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Effects of Osmotic Stress on DNA and Cell Viability in a Desiccation-Sensitive Cell Line

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Cover Page Footnote

Brocker, Chad et al. "The role of hyperosmotic stress in inflammation and disease." *Biomolecular concepts* vol. 3,4 (2012): 345-364. doi:10.1515/bmc-2012-0001 Dietmar Kültz. "Osmotic Regulation of DNA Activity and the Cell Cycle." *Cell and Molecular Response to Stress*, Elsevier, 2 Sept. 2007, <https://www.sciencedirect.com/science/article/abs/pii/S1568125400800145>. Hoen, Laura et al. "Osmotic Stress Interferes with DNA Damage Response and H2AX Phosphorylation in Human Keratinocytes." *Cells* vol. 11,6 959. 11 Mar. 2022, doi:10.3390/cells11060959 Wallberg, Fredrik et al. "Analysis of Apoptosis and Necroptosis by Fluorescence-Activated Cell Sorting." *Cold Spring Harbor protocols* vol. 2016,4 pdb.prot087387. 1 Apr. 2016, doi:10.1101/pdb.prot087387 Work Supported by the Mentored Undergraduate Research and Creative Activities Grant.

Effects of Osmotic Stress on DNA and Cell Viability in a Desiccation-Sensitive Cell Line

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ABSTRACT

Kc167 is a widely used *Drosophila* cell line, known to be sensitive to the extreme water loss caused by desiccation. In order to characterize the effects of this desiccation-sensitivity on DNA and cell viability, a series of osmotic stressors of differing concentrations were introduced to the cell line. These cells were then imaged via the Cytation1 cell imaging machine using fluorescence microscopy. Specifically, cells were stained using the DAPI staining solution, a blue fluorescent DNA stain that binds strongly to A-T rich regions within the DNA, forming a fluorescent complex. As DAPI more readily enters the membrane and thereby stains dead cells, instances of apoptosis caused by osmotic stress on cells can be characterized by increasing intensity of fluorescence. Both sucrose and sodium chloride were used to simulate the water loss relevant to that of desiccation. This was done in concentrations of 100mM, 250mM, and 500mM for both sucrose and sodium chloride.

KEYWORDS: osmotic stress, Kc167, desiccation, DAPI

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