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Pharmacogenomics of cancer therapeutics: Molecular structure, drug development, and inter-patient variability

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Cancer biomarkers are expressed as a result of the development and progression of the disease. These biomarkers are most relevant for identifying patients who are likely to benefit from a given treatment (right drug for the right patient). This approach should be utilized in cancer drug development as well as measuring patient's response to therapy. Some examples of these targeted therapy and their associated design/discovery are discussed: Trastuzumab (Herceptin®) for treatment of breast cancer with HER2 overexpression; the tyrosine kinase inhibitors imatinib (Gleevec®) and nilotinib (Tasigna®), for treatment of BCR-ABL gene expression of Ph⁺ chronic myeloid leukaemia; vemurefenib (Zelboraf) in cases of melanoma with BRAF mutation; panitumumab (Vectibix®) and cetuximab (Erbix®) therapy of K-Ras mutation-negative (wild-type), epidermal growth factor receptor (EGFR)-expressing, metastatic colorectal cancer. Pharmacogenetic data related to cancer therapy are also presented. Risks of developing severe, life-threatening toxicities of thiopurine (hematopoietic/ myelosuppression, TPMT*3A/*3C variants); the topoisomerase I inhibitor irinotecan (severe/fatal neutropenia, UGT1A1*28 allele); and the BCR-ABL tyrosine kinase inhibitor Nilotinib (hyperbilirubinemia, UGT1A1*28 allele) are shown.

Biography

Salah M Blaih, PhD, RPh, FRSC is Professor of Chemistry and Biochemistry, Kent State University, USA. He received PhD in Pharmacy from The Ohio State University. He has teaching, research and authoring in pharmacy and chemistry for more than 25 years. He is World-wide invited speaker on quality of medicines/ compendia standards, pharmacogenomics, and medication safety. He is a Fellow of The Royal Society of Chemistry, two-time President of The American Chemical Society-Penn Ohio Section, board-certified pharmacist. He is a member of ACCP, AAPS, Rho Chi Pharmacy Honor Society. His biography has been included in Who's Who in the World and Who's Who in America.

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