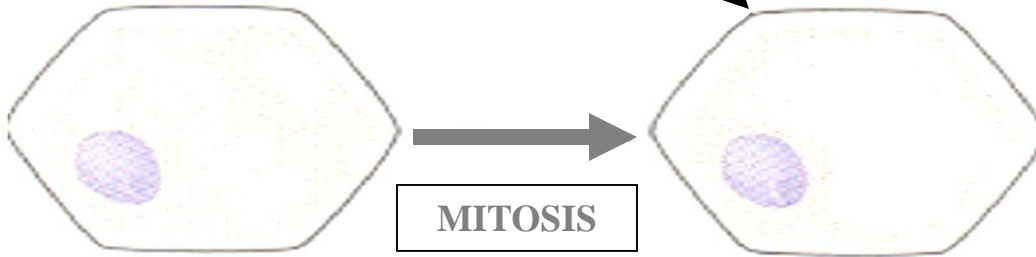
**MERISTEM CELL INITIAL**

**PARENCHYMA CELL**

**PARENCHYMA  
BASIC  
PLANT CELL**

**STEM APICAL  
MERISTEM**

**DERIVATIVE CELL**



**MERISTEM CELL INITIAL**

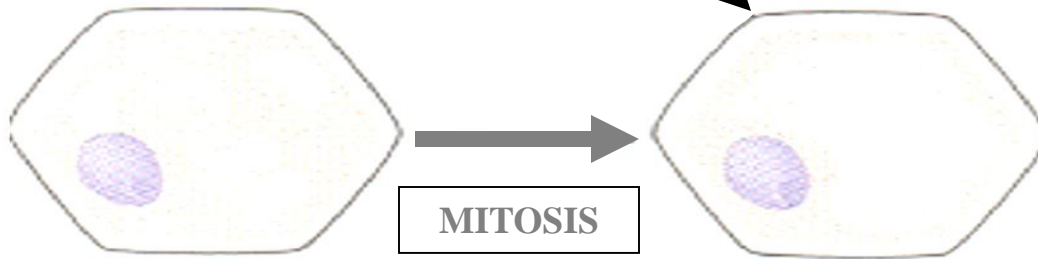
**PARENCHYMA CELL**

**PARENCHYMA  
BASIC  
PLANT CELL**

**STEM APICAL  
MERISTEM**

**DERIVATIVE CELL**

**PARENCHYMA CELL**



**MITOSIS**

**MERISTEM CELL INITIAL**

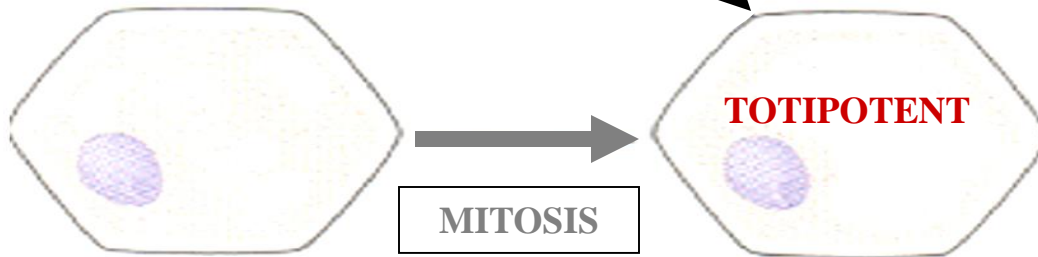
**PARENCHYMA CELL**

**PARENCHYMA  
BASIC  
PLANT CELL**

**STEM APICAL  
MERISTEM**

**DERIVATIVE CELL**

**PARENCHYMA CELL**



**PARENCHYMA CELL  
CAN POTENTIALLY  
DIFFERENTIATE  
INTO ANY PLANT CELL TYPE**

**MERISTEM CELL INITIAL**

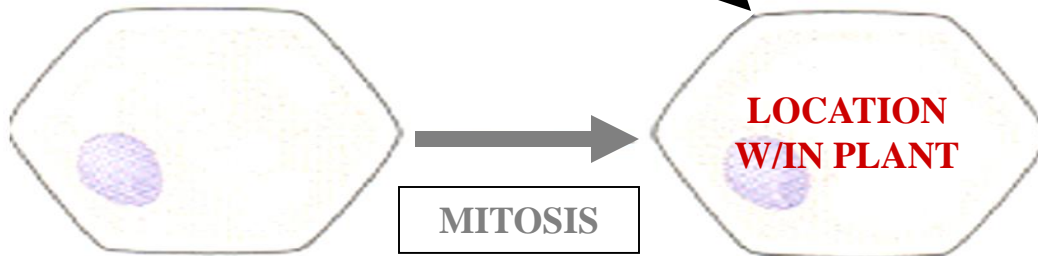
**PARENCHYMA CELL**

**PARENCHYMA  
BASIC  
PLANT CELL**

**STEM APICAL  
MERISTEM**

**DERIVATIVE CELL**

**PARENCHYMA CELL**



**PARENCHYMA CELL  
CAN POTENTIALLY  
DIFFERENTIATE  
INTO ANY PLANT CELL TYPE**

**MERISTEM CELL INITIAL**

**PARENCHYMA CELL**

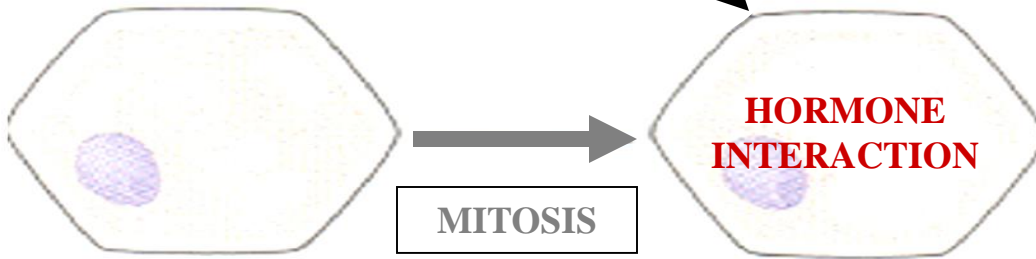
**PARENCHYMA  
BASIC  
PLANT CELL**



**STEM APICAL  
MERISTEM**

**DERIVATIVE CELL**

**PARENCHYMA CELL**



**PARENCHYMA CELL  
CAN POTENTIALLY  
DIFFERENTIATE  
INTO ANY PLANT CELL TYPE**

**MERISTEM CELL INITIAL**

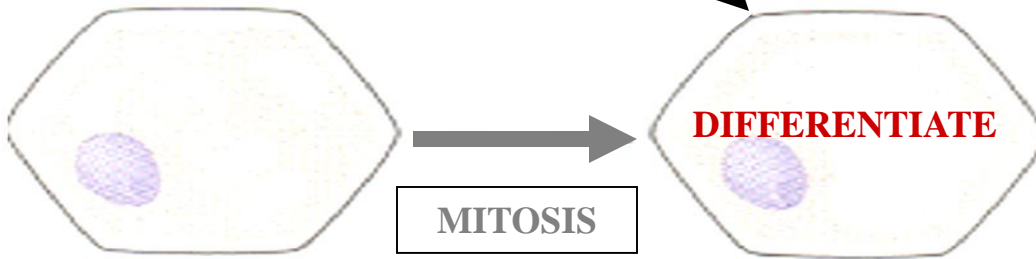
**PARENCHYMA CELL**

**PARENCHYMA  
BASIC  
PLANT CELL**

**STEM APICAL  
MERISTEM**

**DERIVATIVE CELL**

**PARENCHYMA CELL**



**PARENCHYMA CELL  
CAN POTENTIALLY  
DIFFERENTIATE  
INTO ANY PLANT CELL TYPE**

**MERISTEM CELL INITIAL**

**PARENCHYMA CELL**

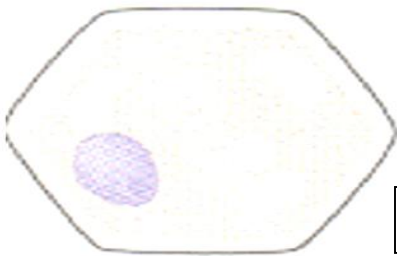
**PARENCHYMA  
BASIC  
PLANT CELL**



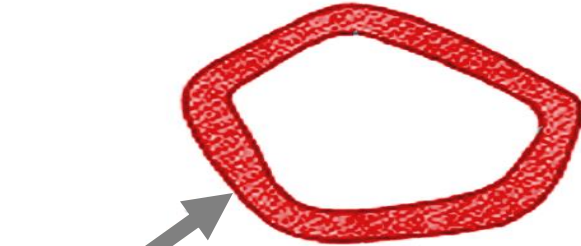
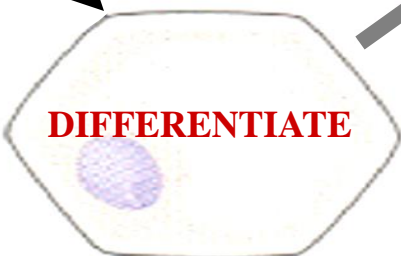
**STEM APICAL  
MERISTEM**

