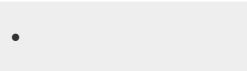




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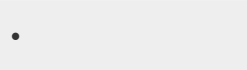
A Functional Genomic Study of Some Bu-Yi Chinese Herbs Pharmacologic Effect on Protection and Repair of Tissue Stem/Progenitor during Cancer Therapy



CCMP94-RD-044

9406 ~ 9506

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Human tissue stem/progenitor cell Bu-Chi Chinese medicine Tissue repair and regeneration Hematopoietic/Mesenchymal stem cell Functional genomic study

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ABSTRACT Traditional Chinese herbs have been widely prescribed for human diseases in clinic. They also exhibit great potential in treatment of many major illnesses. For an example, Chinese drugs have been found significant effect on the recovery rate of chemotherapeutically treated cancer patients' health. To date, however, the physical-pharmacological understanding of their effects is very limited. Recent studies on stem cells have shown that many adult tissue stem cells are not only capable of maintaining and renewing the catabolized tissue cells in organs but also responsible for our body tissue injury repairs. Most stem cells are normally situated in quiescent state and activated only when stressed by their normal environmental changes. Our body tissue stem cells are therefore very important in protection and maintenance of tissue health, particularly when they were stressed and damaged by physical and chemical environmental pressures. The objective of this proposal study is to investigate the molecular pharmacologic effect of the traditional chinese Bu-Yi medicine on protecting and repairing of cancer therapeutically damaged normal tissue stem/progenitor cells by means of pharmacogenomic analytical approaches, and at mean time, to initiate the molecular data collection for establishing a human tissue stem cell pharmacologic informatics of Chinese drugs. We have previously established several human tissue stem/progenitor cell primary cultures for molecular studies on their lineage specific differentiation potentials. In vitro cell lineage specific differentiation culture studies on hematopoietic stem/ progenitor cells (peripheral blood, umbilical cord blood, and fetal liver) and on mesenchymal stem/progenitor cells derived from various tissues (bone marrow, peripheral blood, fat, scalp, foreskin, and amniotic membrane tissue) have been examining.

- We have also initiated a series of test on some selected chinese drugs such as *Astragalus membranaceus* Bge., *Panax quinqueflum* L., *Panax notoginseng* F.H.Chen, *Bupleurum chinense* DC., *Coix lachryma-jobi* L. and *Rhodiola kirilowii*., and analyzing their influences on hematopoietic erythroid maturation, mesenchymal tissue cell differentiations and proliferation for determining their tissue protection and repairing functions. In this study, we have pursued a completely study focusing on investigating the molecular pharmacology of other Bu-Yi prescriptions which are well known their components in promoting human body physiological performance by the neutralizing and tonifying tissue organ cells. We found both prescriptions and herbs exhibit distinct regulatory effects on proliferation and differentiation of hematopoietic and mesenchymal stem cells. We further focusing on study the pharmagenomic mechanism of effective Bu-Yi prescriptions by comparison and substractional analyses of gene expression and protein profile changes under irradiation conditon. We observed expression of several tumor suppression genes were significantly elevated, while multiple oncogene and tumor antigen genes were repressed when adult mesenchymal stem cells were pretreated with Bu-Yi prescription upon irradiation damage. The drug effect on protective effects of Bu-Yi prescription in the irradiation damaged mesenchymal stem/progenitor cells were further qualitatively evaluated by cytokine protein array. In addition to multiple factors were stimulated by irradiation stress, more chemokines (such as NAP2 and GCP2) involved in inflammatory were secreted by adult mesenchymal stem cells when pretreated with Bu-Yi prescription. Take together; these results indicate Bu-Yi prescription may exert protective effects by inhibition of cellular transformation and modulation of immune responses. Upon completions of this st