Capstone project proposal

1. What is the problem you want to solve?

Cancer is a highly adaptable disease. This feature enables it to overcome numerous therapies and become resistant. Micro RNA(miRNA) are endogenous small non coding RNAs that play a role in regulating gene expression. They are involved in the drug resistance in a number of cancers. Targeting miRNA is one of the emerging treatment options in cancer therapy.

Furthermore, cancer involves dysregulation of a number of genes that in turn contributes to drug resistance. Inhibiting or downregulating the expression of genes is another therapeutic option that is actively studied using small interfering RNA (siRNA). The current project in the GEO database involved the use of miRNA and siRNA as therapeutic option to affect a number of genes involved in multiple cancers. Analysis of the expression data will provide information about the genes that are significantly affected using the above therapeutic approaches.

2. Who is your client and why do they care about this problem? In other words, what will your client DO or DECIDE based on your analysis that they wouldn’t have otherwise?

The clients can be university or pharmaceutical companies. This analysis will help us understand the set of genes that are differentially affected using the above treatment. This result can then be utilized to predict the functional changes that eventually may occur as a result of the treatment. This study provides a bioinformatics basis for the effects of the above treatment in various cancers.

3. What data are you going to use for this? How will you acquire this data?

Plan to use GEO database accession [Series GSE66498](http://www.ncbi.nlm.nih.gov/geo/query/acc.cgi?acc=GSE66498). Differentially expressed genes after miRNA or siRNA transfection in human cancer cell lines (II).

4. In brief, outline your approach to solving this problem (knowing that this might change later).

Current plan is to use GEO query package for working on this project