**DERIVATIVE CELL**

**PARENCHYMA CELL**



**MITOSIS**



**SCLERENCHYMA CELLS**

**MERISTEM CELL INITIAL**

**PARENCHYMA CELL**

**PARENCHYMA  
BASIC  
PLANT CELL**



# SCLERENCHYMA CELL CHARACTERS

**D**



**FRUIT**

**C.S.**

**SCLERENCHYMA  
CELL**





**FRUIT**

**C.S.**

**SCLERENCHYMA  
CELL  
DEAD FUNCTIONAL  
CELL**

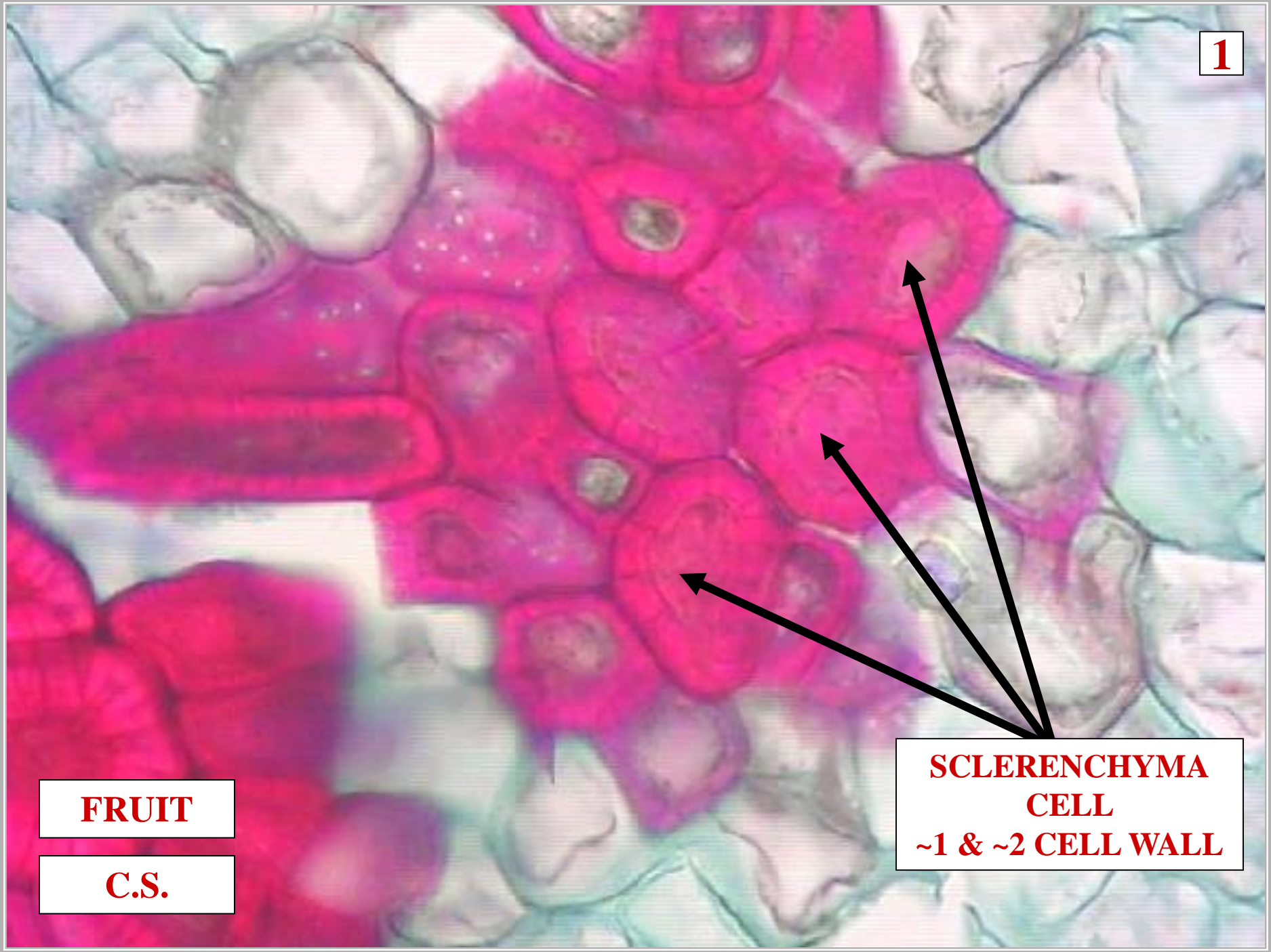


