The Role of Tuberin in DNA Damage Repair During Cell Proliferation

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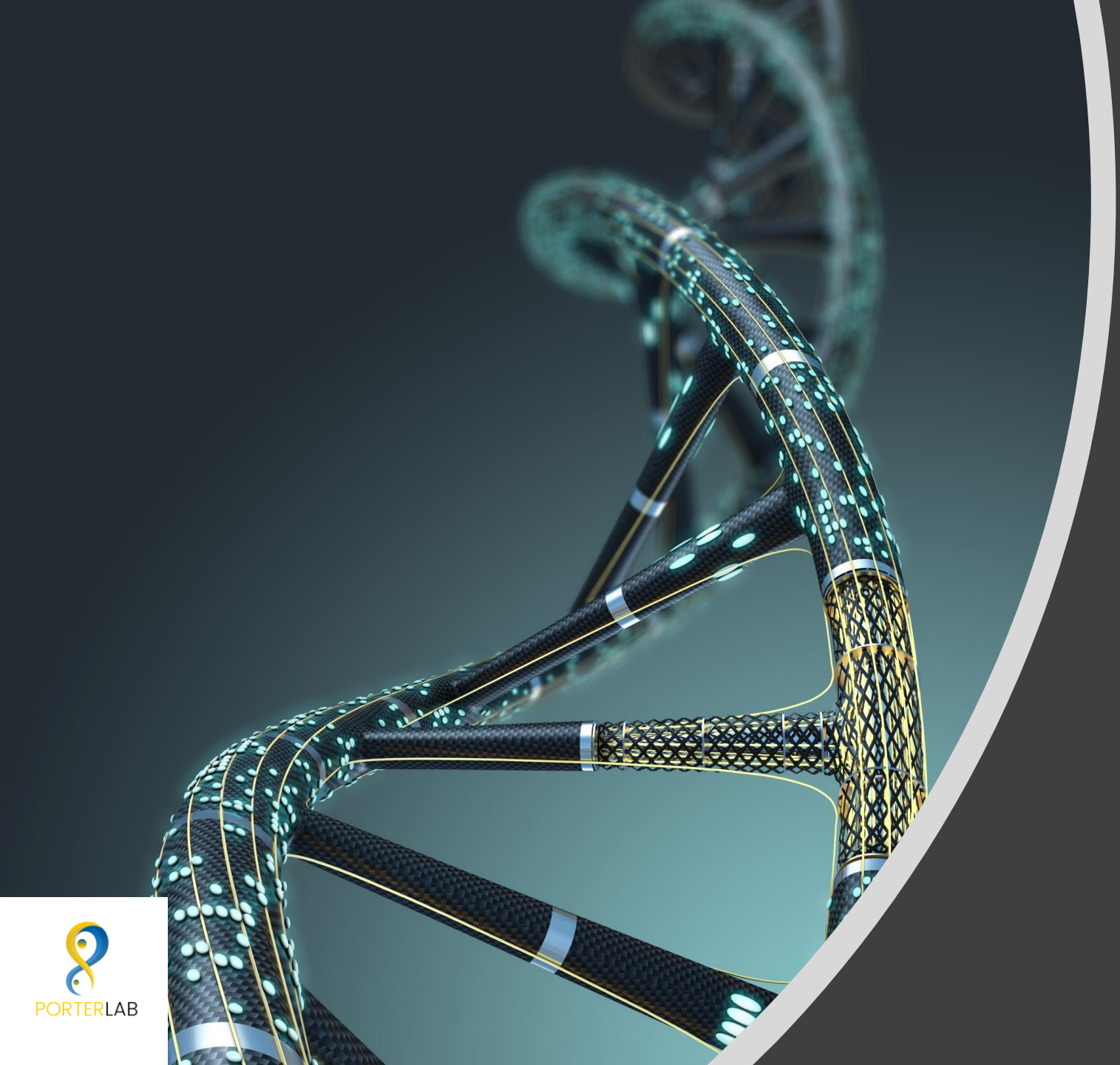

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Kadila Adili

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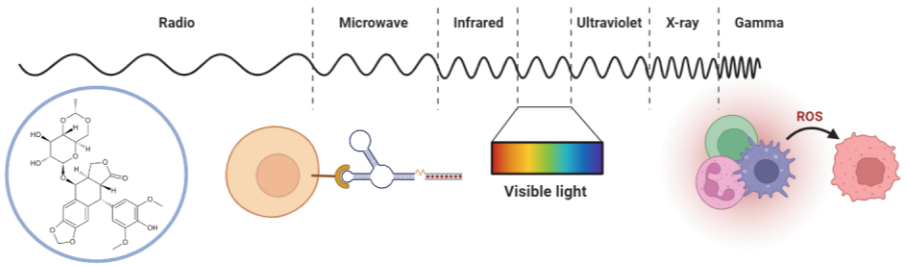
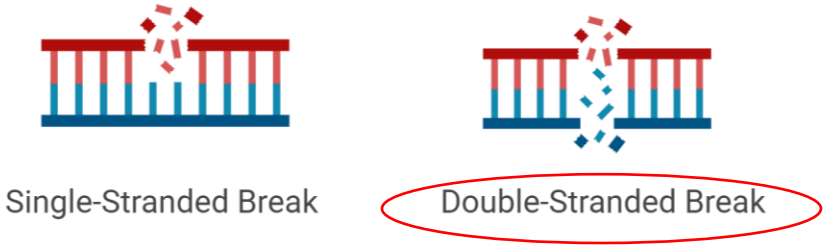
Why is DNA Damage Important?

