

十一、研究計畫中英文摘要：請就本計畫要點作一概述，並依本計畫性質自訂關鍵詞。

(一) 計畫中文摘要。(五百字以內)

(二) 計畫英文摘要。(五百字以內)

Keywords: mircoRNA, microRNA target, oncogene, tumor suppressor gene, protein-protein interaction, siRNA

The main purpose of this proposal is to establish the possibility that microRNA (miRNA) could play the role of an oncogene and tumor suppressor gene. By integrating heterogeneous types of data, that is miRNA targets (TarBase), miRNA and mRNA expression level data (NCI-60), cancer type microarray data (ArrayExpress, SMD), miRNA target prediction tools (miRanda, RNAHybrid), gene annotation database (Gene Ontology) and literatures data (PubMed), to investigate the relationship between miRNA and cancer.

Furthermore, in this proposal we will integrate miRNA, miRNA targets, siRNA, siRNA targets, protein-protein interactions and the OMIM data to reconstruct the miRNA and siRNA disease related pathways. Also, a miRNA gene cluster prediction tool will be developed to predict more cancer related miRNA genes.

Year one and year two results will be deployed as an web service.

On the other hand, the PI and co-PI of this proposal will work together in order to valid the cancer related miRNA bioinformatics predictions by in vivo experiments. In this part, we will focus on four major goals, to be completed in two years time, which are outlined below:

1. To examine the expression profiles of miRNAs with those of their target genes' mRNAs *in vivo*.
2. To validate the correlation between miRNA and its target gene via a reverse genetic tool, anti-miRNA inhibitor.
3. To examine the predicted target sites of cancer-related miRNAs.
4. To examine the mechanisms by which the predicted miRNAs effect on carcinogenesis in vivo, that is to examine the ability of miRNA to inhibit cancer cells growth, anchorage independence, apoptosis, and understand the underlying molecular mechanism.