**1**

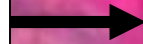
**FRUIT**

**C.S.**

**SCLERENCHYMA  
CELL  
~1 & ~2 CELL WALL**



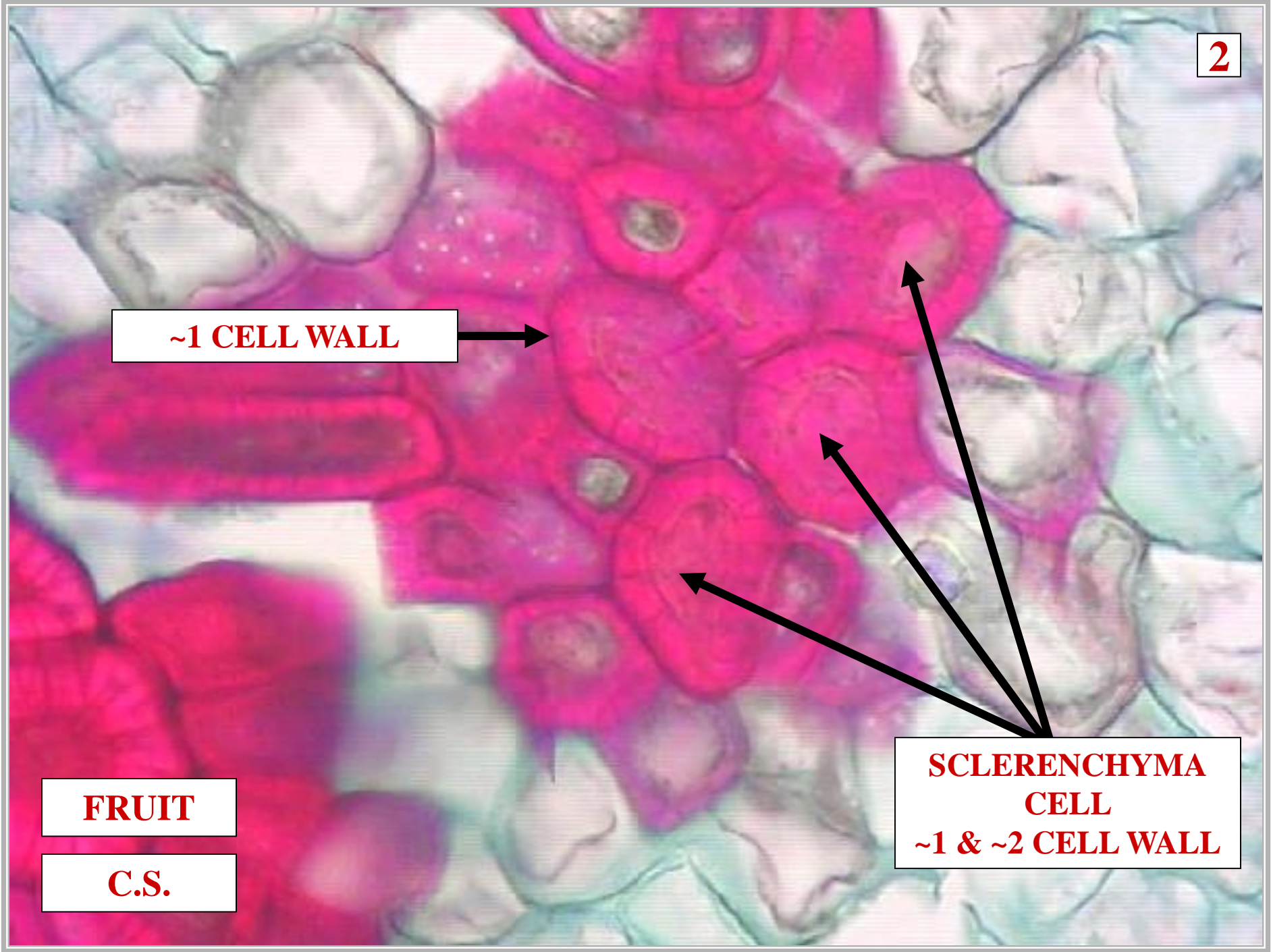
**~1 CELL WALL**



**FRUIT**

**C.S.**

**SCLERENCHYMA  
CELL  
~1 & ~2 CELL WALL**





**T**

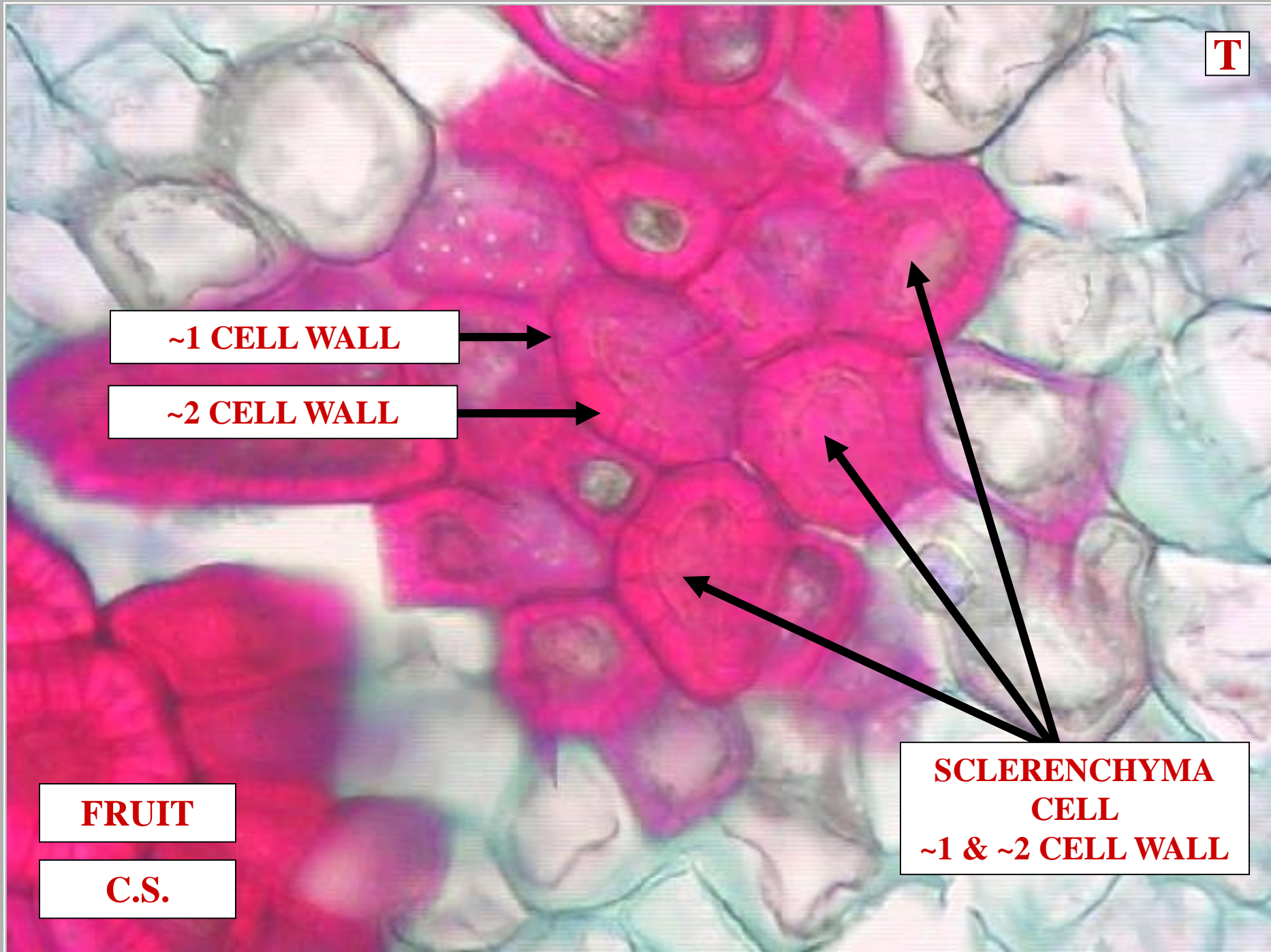
**~1 CELL WALL**

**~2 CELL WALL**

**FRUIT**

**C.S.**

**SCLERENCHYMA  
CELL  
~1 & ~2 CELL WALL**