Sources

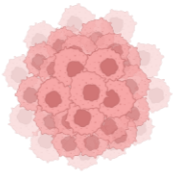




Single-Stranded Break

Double-Stranded Break

Effects



Cancer

Neurodegenerative Disease

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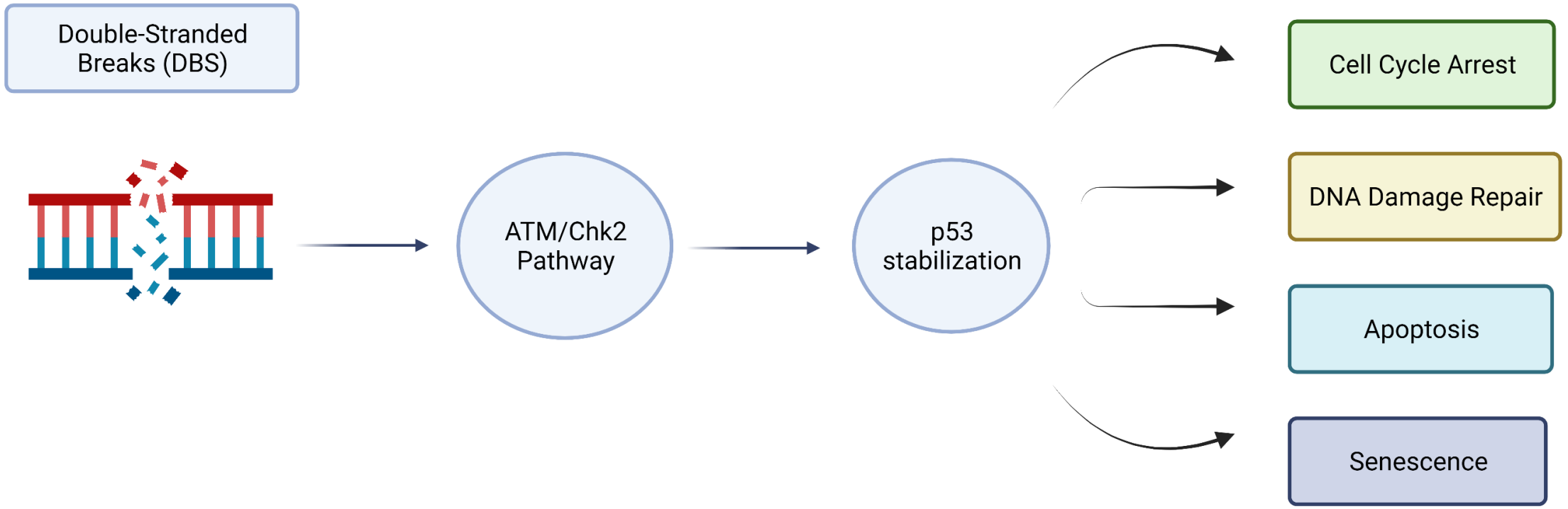
DNA Damage Response & p53



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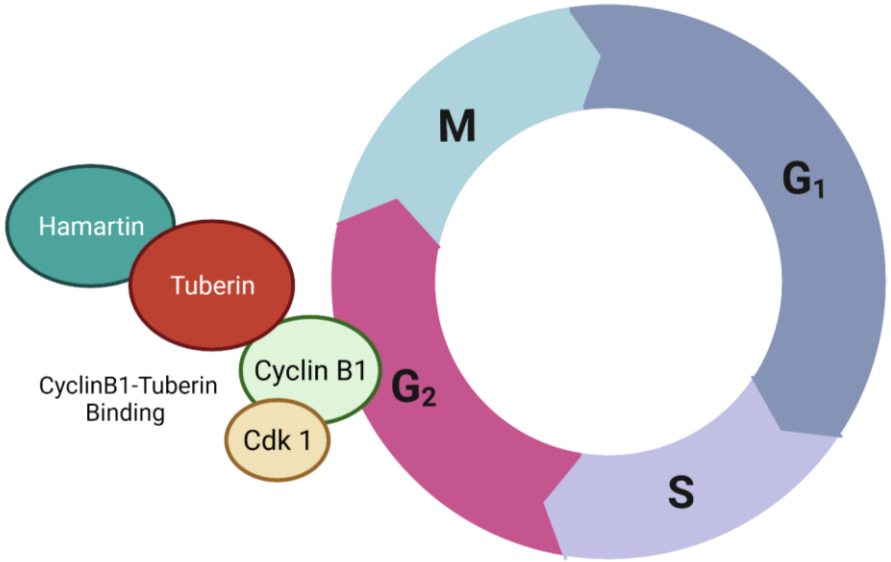
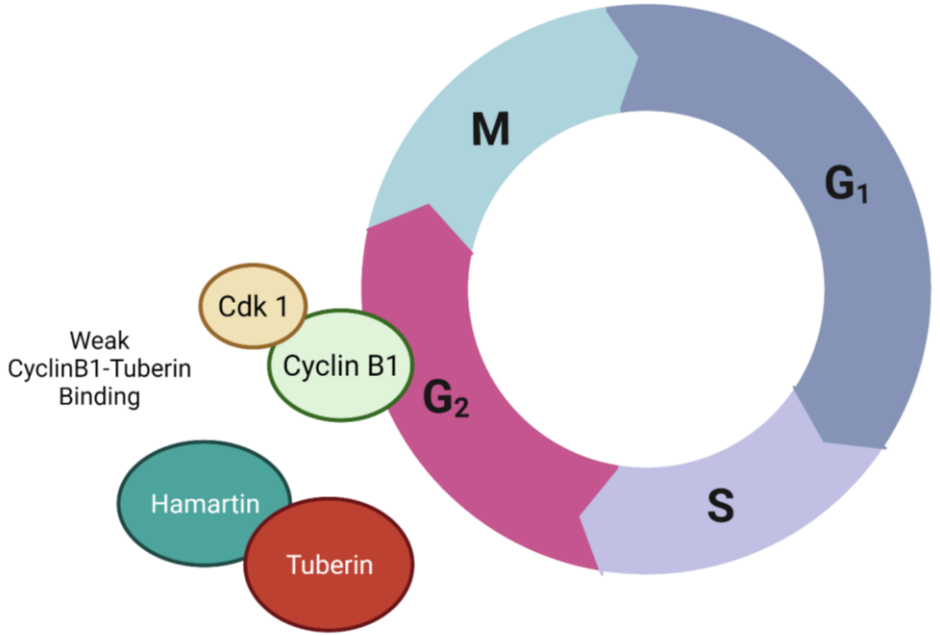
What Role Does Tuberin Play In The Cell Cycle?



