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Short Communication

Cancer Arises as a Consequence of Wound not Healing Properly. Thus, Perfection of Wound Healing Must be the Most Appropriate Strategy to Win the War on Cancer

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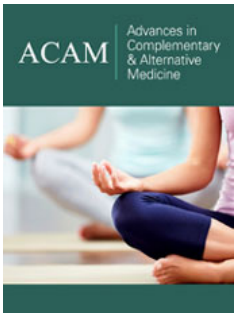

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Wound Healing is a Process to Involve the Proliferation and The Perfect Terminal Differentiation (TD) of Progenitor Stem Cells (PSCs)

Wound healing and the evolution of cancer are closely related to involve PSCs as the critical elements. Wound healing is a process to involve the breakdown of membrane bound phospholipid to release arachidonic acid (AA) for the synthesis of prostaglandins (PGs), which are differentiation inducers (DIs) critical for the perfect healing of wound [1-3]. Wound happening to a healthy person does not pose a threat of cancer development, because healthy person has an intact chemo-surveillance capability to ensure the perfect wound healing, and to deny unnecessary buildup of PSCs to evolve into cancer stems cells (CSCs), and then to progress to much faster growing cancer. PSCs and CSCs are very much alike on cell features and biological missions. Their methylation enzymes (MEs) are abnormal due to association with telomerase [4-6]. They are protected by ATP binding cassette drug pumps to resist toxic chemicals [7-9]. Their biological missions are to meet the needs of the organ including the repair of the damages. Thus, they are very responsive to differentiation inducing factors. It is very likely that CSCs are originated from PSCs, which requires only a single hit to silence TET-1 enzyme, a process well within the reach of PSCs equipped with very active abnormal MEs. TET-1 enzyme is frequently found silenced in cancer cells [10-12]. Thus, PSCs are still able to carry out differentiation programs, relying on TET-1 enzyme to accomplish DNA hypomethylation, whereas the differentiation of CSCs and their progenies is completely blocked. The breakdown of membrane bound phospholipid is a necessary evil to facilitate membrane hyperpermeability for the release of DIs and DHIs from inside of PSCs, which function as a brake to prevent the proliferation of PSCs, to allow the buildup of PSCs to heal the wound. PGs produced in response to wound are very effective DIs to promote TD of PSCs for the completion of wound healing [2,3]. Obviously, destabilization of abnormal MEs is a critical process for wound healing, which comes naturally. Natural metabolites involved in wound healing are very valuable for the eradication of PSCs and CSCs essential to the success of wound healing and cancer therapy [13,14]. TD induced by DIs alone is often incomplete due to damages caused by DIs to interrupt differentiation process [2,3]. In the presence of differentiation helper inducers (DHIs), which are inhibitors of the ternary MEs, damages caused by DIs alone can be avoid reach a perfect completion of TD. Healthy people maintain a steady level of DIs and DHIs as chemo-surveillance agents to prevent the proliferation of cells with abnormal MEs [15]. With enough DIs and DHIs and newly synthesized PGs, perfection of wound healing can always be anticipated to take place to healthy people. But if wound happens to a person whose chemo-surveillance capability has been compromised due to immunological disorders or long-term exposure to toxic chemicals or carcinogens, then wound may not be healed properly. Immunological disorders or long-term exposure to toxic chemicals trigger

immunological responses in addition to the biological responses above mentioned to result in cachexia symptom. A manifestation of cachexia symptom is the excessive excretion of low molecular weight metabolites resulting in the collapse of chemo-surveillance. Without the participation of chemo-surveillance, wound may not be healed properly. The proliferation of PSCs keeps on beyond what is needed for healing the wound, and to evolve into CSCs and then to cancer. This is exactly the process that leads to myelodysplastic syndrome (MDS) and acute myeloid leukemia.