**L**

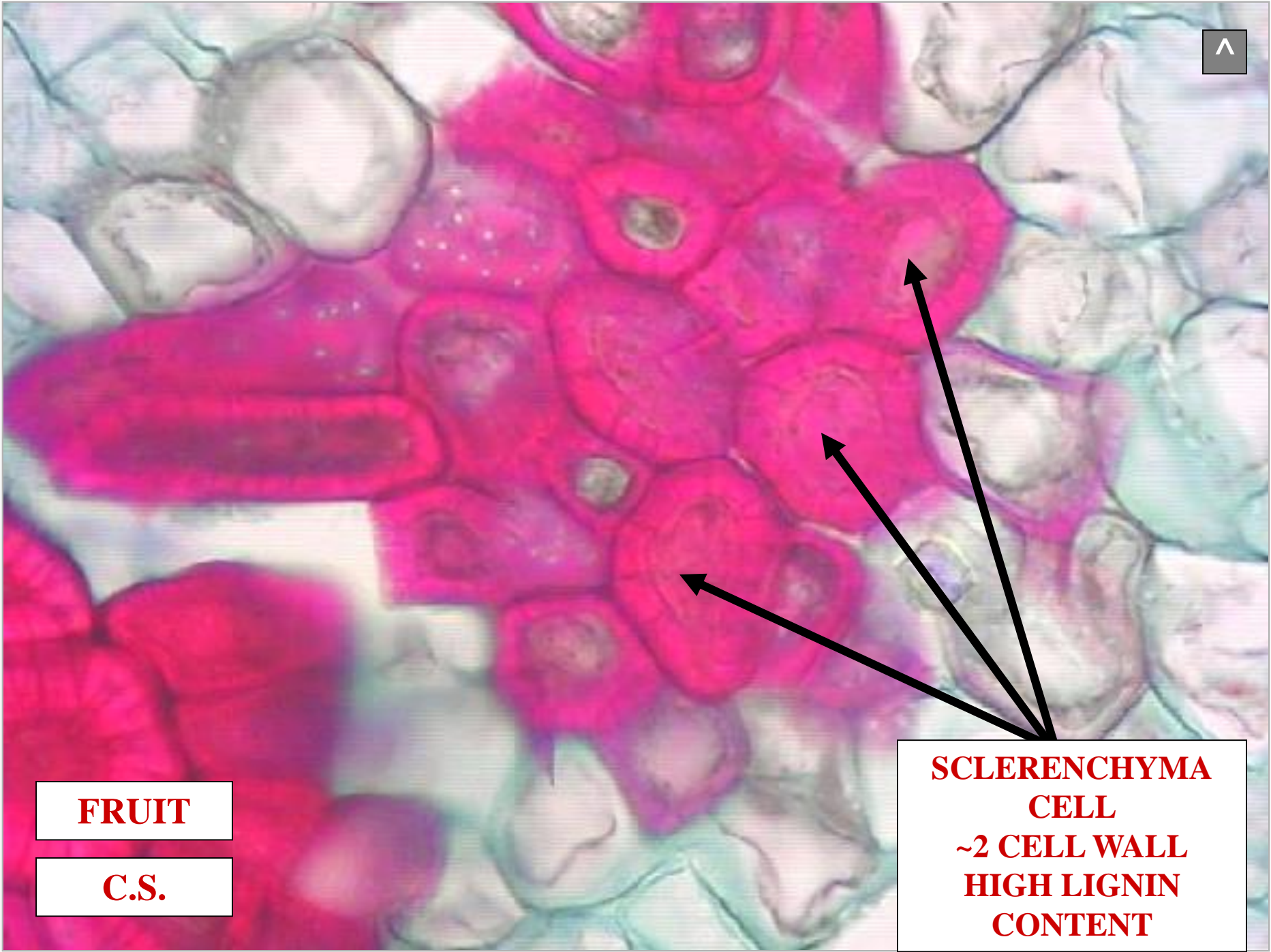
**FRUIT**

**C.S.**

**SCLERENCHYMA  
CELL  
~2 CELL WALL  
THICK**







**FRUIT**

**C.S.**

**SCLERENCHYMA  
CELL  
~2 CELL WALL  
HIGH LIGNIN  
CONTENT**

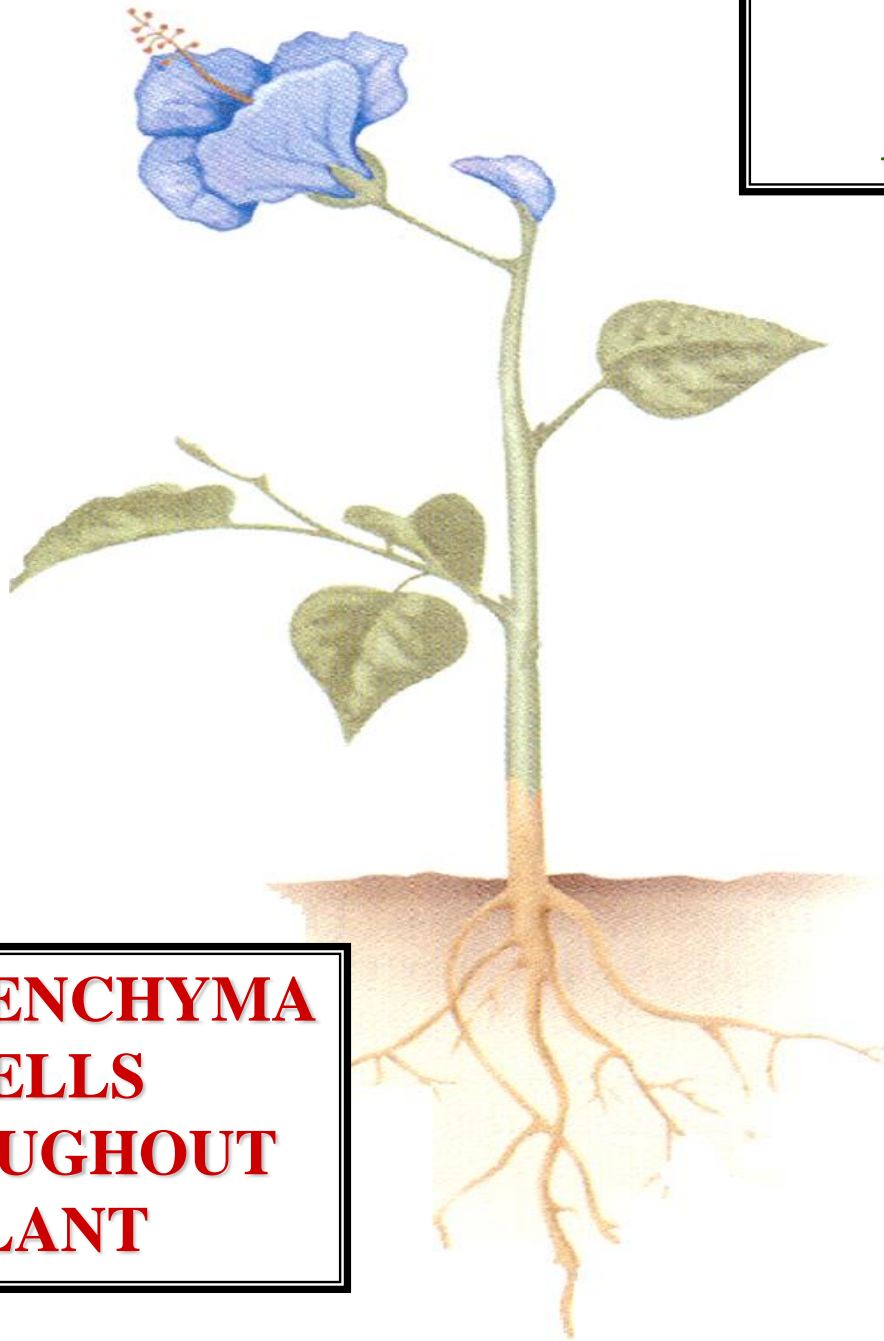


# SCLERENCHYMA CELL DISTRIBUTION



# TYPICAL ANGIOSPERM

L



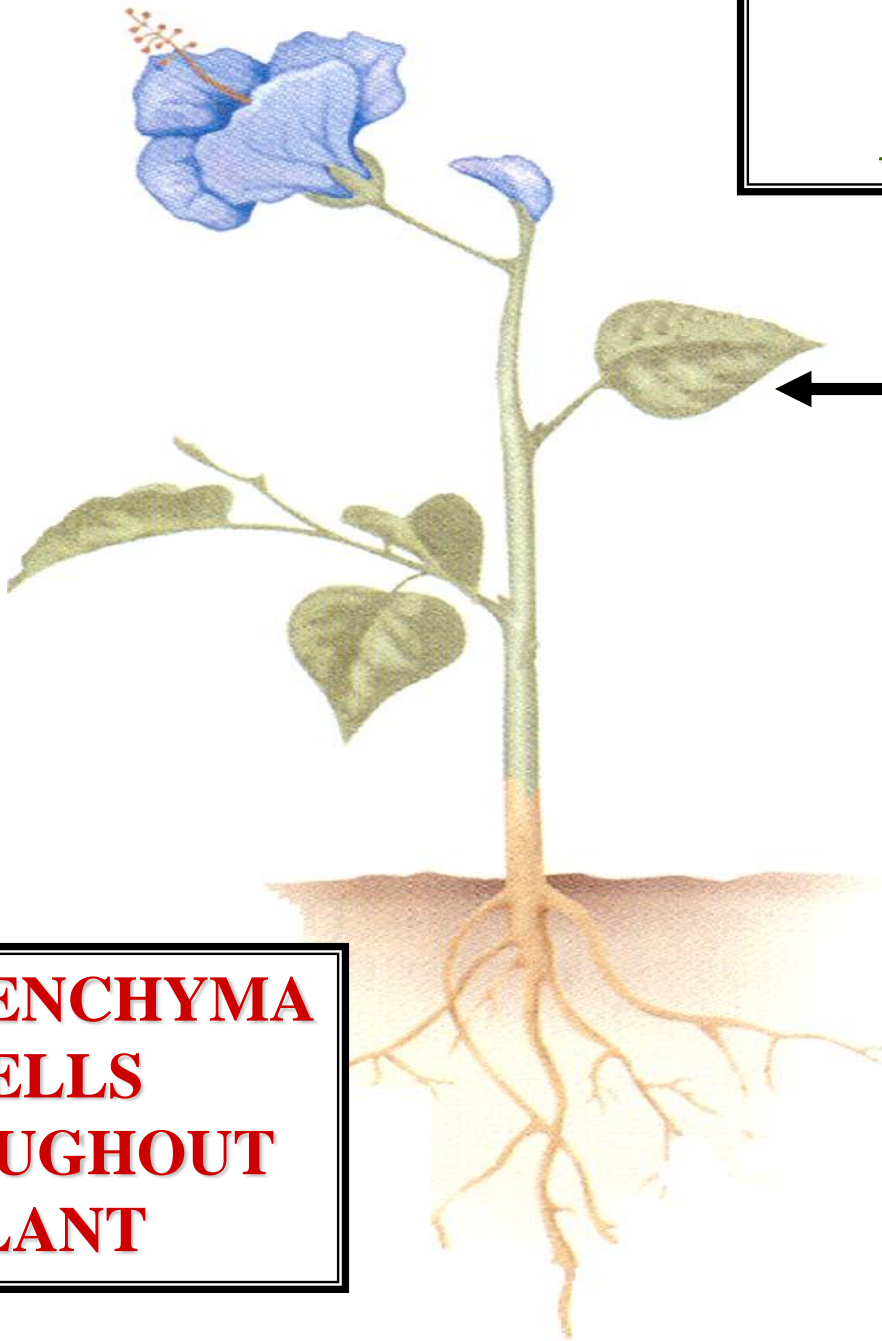
**SCLERENCHYMA  
CELLS  
THROUGHOUT  
PLANT**

