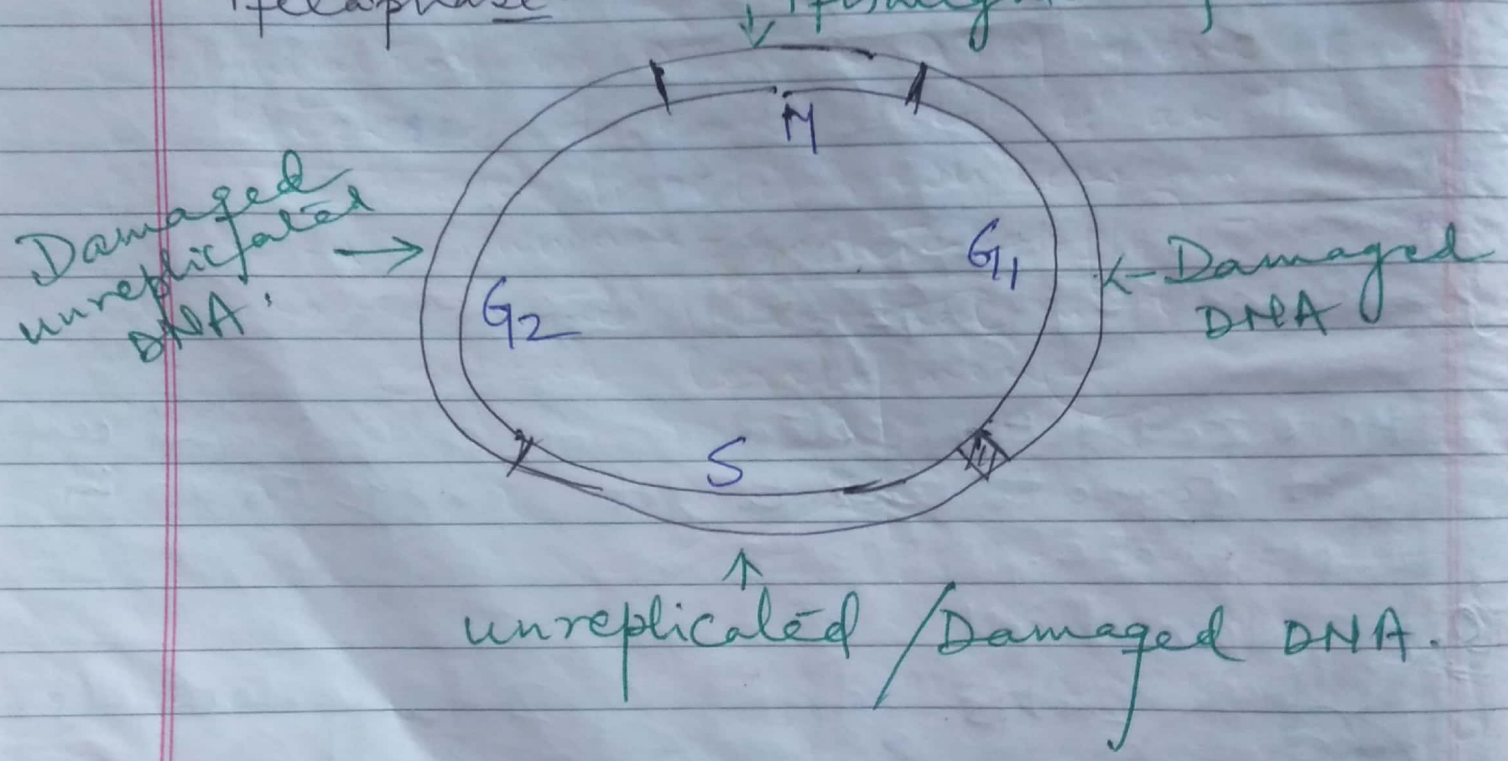
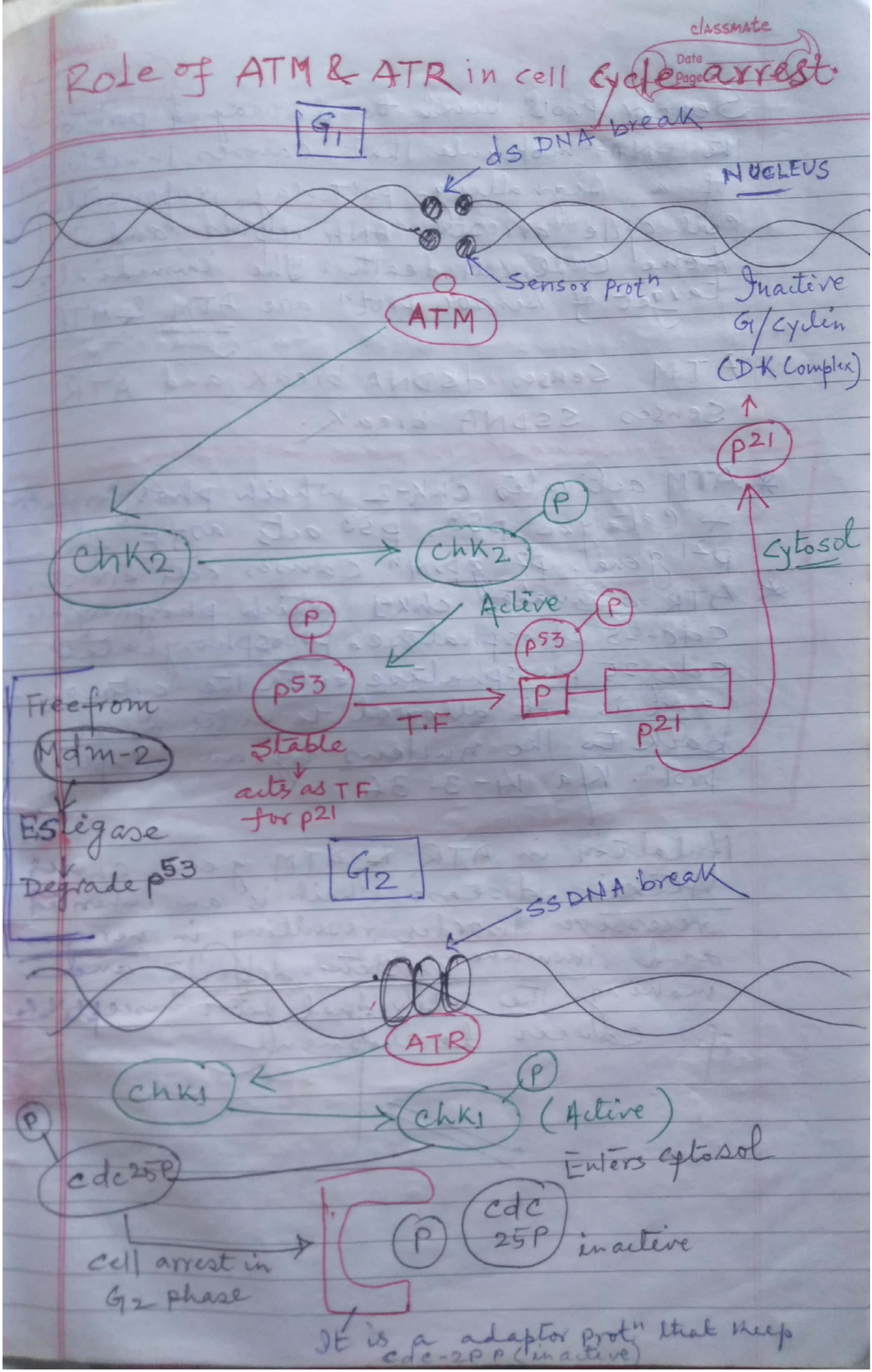
Cell Cycle check Point

check points are the processes that regulates the progression of cell cycle. It provides cell cycle arrest if any of the following observation is seen: ——

1. Presence of damage DNA.
2. presence of unreplicated DNA.
3. Misalignment of chromosome during Metaphase.



Role of ATM & ATR in cell cycle arrest



Sensor protⁿ bind to damaged portion of the DNA molecule that causes inactivation of a signalling pathway responsible for cell cycle arrest, DNA repair and in some case, cell death. The immediate target of sensor protⁿ are ATM & ATR

ATM senses dsDNA break and ATR senses SSDNA break.

* ATM activates chk-2 which phosphorylate & catalyze p53. p53 acts as TF for p21 gene. p21 protⁿ causes cell arrest.
* ATR activates chk-1 which phosphorylate cdc-25 phosphatase. phosphorylated cdc-25 phosphatase enter the cytosol and is not allowed to enter or, go back to the nucleus by an adaptor protⁿ. R/a 14-3-3θ.

Mutation in ATR & ATM gene causes Ataxia disease which is an inherited recessive disorder resulting in nervous and immune system defects and making the individual more susceptible for cancer development.