Anticancer drug screening using *invitro* Cell Proliferation assay

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Introduction

In this presentation cell proliferation methods and how they are related to screening for effective chemotherapy drugs will be reviewed. Cancer in its most basic form is the unchecked mass dividing of cells while normal apoptosis is not undertaken for various reasons, some of which that have yet to be discovered. By these means' tumors form that inhibit the functions of the organs it is residing in and the effected cells may metastasize and spread throughout the body. For this reason, chemotherapy drugs must be assessed through introduction into working strains of cultured cancer cells that are then screened for effectiveness through a process called cell proliferation assays.

Objective

The goal is to find the exact dosage for inhibiting the greatest number of Colorectal Cancer Cell (CRC) cells, strain HCT-116, while leaving other healthy cells unaffected as the methods are explained.

Methods

Several methods exist for determining the resulting levels of proliferation of cells after drug administration such as: Molecular Targeted Therapies (MTT) and (Water Soluble Tetrazolium) WST-1 that uses a tetrazolium salt reagent on the cells before introducing the drug in question and then a colorimetric assay is used to determine the quantity of living cells remaining through assessing which retain the dye that is

produced. Alamar BLUE is another experiment that uses redox reactions but substitutes the tetrazolium with resorufin, other options include Bromodeoxyuridine (BrdU) assay which analyzes the amount of a thymidine analog that is present post experiment after it has been absorbed by denatured DNA.

Results

Once cell counts have been gathered, drugs of varying concentrations have been administered, and the assays are performed to gather the number of cells that continue to proliferate, tables and graphs reflecting such information may be drawn to find the Growth Inhibitory dose of 50% (GI 50) of the cells.

Discussion

At the conclusion of these trials work will still need to be done to find how these drugs will be implemented in vivo. The next logical step is moving on to testing these therapies on animals to find strengths and weaknesses in live models.

Conclusion

Through the course of testing 4 different chemotherapy drugs on HCT-116, MTT and other such cell proliferation assays are utilized in finding the correct dosages to elicit the desired response of inhibiting the growth of CRC cells. The process will begin from the first splitting of cell stock to acquire workable amounts of HCT-116, culturing this working stock, and passaging it as the quantity of cells become larger. The cell proliferation methods will be outlined along with the reasoning and theory behind them to include the materials utilized. The results will be discussed while also explaining how the results are to be properly evaluated. Finally, graphed analysis resulting in either GI 50 curves may be constructed to better tabulate what the varying concentrations effects resulted in. From here we continue to narrow our search to more finite concentrations that will yield better results in killing only the exact number of cells desired.

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