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Cancer and heart disease: Novel insights aimed at diagnosis and drug therapy

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Abstract

Personalized genetics approaches are presented targeting tumor suppressor gene nonsense mutations by read-through with such drugs as Ataluren (PTC124^{R}) resulting in amino acid substitution to create full length proteins. Emphasis is on preserving protein structure-function relations. Examples will be provided from the Catalogue of Somatic Mutations in Cancer and for inherited cases of cancer that demonstrate the utility of this novel therapy.

In addition, an elegant new model system that aids prediction of suitable therapeutic treatments focused on therapy-resistant and dormant cancer cells is presented. Cancer cell *pro-survival* reaction to adverse tumor microenvironment is explored in the context of myocardial reaction to unfavorable physiologic conditions. Many of the protective and indeed non-protective (tumor suppressor) reactive mechanisms in both cancer and heart tissue challenged with an adverse environment follow similar and predictable patterns. From examining myocardial proteomics studies targets such as Mipu1, TESK1, zinc finger proteins ZNF307 and Zf36, and Parstatin are revealed as novel factors that require to be examined in cancer. The model may also be examined in reverse to discover novel cardioprotective biomarkers. In addition, this analysis can provide important directions in the development of biomarkers for cancer and heart disease. In particular, the notion of constructing a panel of biomarkers to aid sensitive diagnosis of heart diseases in the primary health care setting from cancer-related biomarkers such as, for example, enolase, chromogranin, PSA, growth factors and angiogenic factors and microRNAs is presented as a potentially feasible strategy.

Biography

John Loudon completed his Ph.D. at the age of 29 from the University of Sydney. His postdoctoral studies were performed at Sydney University, Australia, Roswell Park Cancer Institute, Buffalo, NY and Tsukuba University, Tsukuba, Japan. He holds a clinical specialization in oral pathology and is a graduate fellow of the American Academy of Oral and Maxillofacial Pathology. He is presently active in clinical practice and has published over a wide range of subjects from basic research to clinical studies.