**TYPICAL  
ANGIOSPERM**

**S**

**LEAF**

**SCLERENCHYMA  
CELLS  
THROUGHOUT  
PLANT**



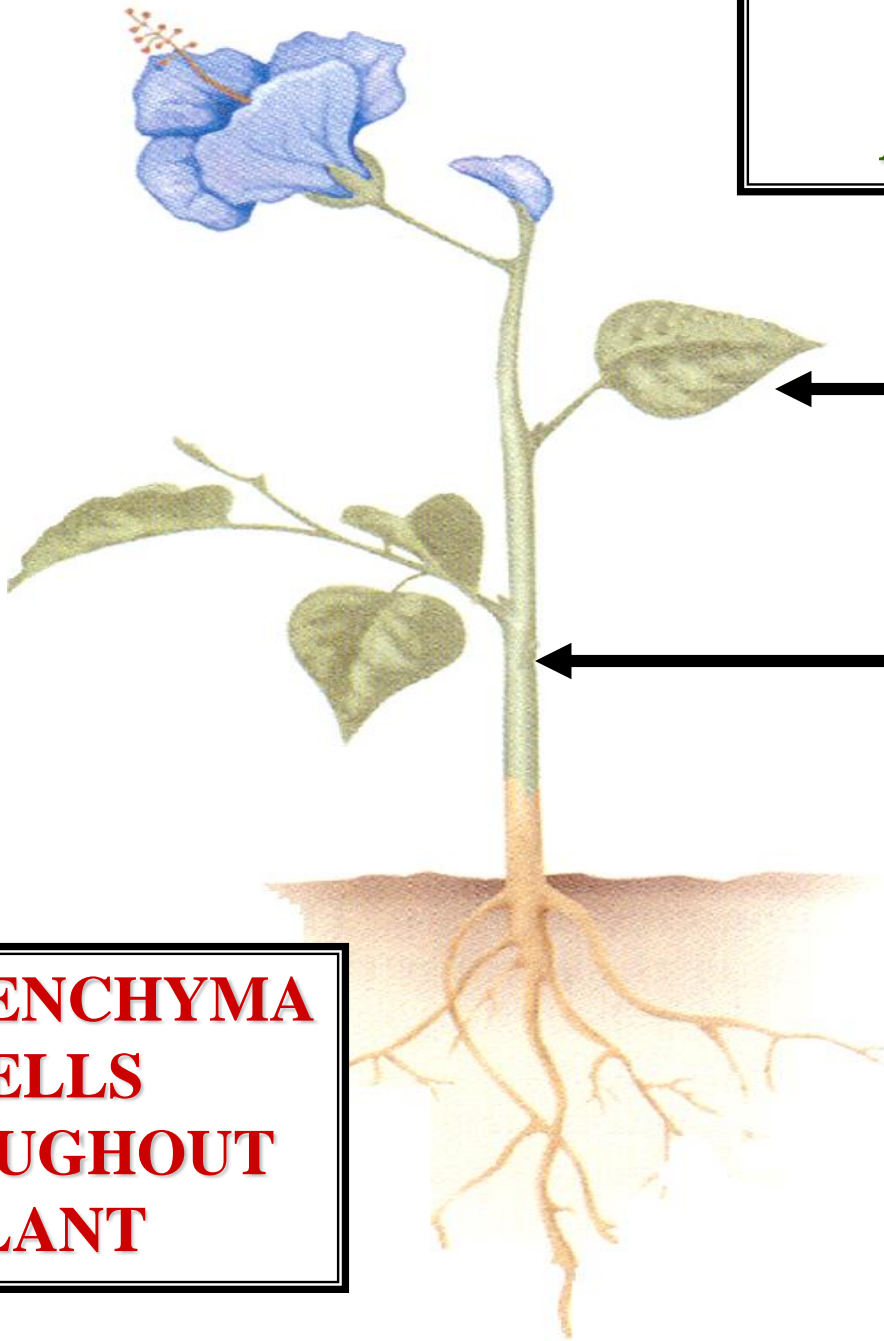
**TYPICAL  
ANGIOSPERM**

**R**

**LEAF**

**STEM**

**SCLERENCHYMA  
CELLS  
THROUGHOUT  
PLANT**



**TYPICAL  
ANGIOSPERM**

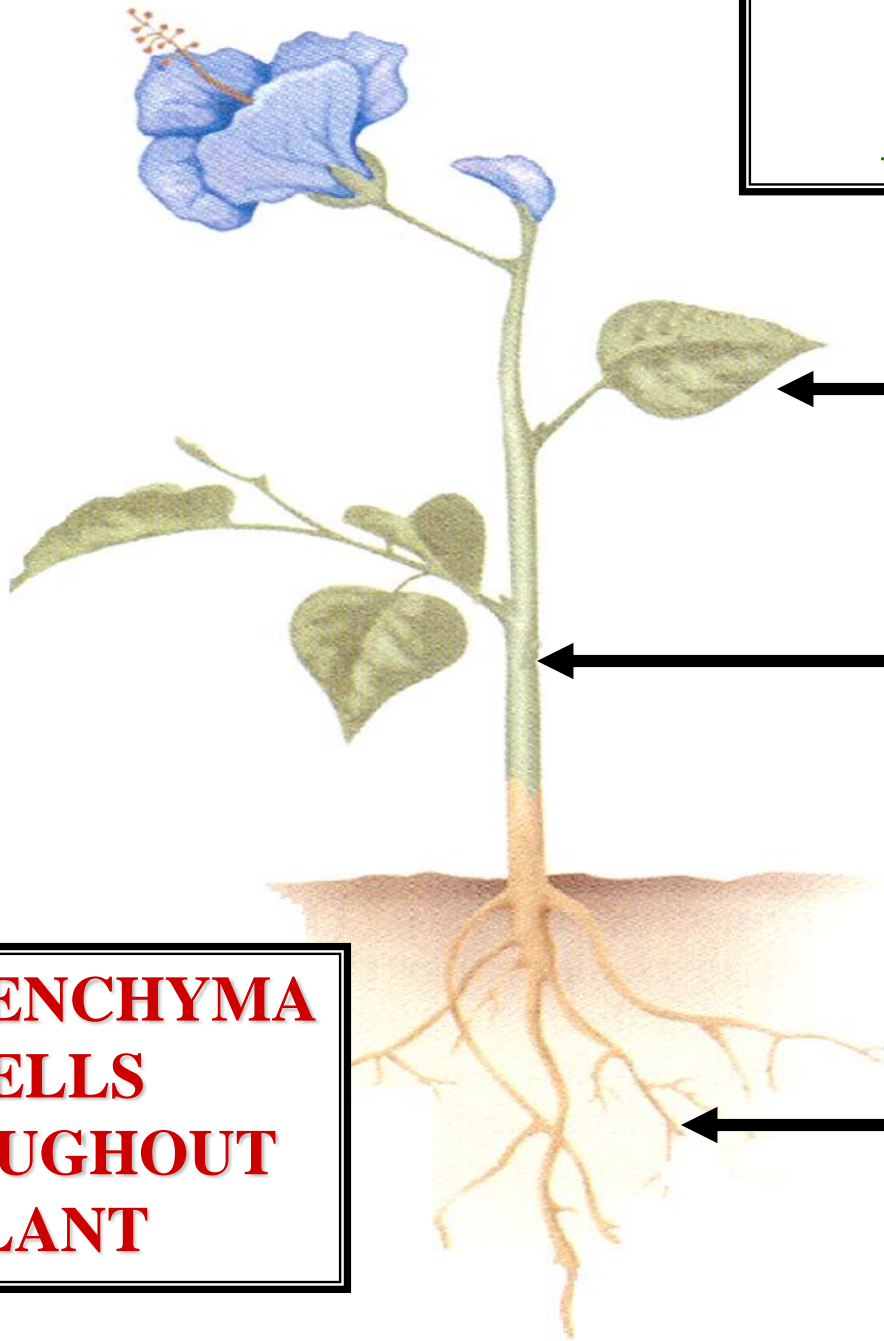


**LEAF**

**STEM**

**ROOT**

**SCLERENCHYMA  
CELLS  
THROUGHOUT  
PLANT**





# SCLERENCHYMA CELL FUNCTION

# TYPICAL ANGIOSPERM



**LEAF**

**SCLERENCHYMA FUNCTION VARIOUS**

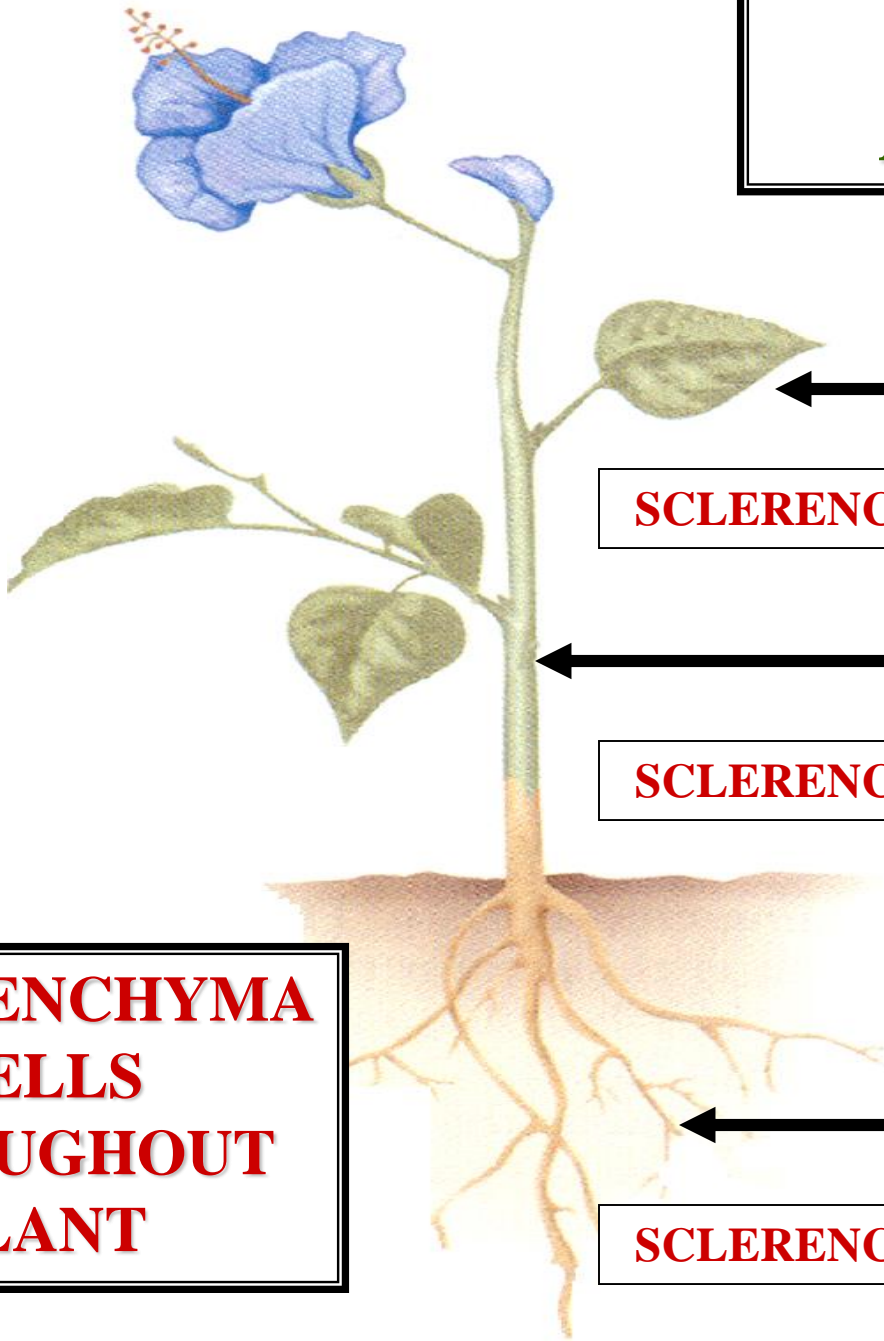
**STEM**

**SCLERENCHYMA FUNCTION VARIOUS**

**ROOT**

**SCLERENCHYMA FUNCTION VARIOUS**

**SCLERENCHYMA  
CELLS  
THROUGHOUT  
PLANT**





# SCLERENCHYMA CELL TYPES

# **SCLERENCHYMA CELL TYPES**

**FIBERS**

**SCLERENCHYMA CELL  
TYPES**

# **SCLERENCHYMA CELL TYPES**



**FIBERS**

**SCLEREIDS**

**SCLERENCHYMA CELL  
TYPES**



# FIBERS

# FIBER CELL SHAPE



L.S.