Perfection of Wound Healing as the Most Appropriate Strategy to Win the War on Cancer

Cancer arises because of wound not healing properly due to the collapse of chemo-surveillance. Supplements of chemicals to perfect wound healing are naturally the most appropriate strategy to put cancer away. AA and PGs are the metabolites most critical for wound healing. These metabolites are DIs to target on abnormal MEs. AA, pregnenolone and phenylacetylglutamine are the three metabolites most critical for chemo-surveillance. AA is a DI and pregnenolone is a DHI to target on abnormal MEs, and phenylacetylglutamine is an anti-cachexia chemical. These are metabolites come naturally to deal with wound healing and to prevent cancer evolution. Abnormal MEs stand out as the most critical issue of wound and cancer. Wound healing comes naturally. The medications used in the wound healing are primarily antibiotics to prevent infection. We rely on the nature to heal the wound. We should also rely on the nature to take care of cancer. Indeed, cancer therapies achieved by destabilization of abnormal MEs through DIs and DHIs are in general excellent [16,17]. All-trans retinoic acid, a DI, is the standard of care for acute promyelocytic leukemia. Imatinib mesylate, a DHI, is the standard of care for chronic myeloid leukemia and gist. Phenylbutyrate, another DHI of our discovery, is very effective on untreatable malignant brain tumors, and CDA-2, a perfect cancer drug with DIs, DHIs, and anti-cachexia chemicals is the best drug for MDS [18,19]. The therapeutic endpoint of destabilization of abnormal MEs is TD of cancer cells to turn cancer cells to become non-replicating cells and functional cells. The tumor mass may persist. We may have to come up a different endpoint for the evaluation of therapeutic efficacy of therapy based on destabilization of abnormal methylation enzymes. Disappearance of circulation cancer cells, or more specifically CSCs, is definitely a more appropriate endpoint for the assessment of the therapeutic efficacy of destabilization of abnormal MEs. Such endpoint is the same endpoint for the assessment of therapeutic efficacy of hematological cancers.

The use of cytotoxic drugs and radiation for the therapy of cancer is inappropriate, which creates more wound to aggravate the already bad situation of cancer arising from wound not healing properly. Their inability to put out CSCs and the contribution to destroy chemo-surveillance lay the ground for inevitable recurrence and fatality. That is why cancer mortalities remain at old time high worldwide despite the input of all resources in the past to combat cancer. Cell differentiation agent (CDA) formulations can remedy the insufficiencies of destruction strategies. Afterall, destruction strategies have the merit as most effective to kill cancer cells and to eliminate tumor mass. The combination therapy utilizing destruction approach to eliminate most sensitive cancer cells and the CDA formulations to target on CSCs and to restore chemo-surveillance may be the winning combination to put cancer away and to win the war on cancer.

Cancer is caused by multiple factors. Factors such as membrane hyperpermeability, cachexia, chemo-surveillance, blockade of differentiation, activation of oncogenes, and inactivation of suppressor genes are all contribute significantly to the evolution of cancer. A perfect solution for cancer must be the one that can resolve all issues involved in the evolution of cancer. CDA formulations are the perfect drugs for cancer prevention and therapy [20]. The active components of CDA formulations are DIs and DHIs to target on abnormal MEs, which are the creator's favored prescriptions for wound healing and chemo-surveillance against cancer. By pushing replicating PSCs and cancer cells out of cell cycle to undergo TD, CDA formulations can also put to rest the issues of oncogenes and suppressor genes. Afterall, oncogenes and suppressor genes are cell cycle regulatory genes, they have important roles to play when cells are in cell cycle replicating. But they have no roles to play if cells are no longer replicating. Induction of differentiation is an easy solution to otherwise very difficult problem of gene abnormalities. CDA formulations are perfect to prevent recurrence attributable to CSCs and to restore chemo-surveillance capability, the most feared adverse effects of destruction therapy.