High Nutrient Conditions: Mitotic Delay & Increase in Cell Size



Low Nutrient Conditions: Progression into Mitosis

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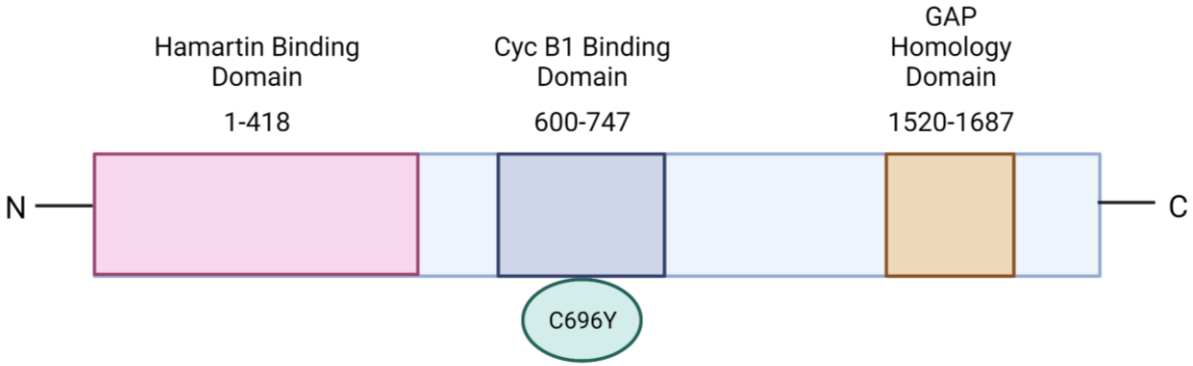
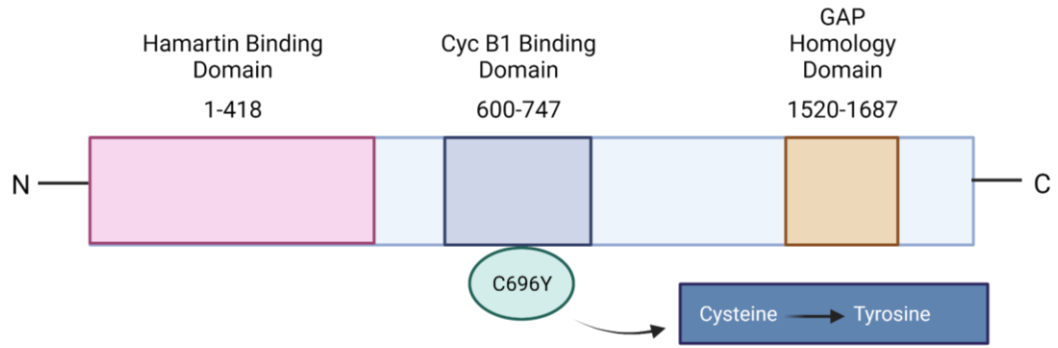
Tuberin Structure and Mutants

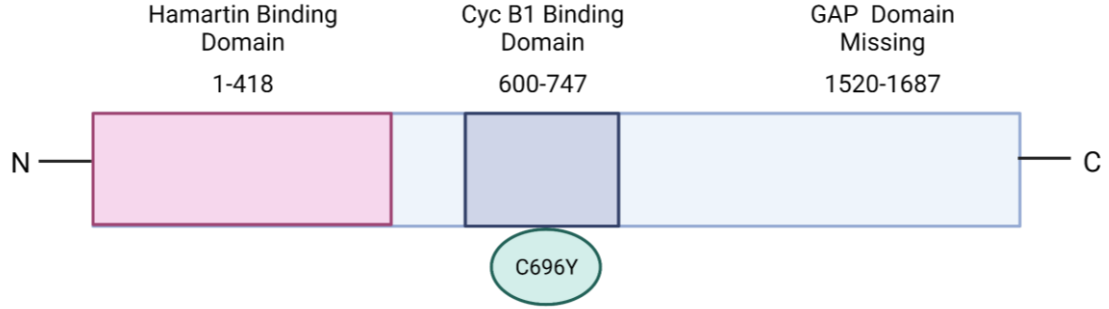
Tuberin (TSC2) Structure



TSC2-C696Y



TSC2ΔGAP



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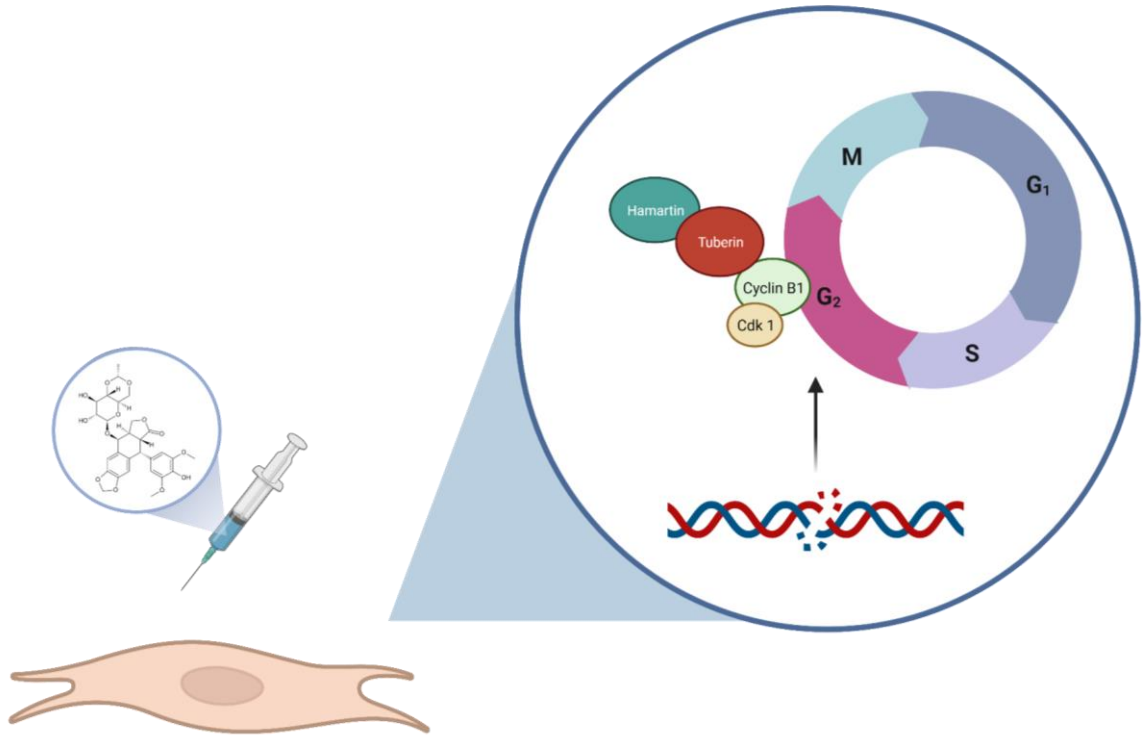
How does the Tuberin-Cyclin B1 complex play a role in DNA Repair?

Hypothesis: The Tuberin-Cyclin B1 complex plays a role in DNA damage repair through G2/M arrest.