# FIBER CELL SHAPE



**SHAPE: LONG & SLENDER**

**L.S.**



# FIBER CELL TYPES

# **FIBER CELL TYPES**

**LIBRIFORM FIBER**

# **FIBER CELL TYPES**

# **FIBER CELL TYPES**

**LIBRIFORM FIBER**  
**TRACHEID FIBER**

# **FIBER CELL TYPES**

**LIBRIFORM FIBER**



# **LIBRIFORM FIBER**

**VERY LONG & SLENDER**

**---**

**FEW PITS**

**LIBRIFORM FIBER**



# FIBER CELLS



**VERY LONG & SLENDER**

**LIBRIFORM FIBER**

**L.S.**

# FIBER CELLS



**FEW PITS**

**LIBRIFORM FIBER**

**L.S.**

**TRACHEID FIBER**



# TRACHEID FIBER

LESS LONG & SLENDER

---

MANY PITS

# TRACHEID FIBER

# FIBER CELLS



**LESS LONG & SLENDER**

**VERY LONG & SLENDER**



**TRACHEID FIBER**

**LIBRIFORM FIBER**

**L.S.**

# FIBER CELLS



**MANY PITS**

**FEW PITS**

**TRACHEID FIBER**

**LIBRIFORM FIBER**

**L.S.**



**SEPTA**

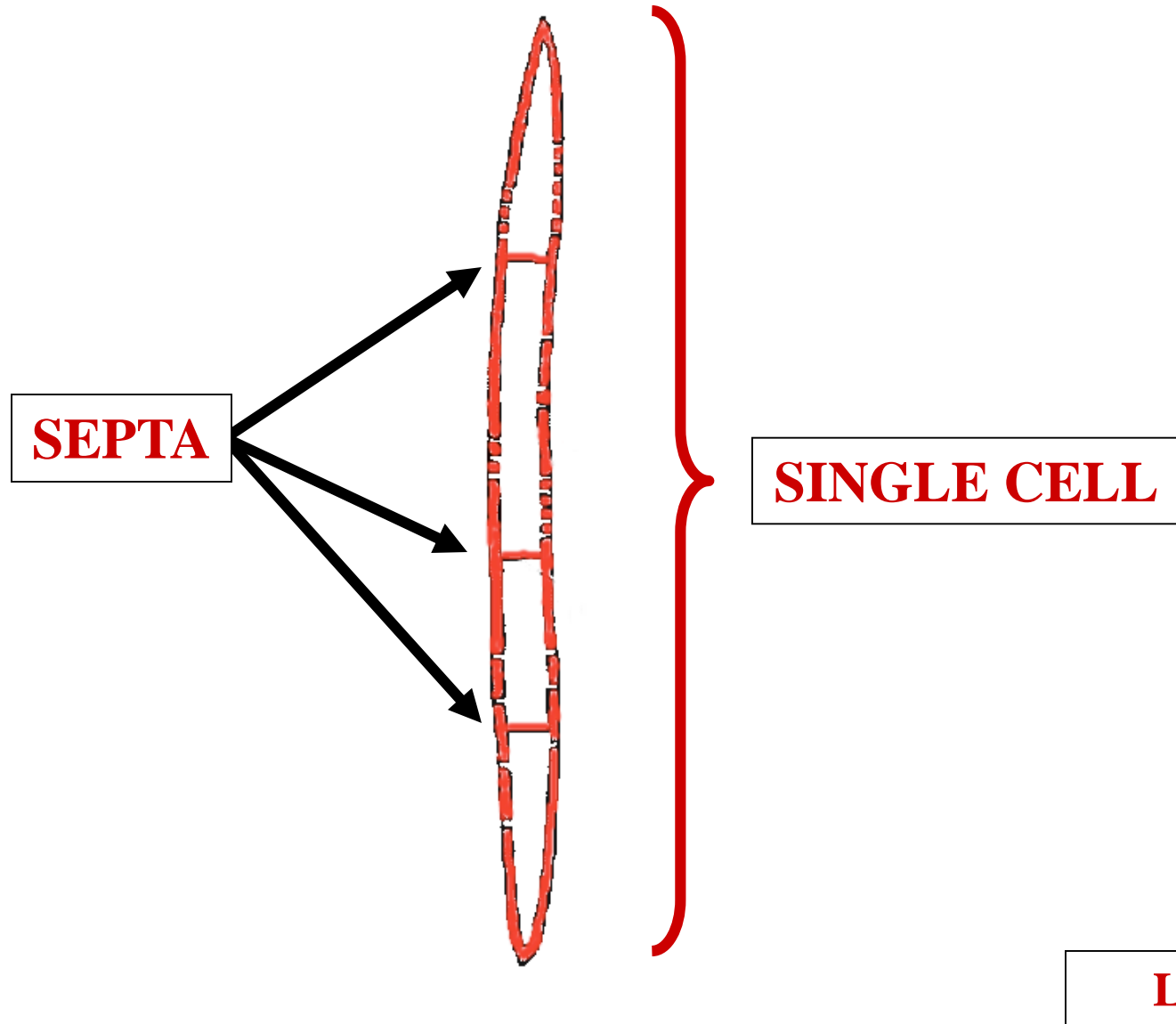
# FIBER CELL SEPTA



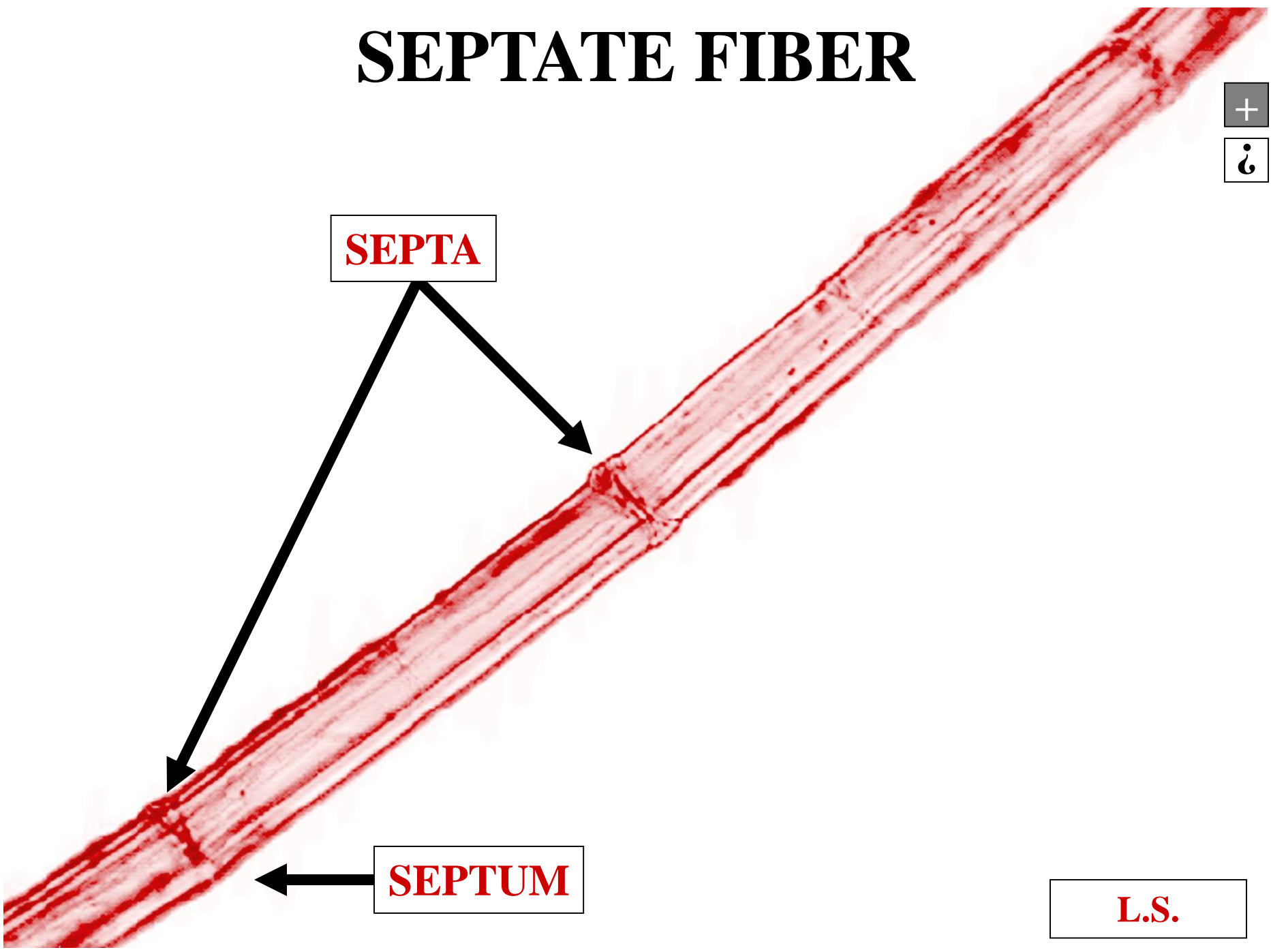
CELL CROSS WALLS

FIBER CELL  
SEPTA

# SEPTATE FIBER



# SEPTATE FIBER



**SEPTA**

**SEPTUM**

**L.S.**



# SEPTATE FIBER

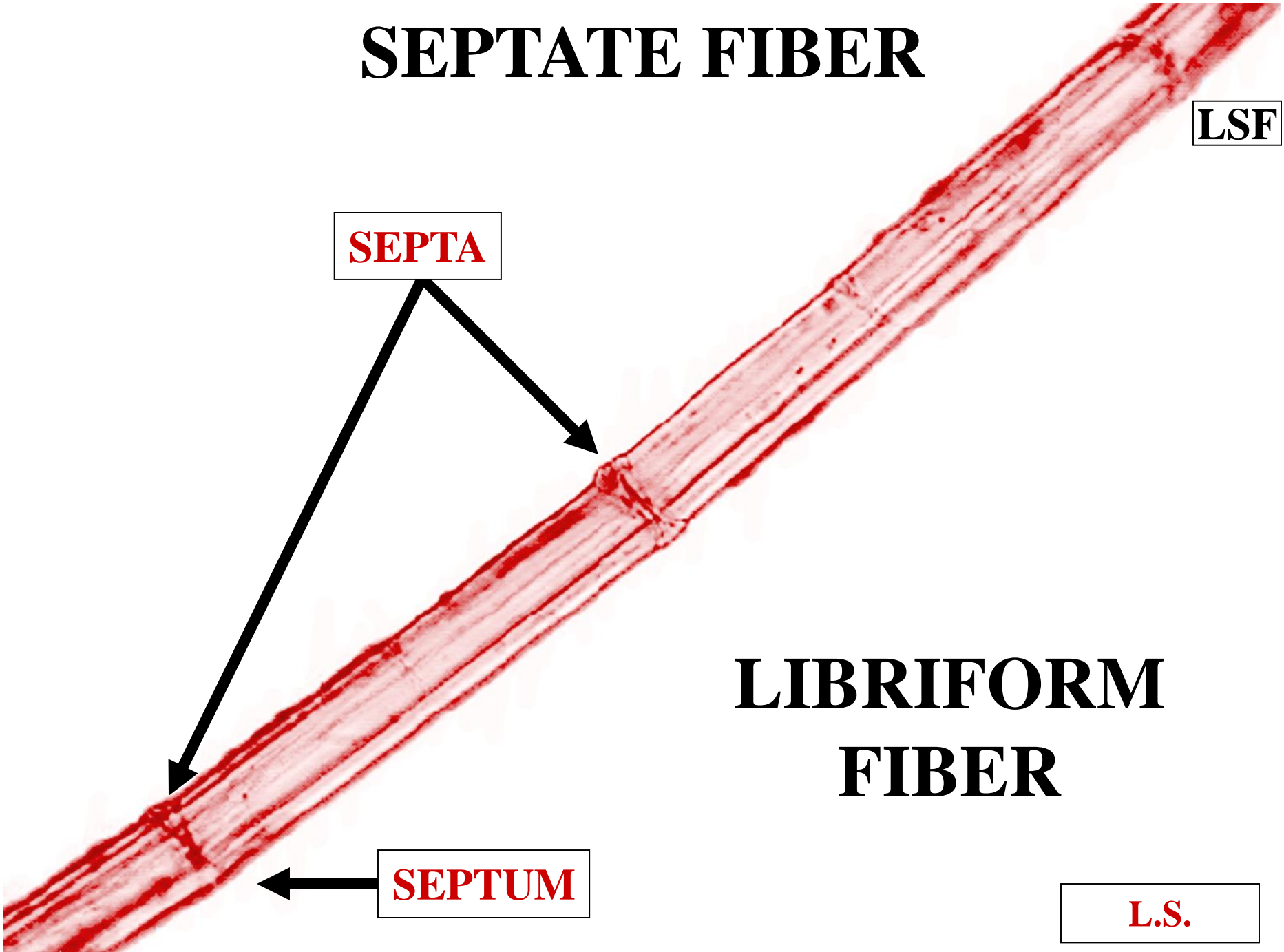
LSF

SEPTA

LIBRIFORM  
FIBER

SEPTUM

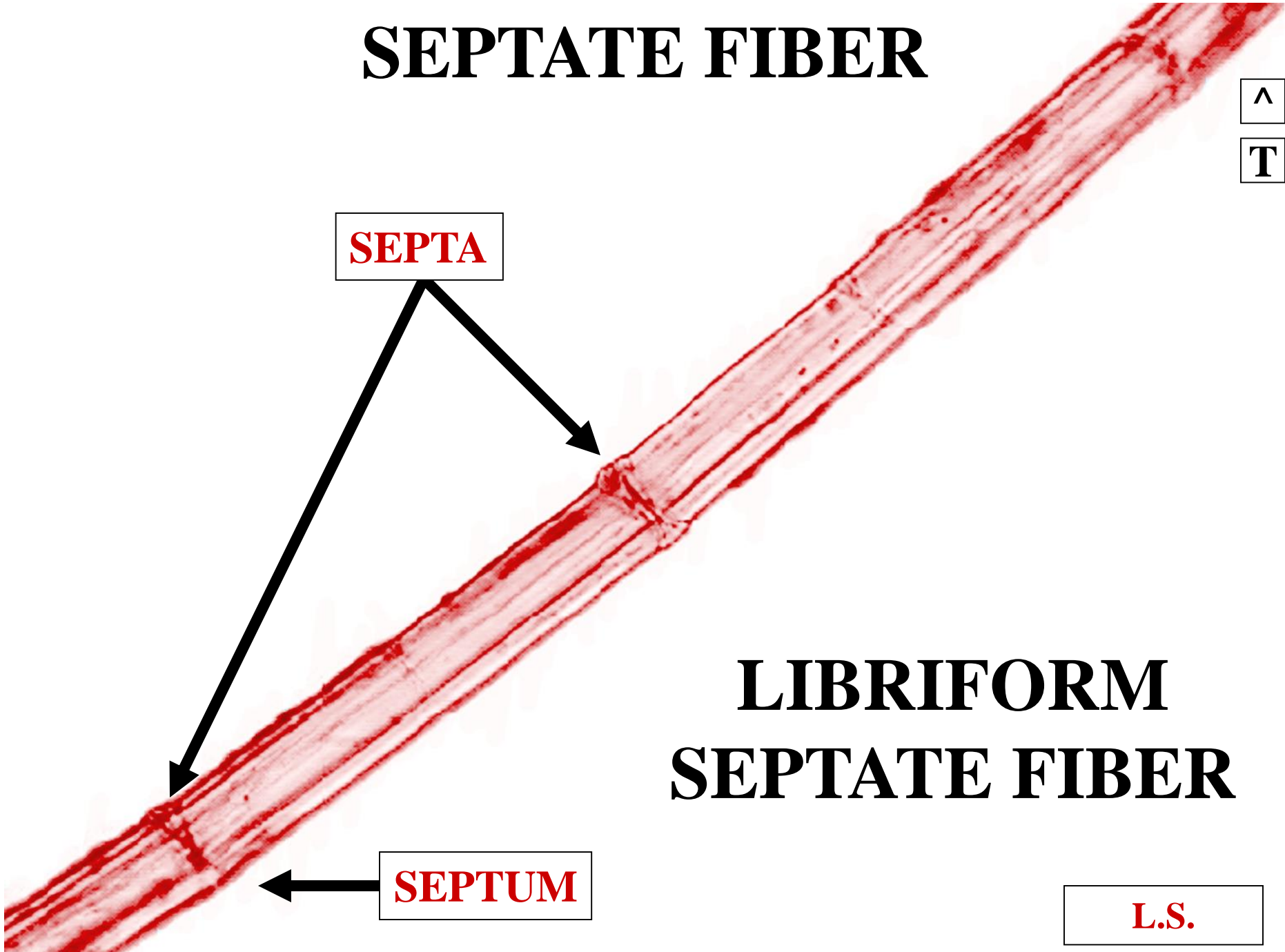
L.S.



# SEPTATE FIBER

^  
T

SEPTA



# LIBRIFORM SEPTATE FIBER

SEPTUM

L.S.