References

1. Ho ATV, Palla AR, Blake MR, Yual ND, Wang YX, et al. (2017) Prostaglandin E2 is essential for efficacious skeletal muscle stem cell function, augmenting regeneration and strength. Proc Natl Acad Sci USA 114(26): 6675-6684.
2. Liau MC, Kim JH, Fruehauf JP (2020) In pursuance of differentiation inducers to combat cancer via targeting of abnormal methylation enzymes. J Cancer Tumor Intl 10(2): 39-47.
3. Liau MC, Kim JH, Fruehauf JP (2021) Arachidonic acid and its metabolites as surveillance differentiation inducers to protect healthy people from becoming cancer patients. Clin Pharmacol Toxicol Res 4(1): 7-10.
4. Liau MC, Chang CF, Becker FF (1979) Alteration of S-adenosylmethionine synthetases during chemical hepatocarcinogenesis and in resulting carcinomas. Cancer Res 39 (6 Pt 1): 2113-2119.
5. Liau MC, Chang CF, Giovanella BC (1980) Demonstration of an altered S-adenosylmethionine synthetase in human malignant tumors xenografted into athymic nude mice. J Natl Cancer Inst 64(5): 1071-1075.
6. Liau MC, Zhuang P, Chiou GCY (2010) Identification of the tumor factor of abnormal methylation enzymes as the catalytic subunit of telomerase. Clin Oncol Cancer Res 7: 86-96.
7. Zhou S, Schuetz JD, Bunting KD, Colapietro AM, Sampath J, et al. (2001) The ABC transporter Bcrp1/$ABCG_2$ is expressed in a wide variety of stem cells and is a molecular determinant of the side population phenotype. Nat Med 7(9): 1028-1034.
8. Moitra K, Lou H, Dean M (2011) Multidrug efflux pumps and cancer stem cells: Insight into multidrug resistance and therapeutic development. Clin Pharmacol Ther 89(4): 491-502.

9. Frame FM, Maitland NJ (2011) Cancer stem cells, model of study and implication of therapy resistance mechanisms. Adv Exp Med Biol 720: 105-118.

10. Haffner MC, Chaux A, Meeker AK, Asopi DM, Jonathan G, et al. (2011) Global 5-hydroxymethylcytosine content is frequently reduced in tissue stem/progenitor cell compartments and in human cancers. Oncotarget 2(8): 627-637.

11. Kudo Y, Tateishi K, Yamamoto K, Yamamoto S, Yoshinari A, et al. (2012) Loss of 5-hydroxymethylcytosine is accompanied with malignant cellular transformation. Cancer Sci 103(4): 670-676.

12. Fics GM, Gibben JG (2014) Loss of 5-hydroxymethylcytosine in cancer: cause or consequence? Genomics 104(5): 352-357.

13. Liau MC, Fruehauf JP (2019) Restoration of the chemo-surveillance capability is essential for the success of chemotherapy and radiotherapy to put cancer away. Adv Complement Alt Med 5(4): ACAM. 000617.2019.

14. Liau MC, Fruehauf JP (2019) The winner of the contest to eradicate cancer stem cells wins the contest of cancer therapies: The winner is cell differentiation agent formulations. Adv Complement Alt Med 5(4): ACAM. 000620.2019.

15. Liau MC, Szopa M, Burzynski B, Burzynski SR (1987) Chemo-surveillance: A novel concept of the natural defense mechanism against cancer. Drug Exptl Clin Res 13(Suppl 1): 71-76.

16. Liau MC, Kim JH, Fruehauf JP (2019) Destabilization of abnormal methylation enzymes: nature's way to eradicate cancer stem cells. Online J Complement Alt Med 2(5): 1-6.

17. Liau MC, Kim JH, Fruehauf JP (2020) Destabilization of abnormal methylation enzymes to combat cancer: The nature's choice to win the war on cancer. Lambert Academic Publishing 978-620-2-66889-7.

18. Ma J (2007) Differentiation therapy of malignant tumor and leukemia. CSCO Treaties on the Education of Clinical Oncology, pp. 480-486.

19. Liau MC, Fruehauf JP (2015) Destabilization of abnormal methylation enzymes as a critical mechanism for CDA-2 to reverse MDS progression. The First International Forum of Myelodysplastic Syndrome in Tai Zhou, Jiangsu, China, pp. 31-35.

20. Liiau MC, Fruehauf PA, Zheng ZH, Fruehauf JP (2019) Development of synthetic cell differentiation agent formulations for the prevention and therapy of cancer via targeting of cancer stem cells. Cancer Stud Ther J 4(1): 1-15.