

Excitation Contraction Coupling:

Definition:

⇒ The coupling of an electrical event with mechanical event through a chemical messenger.

Steps:

⇒ When AP reaches the tip of T tubulus, it activates the voltage gated channels → DHPR (Dihydropyridine Receptors) located on T

Table membrane

⇒ Activated DHPR in turn triggers the opening of Ca^{2+} Release channels. (RyR) → Ryanodine Receptor located on terminal cisterns;

⇒ This is possible as these two receptors are mechanically interlocked.
⇒ Thus activation of DHPR by depolarization of T tubulus results in opening of RyR Receptors i.e. Ca^{2+} Release takes place.

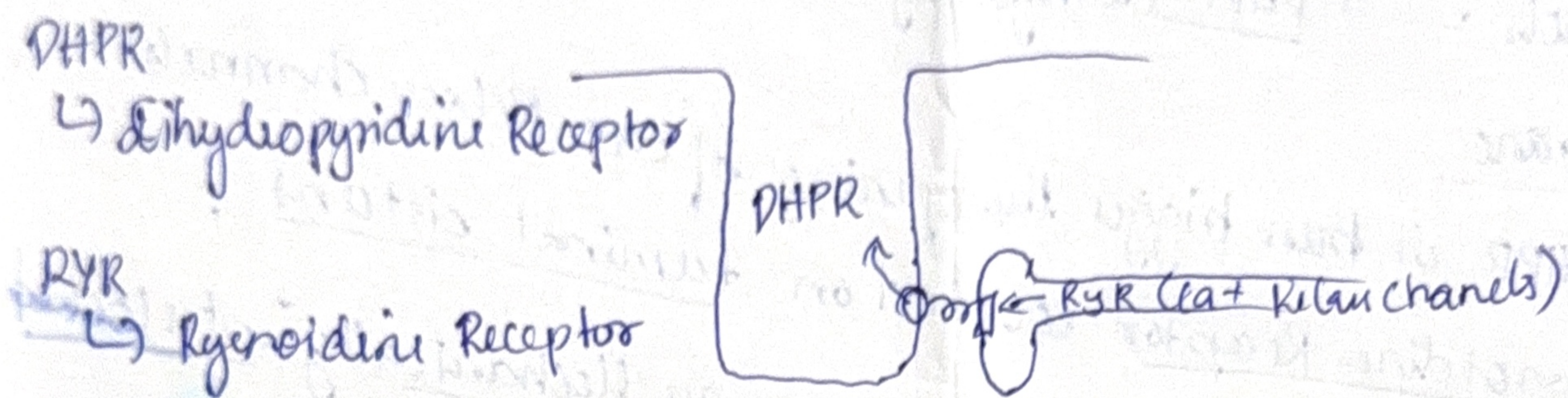
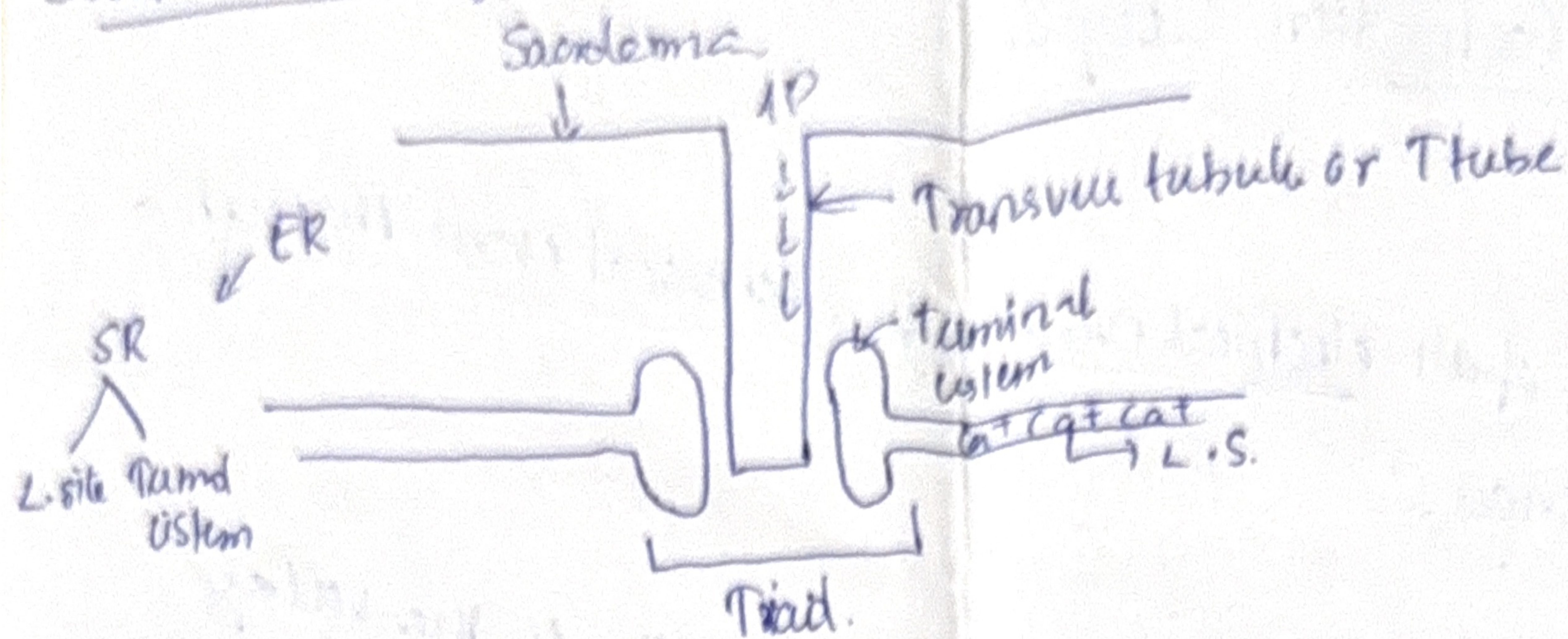
↓
 Ca^{2+} ions Release into sarcoplasm.

↓
 Ca^{2+} ions get attached to troponin C.

↓
produce contraction.

⇒ When Repolarization occurs SERCA receptors allow Ca^{2+} to move into SR from sarcoplasm which ↑ Ca^{2+} conc in SR. → Troponin C → MC

Sarcotubular System



DHPR are Mechanically connected to RYR

When A.P propagate it stimulates DHPR of pulls the RYR.
As, there ↑ amount of Ca^{+} in SR. so then move out of entire the sarcoplasm.

⇒ Ca^{+} will occur.

↳ ∞ Ca is Acting As a coupling Agent.

↓
TTC → HL.

When No stimulus → Ca^{+} Release channel close

Ca pumped back via SERCA (from sarcoplasm)

↓
 Ca bind with calsequestrin.