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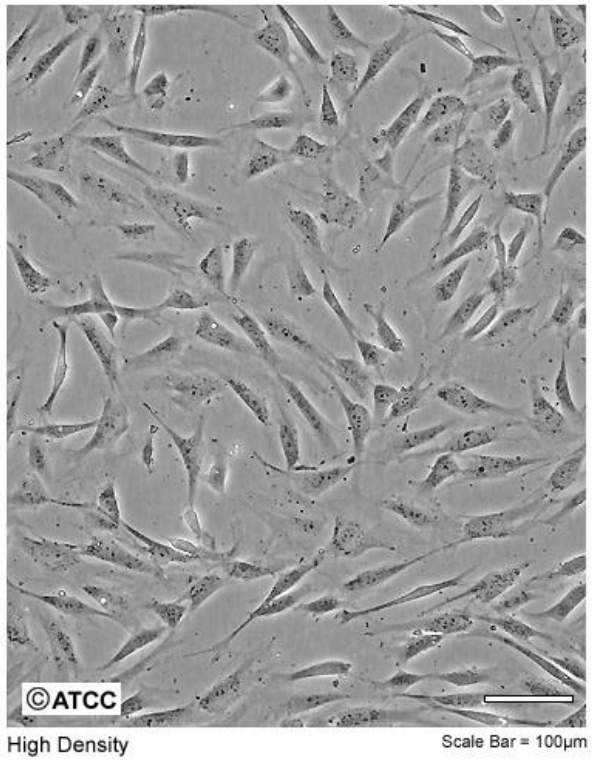
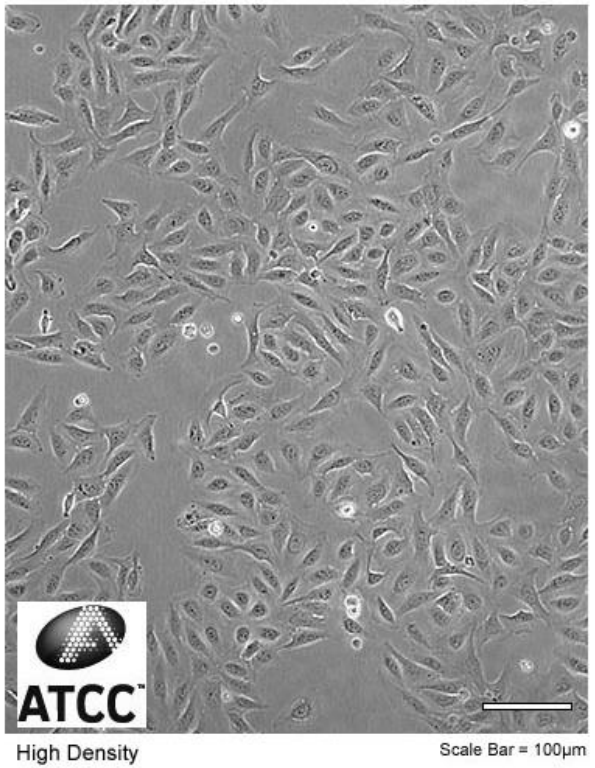
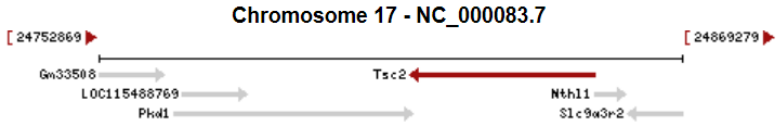
NIH/3T3 & U2OS Cell Line Rationale



NIH-3T3 Cells



U2OS Cells



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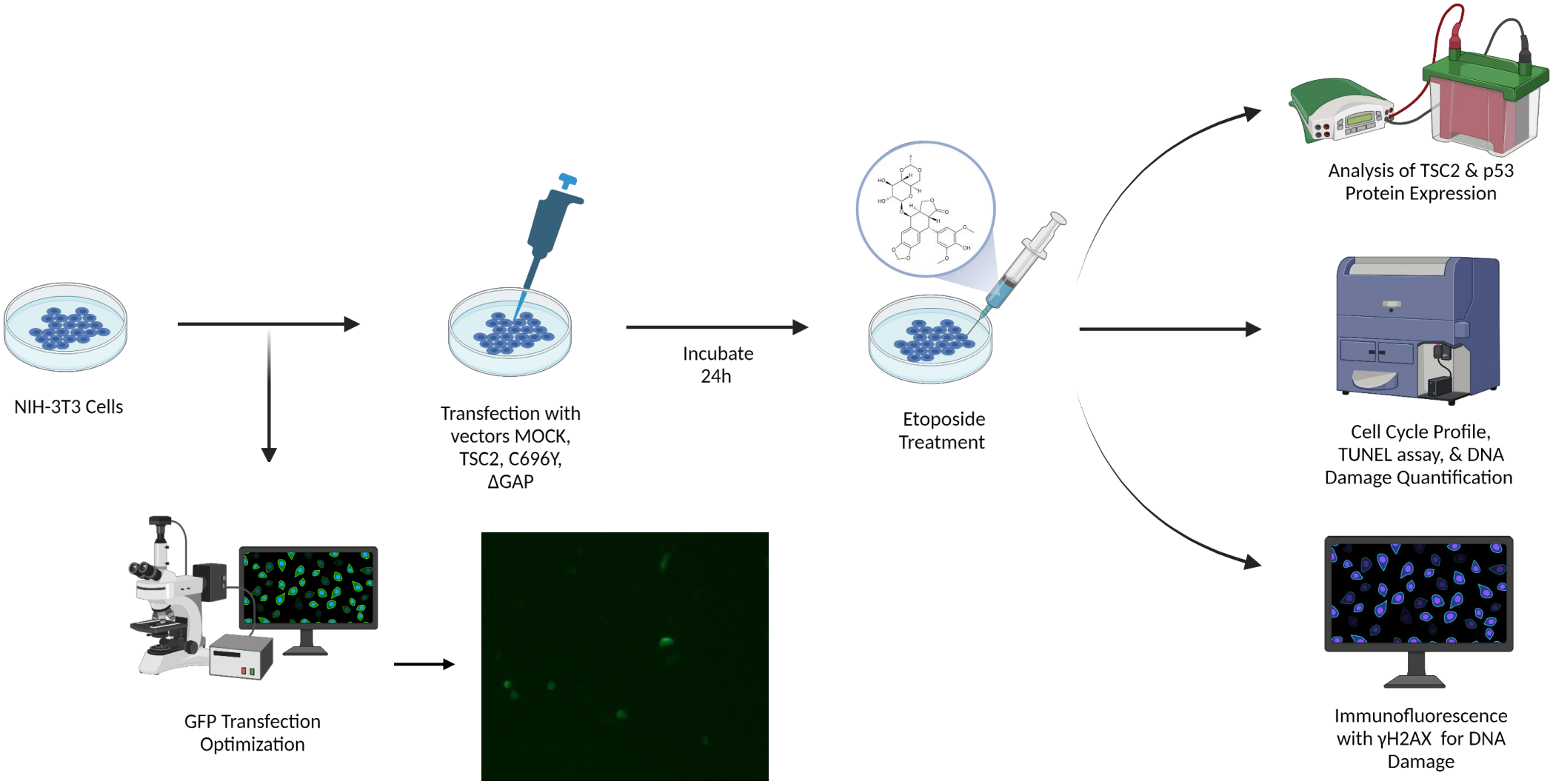
Experimental Design



