

## Research Projects as Principal Investigator

1. Cell-specific expression of TGF-beta 1 and MCP-1 in the liver of patients with biliary atresia and its value in differential diagnosis from neonatal hepatitis. Chang Gung Medical Research Proposal, CMRP1007 (04/01/2000 - 03/31/2001).
2. PTEN expression and gene delivery studies in hepatoma. National Science Council Proposal, NSC89-2320-B-182A-044 (08/01/2000 - 07/31/2001).
3. Analysis of TSG101 expression in various types of thyroid carcinomas and benign thyroid lesions. Chang Gung Medical Research Proposal, CMRP1122 (04/01/2001 - 03/31/2002).
4. Analysis of human TSG101 expression by using teratomas and carcinosarcomas as the benign and malignant tissue models. National Science Council Proposal, NSC90-2314-B-182A-072 (08/01/2001 - 07/31/2002).
5. Analysis of SARS Susceptibility by HLA Typing. Chang Gung Medical Research Proposal, CMRPG82013S (07/01/2003 - 06/30/2004) ◦
6. Exploring saponins biosynthesis in the *Bupleurum Kaol* using EST analysis. Chang Gung Medical Research Proposal, CMRPG32067 (09/01/2003 - 8/31/2004) ◦
7. Characterization of the Role of DLK1 in Liver Fibrosis Caused by Biliary Atresia. National Science Council Proposal, NSC92-2321-B-182A-001 (08/01/2003 - 07/31/2004).
8. Functional analysis of DLK1 on hepatic stellate cells. National Science Council Proposal, NSC93-2320-B-182A-009 (08/01/2004 - 07/31/2005).
9. Cytology technician training project for Papanicolaou smear. Contract Project with Bureau of Health Promotion, Department of Health, Taiwan, PMRPG840021 (05/01/2005 - 12/31/2005).
10. Identification and characterization of Delta-like (Dlk1/Pref-1) in liver fibrosis caused by biliary atresia. Chang Gung Medical Research Proposal, CMRPG840381 (08/01/2005 - 01/31/2007).
11. Dlk1/Pref-1 study on liver regeneration. National Science Council Proposal, NSC94-2320-B-182A-004 (08/01/2005 - 10/31/2006).
12. Proteomic analysis for the role of Dlk1/Pref-1 on hepatocytes and hepatic stellate cells. National Science Council Proposal, NSC95-2320-B-182A-009 (08/01/2006 - 07/31/2007).
13. Cytology technician training project for Papanicolaou smear. Contract Project with Bureau of Health Promotion, Department of Health, Taiwan, (01/01/2007 - 12/31/2007).
14. Study on the role of DLK1 on neurogenic cell differentiation. National Science Council Proposal, NSC96-2320-B-182A-005-MY2 (08/01/2007 - 07/31/2009).
15. Establishment of the centralized tissue bank for medical research at Chang Gung Memorial Hospital-Kaohsiung Medical Center. Chang Gung Medical Research Proposal, CMRPG870461 (07/01/2008 - 02/29/2012).
16. Functional study for Dlk1/Pref-1 on tumor angiogenesis of neuroblastoma. National Science Council Proposal, NSC98-2320-B-182-023-MY3 (08/01/2009 - 07/31/2012).
17. Comparison of EGFR and KRAS mutation status on primary and metastatic sites of

- adenocarcinoma of lung. Chang Gung Medical Research Proposal, CMRPG891541 (02/01/2011 - 01/31/2012).
18. Establishment of highly sensitive EGFR mutation detection method and detection of EGFR mutation in pleural effusion of lung adenocarcinoma. Chang Gung Medical Research Proposal, CMRPG8A1041 (02/01/2012 - 01/31/2014).
  19. Establishment of human bio-bank and maintenance of tissue bank core facility. Chang Gung Laboratory Research Proposal, CLRPG8B0031 (03/01/2012 - 08/31/2015).
  20. Study on the role of Dlk1/Pref-1 in endometrial and ovarian adenocarcinomas. National Science Council Proposal, NSC101-2320-B-182-009 (08/01/2012 - 07/31/2013).
  21. Functional analysis of DLK1/Pref-1 expression on epithelial-mesenchymal transition and cancer stemness in ovarian cancer. National Science Council Proposal, NSC102-2320-B-182-011 (08/01/2013 - 07/31/2014).
  22. The diagnostic and therapeutic potential of cell differentiation-related gene DLK1/Pref-1 in ovarian cancer, Ministry of Science and Technology Proposal, MOST 103-2320-B-182-005-MY3 (08/01/2014 - 07/31/2017).
  23. Functional study of exosomes in oral squamous cell carcinomas. Chang Gung Medical Research Proposal, CMRPG8D0641 (10/01/2014 - 09/30/2016).
  24. Maintenance of human biobank and tissue bank core facility (1/3). Chang Gung Laboratory Research Proposal, CLRPG8E0161 (09/01/2015 - 11/30/2016).
  25. Clinical Validation of GB HER2 RealEx PCR--multi-center study in Taiwan. Chang Gung Clinical Trial Proposal, XMRPG8F0491 (08/30/2016 - 08/31/2017)
  26. Maintenance of human biobank and tissue bank core facility (2/3 & 3/3). Chang Gung Laboratory Research Proposal, CLRPG8F1701 and CLRPG8F1702 (12/01/2016 - 11/30/2018).
  27. Correlation between environmental emerging pollutants and colon cancer. Chang Gung-Cheng Shiu Conjoint Medical Research Proposal, CMRPG8G0031 (01/01/2017 - 12/31/2017).
  28. Targeting DLK1-CD44 Signaling axis for resistant ovarian cancer. Ministry of Science and Technology Proposal, MOST 106-2320-B-182-019 (08/01/2017 - 07/31/2018).
  29. Study on the differential expression of exosomal miRNA between HPV-positive and HPV-negative head and neck squamous cell carcinoma. Chang Gung Medical Research Proposal, CMRPG8G1271 (01/01/2018 - 12/31/2018).
  30. Evaluation of DLK1 as a prognostic and chemoresistance biomarker of ovarian serous carcinomas. Ministry of Science and Technology Proposal, MOST 107-2320-B-182-037-MY3 (08/01/2018 - 07/31/2021).
  31. Evaluation of the scoring agreement of immunohistochemistry for Ventana SP263 PD-L1 antibody on non-small cell lung cancer, head and neck squamous cell cancer and urothelial carcinoma, and the comparison of Ventana SP263 PD-L1 antibody and DAKO PharmDx 22C3 PD-L1 antibody on non-small cell lung cancer - International IO Ring Study. Chang Gung Clinical Trial Proposal, XMRPG8H0421 (08/22/2018 - 06/30/2019).

32. Delineating the role of Delta-like non-canonical Notch ligand 1 (DLK1) in liver fibrosis. Chang Gung-Zhongshan Conjoint Medical Research Proposal, CMRPG8I0281 (01/01/2019 - 127/31/2019).
33. Maintenance of Human Biobank and Tissue Bank Core Facility in Kaohsiung (1/3). Chang Gung Laboratory Research Proposal, CLRPG8I0031 (02/01/2019 - 01/31/2020).