# SEPTATE FIBER

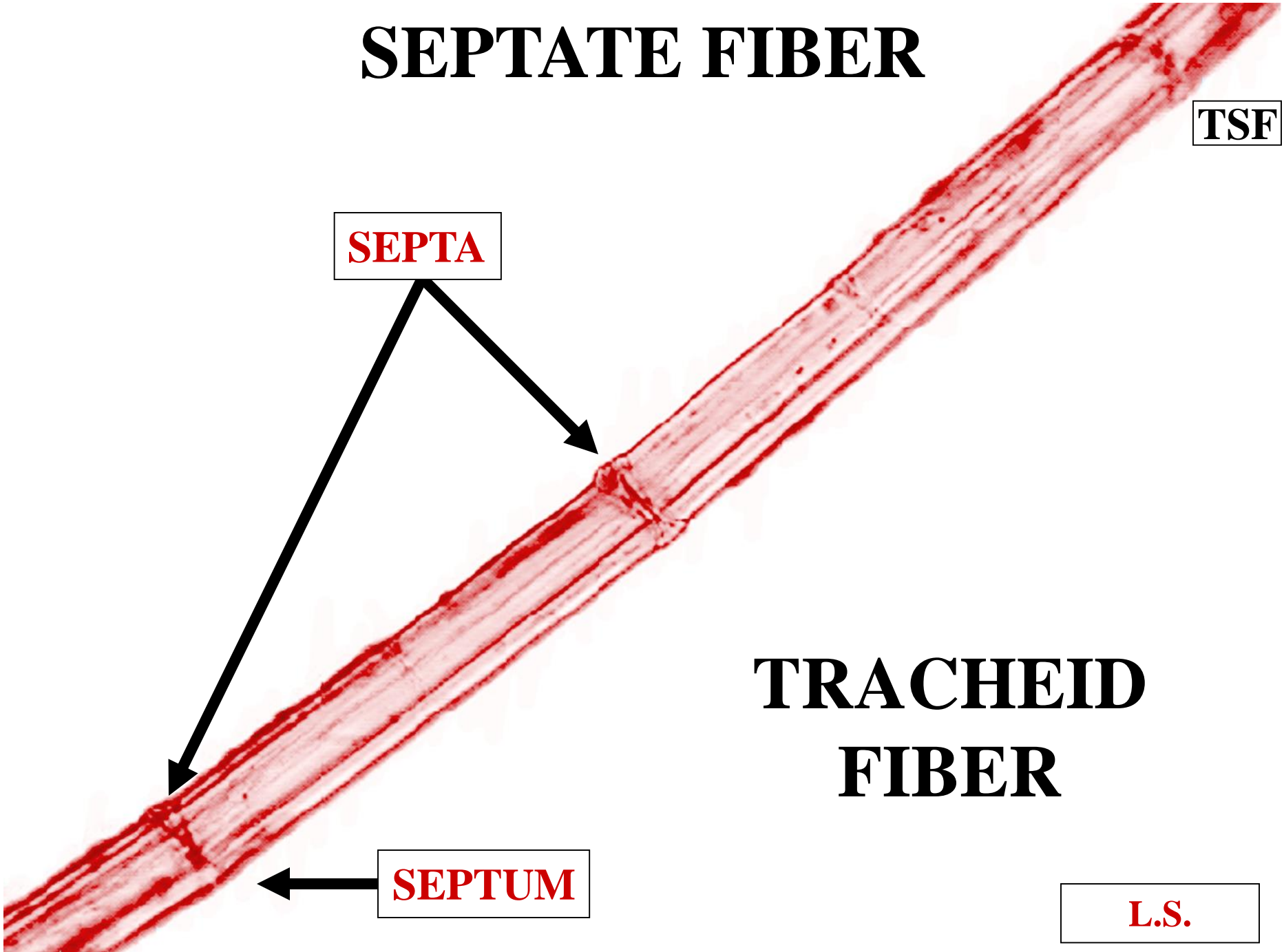
TSF

SEPTA

TRACHEID  
FIBER

SEPTUM

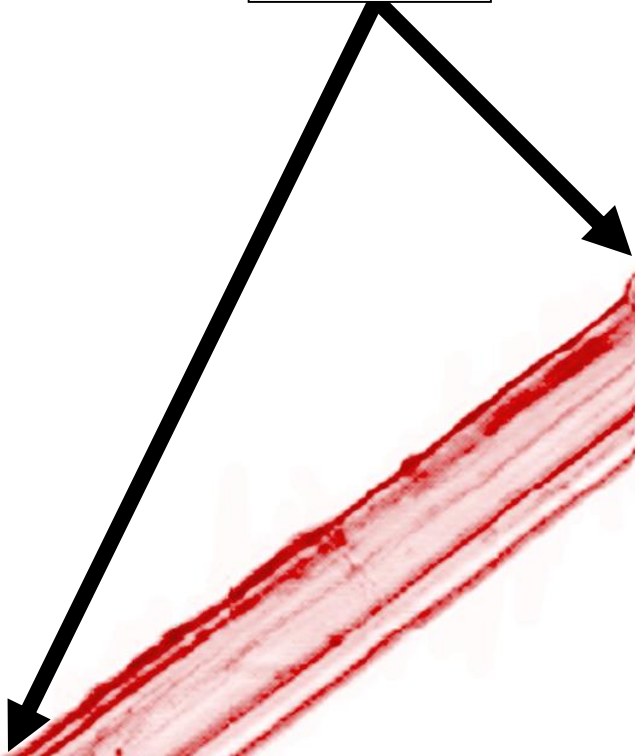
L.S.



# SEPTATE FIBER



**SEPTA**

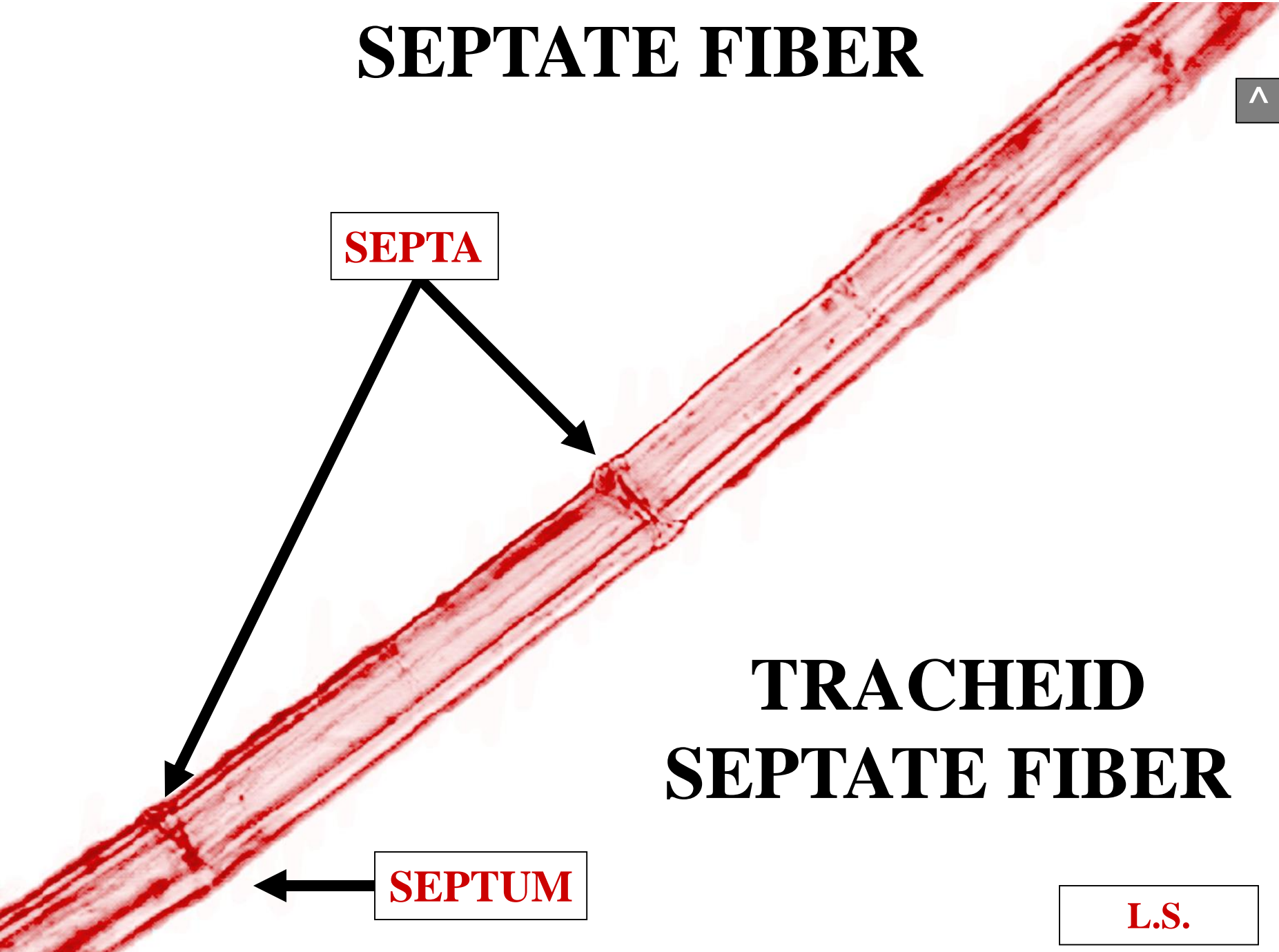


**TRACHEID  
SEPTATE FIBER**

**SEPTUM**

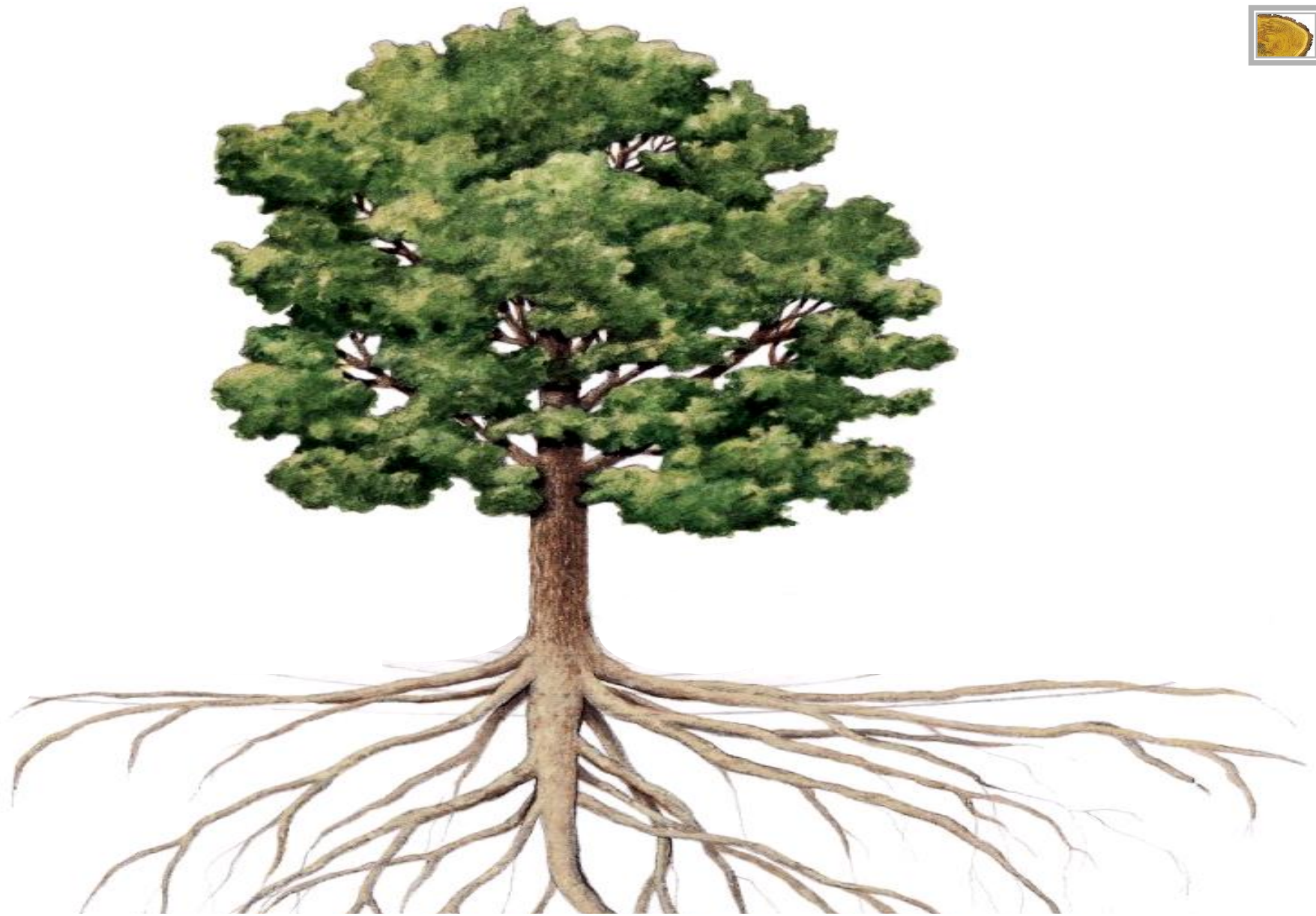


**L.S.**





# FIBER FUNCTION



**WOODY PLANT**