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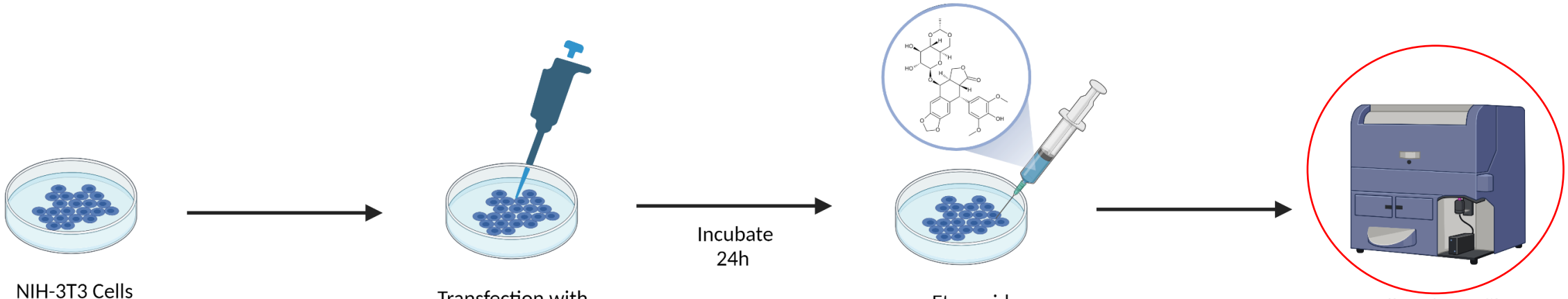
What Etoposide concentration arrests most cells in G2/M?

- **Objective 1**: Etoposide dose curve to obtain G2/M arrest in cell cycle



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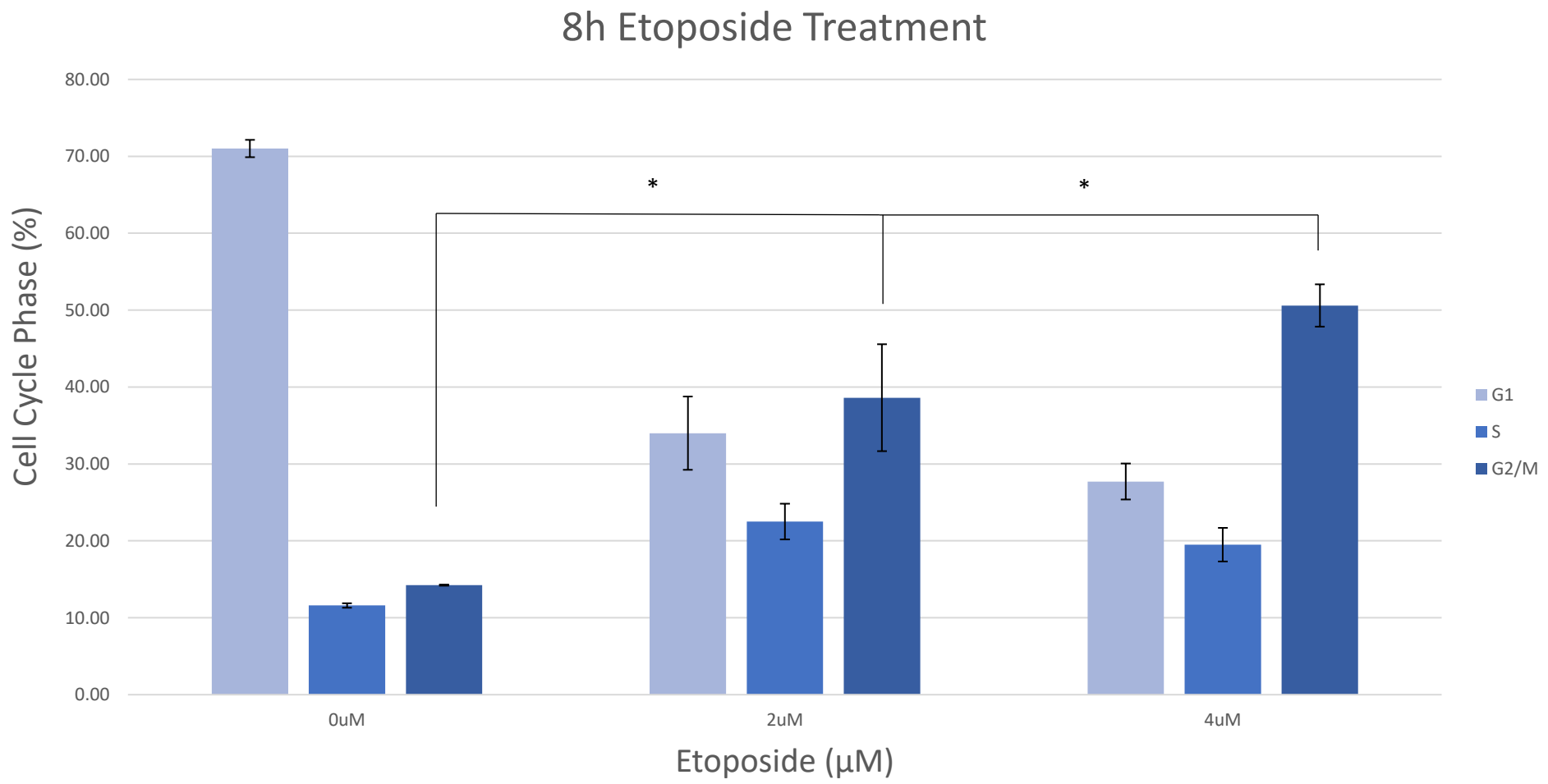

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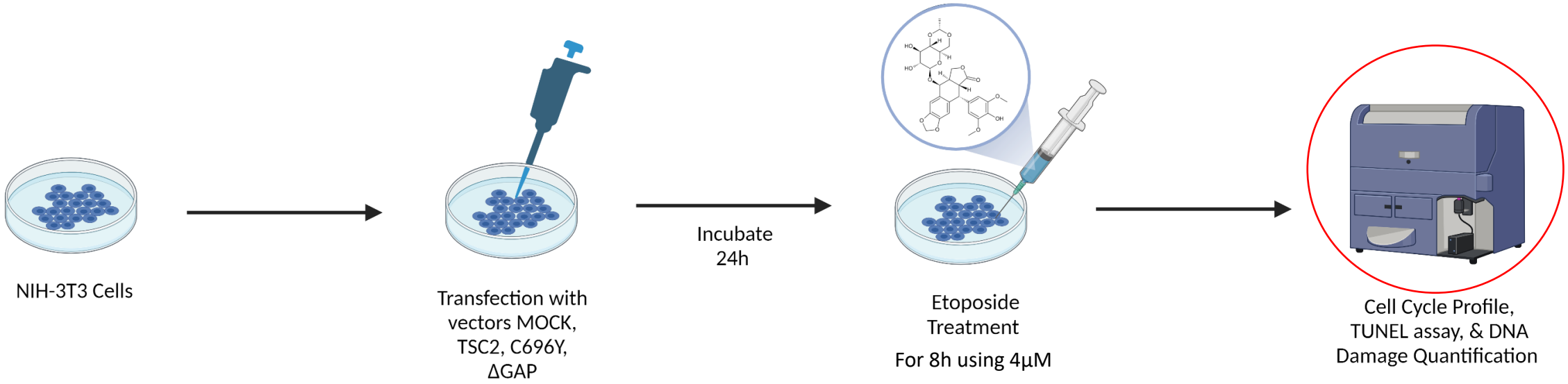
Percentage of Apoptotic Cells Significantly Greater In TSC2-C696Y Mutant

- **Objective 2**: Analyze apoptotic cell population using TUNEL Assay



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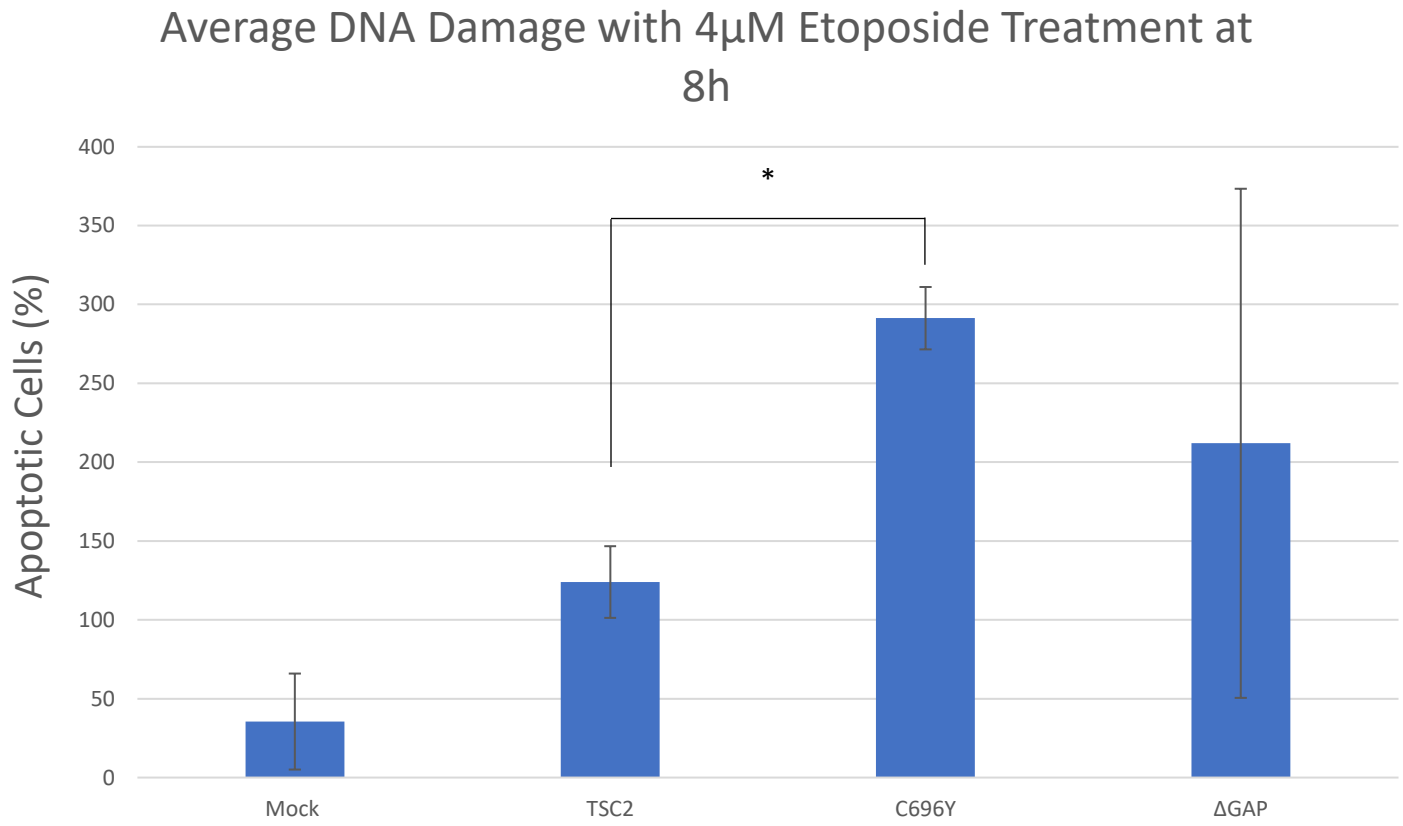

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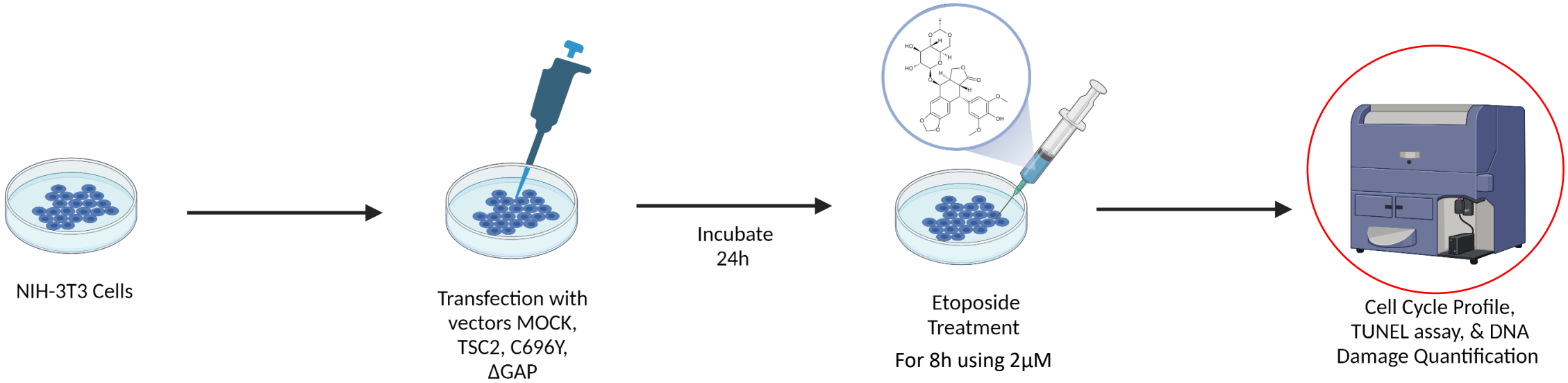
DNA Damage Quantification With γH2AX & Flow Cytometry

- **Objective 3**: Quantify DNA damage using γH2AX and flow cytometry



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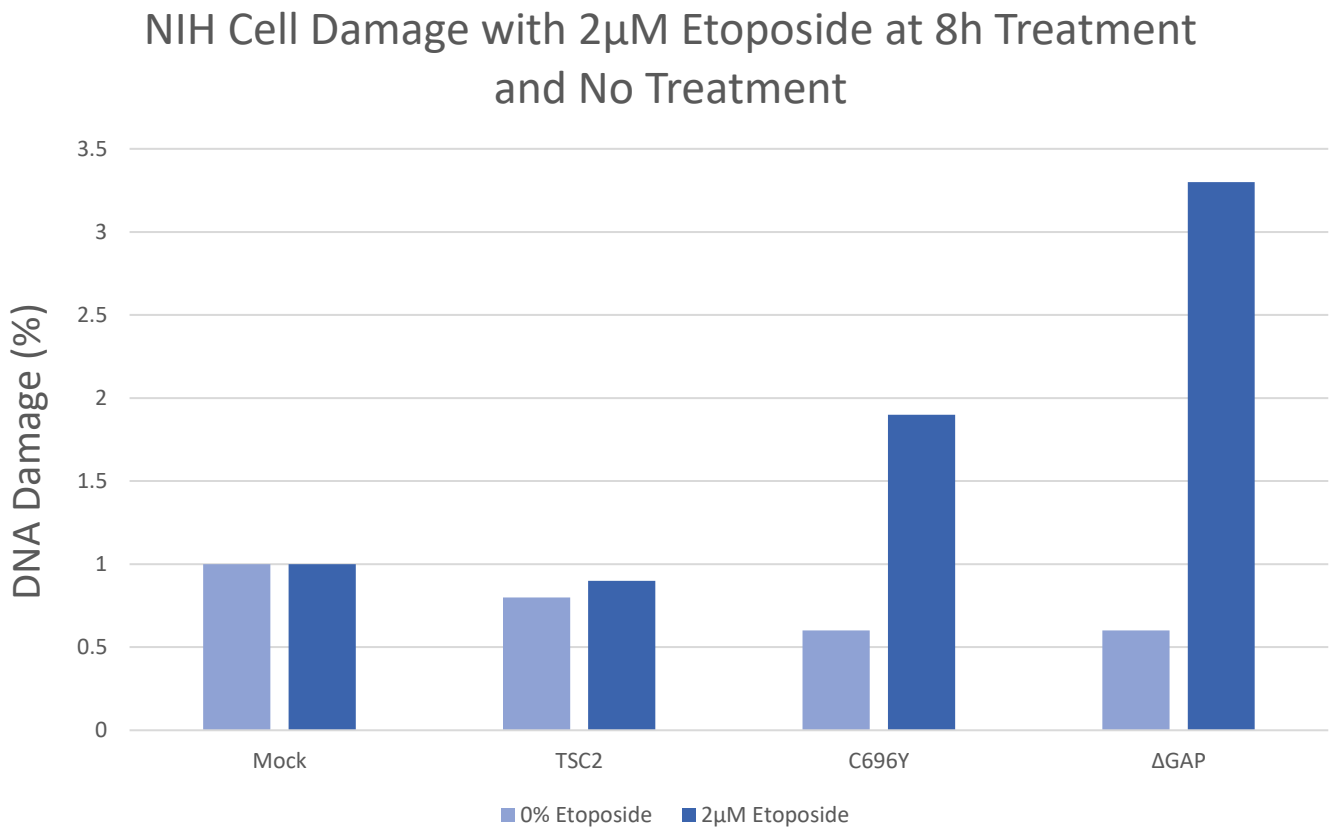

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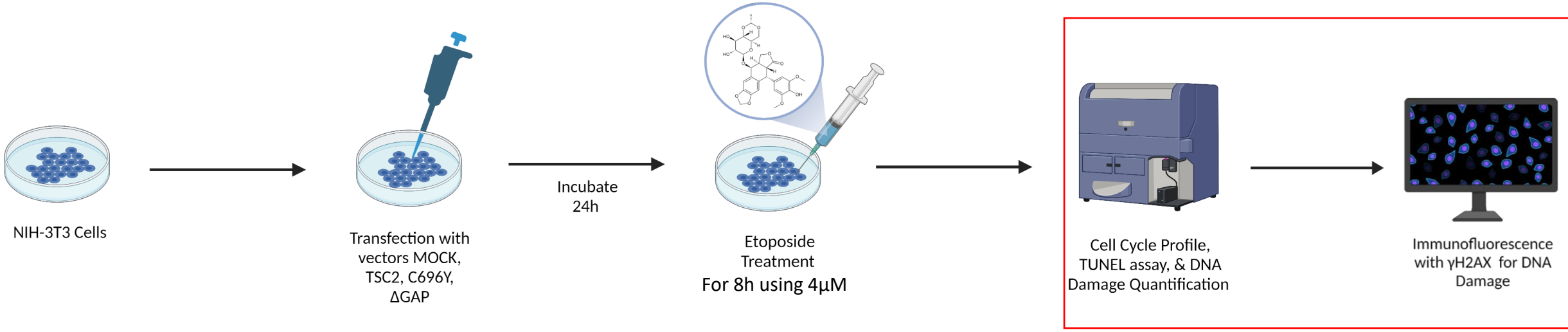
DNA Damage Quantification With γH2AX Immunofluorescence

- Objective 3: Quantify DNA damage using γH2AX and Immunofluorescence



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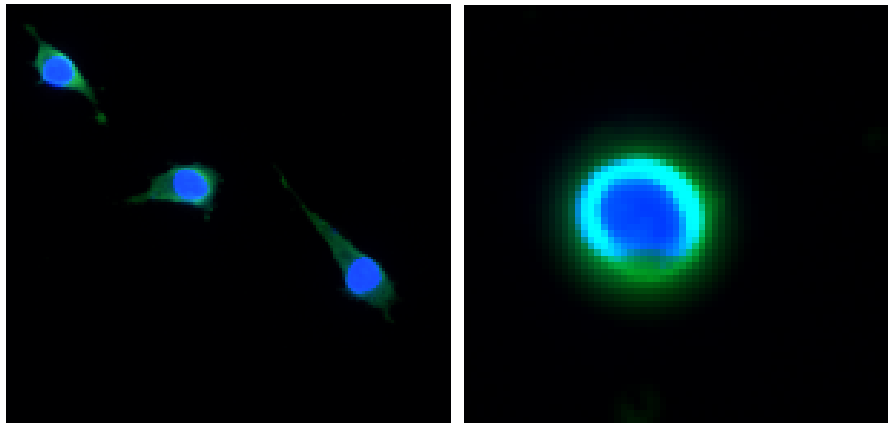

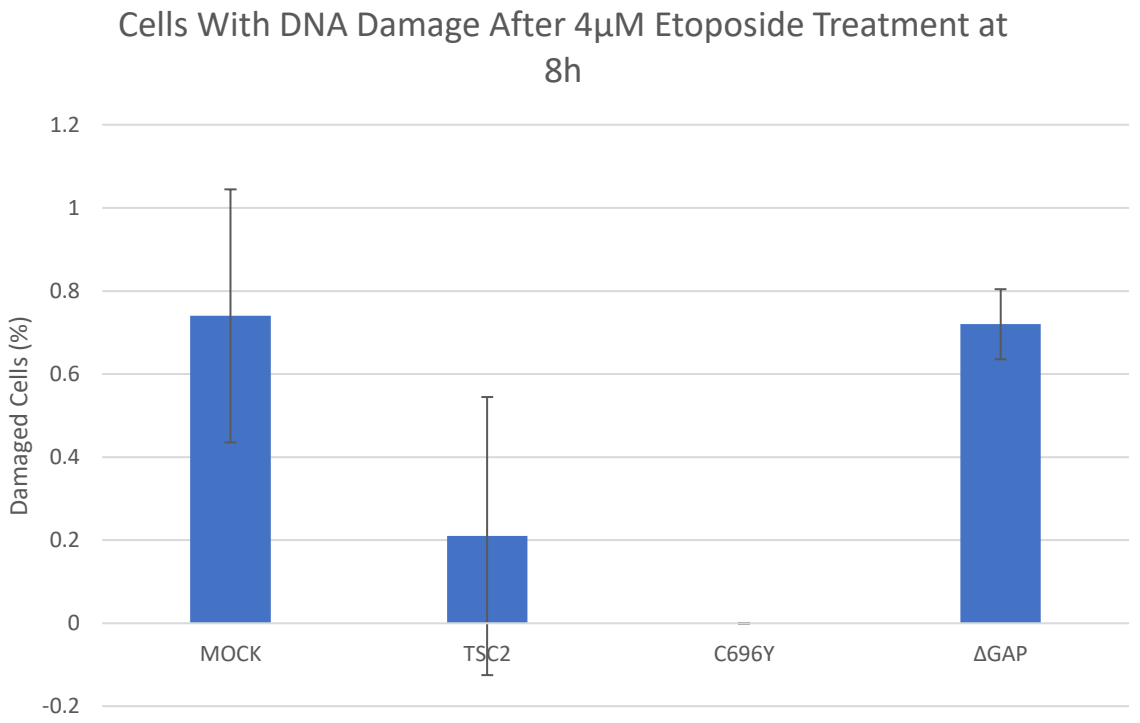

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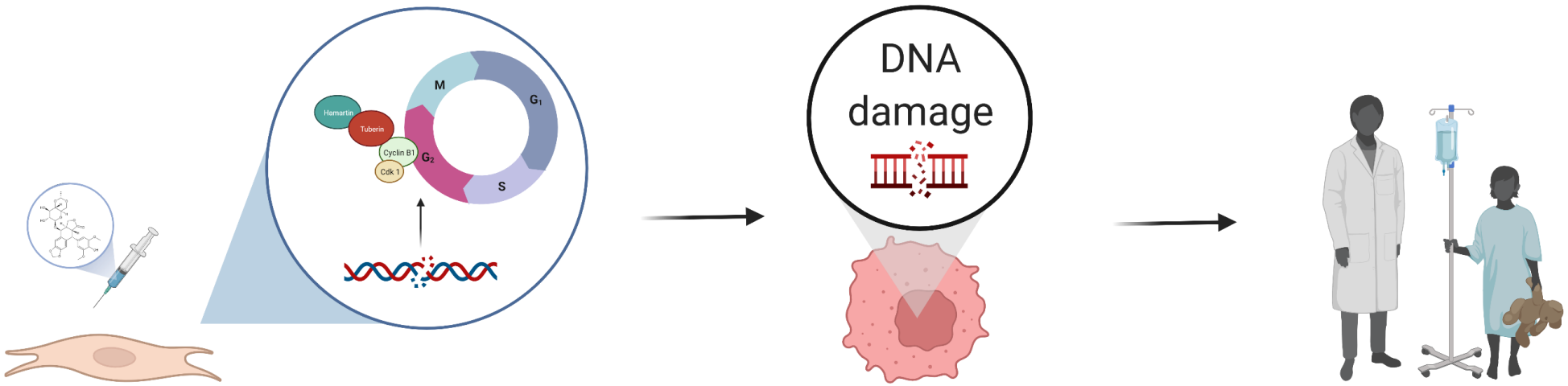
The Importance of Tuberin and DNA Damage



DNA Damage Research

Understanding DNA Damage induced carcinogenesis

Providing better outcomes for patients

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NSERC CRSNG

PEER MENTORING NETWORK
LAB AWAY FROM LAB

Acknowledgements

- Supervisors: Dr. Lisa Porter and Dr. Elizabeth Fidalgo da Silva
- Porter Lab Team Members
- Thank you for your support!