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In This Issue

Editor's Summaries of the Articles Published in This Issue of Precision Medicine Communications

Editorial Staff

In this issue, Rafiq et al, investigated noncancerous FDA-approved drugs for repurposing through molecular docking studies in Breast Cancer patients after their target cystic fibrosis transmembrane conductance regulator protein (CFTR) detection in breast cancer patients. Konain and colleagues evaluate the anticancer potential of commonly used angiotensin receptor blocker (ARB) telmisartan and validate it through molecular techniques, Bangash and friends investigate whether the efficacy and adverse effects of fluvoxamine are associated with polymorphism in the *CYP2D6* gene in patients with depression; Mubarak and colleagues reviewed studies aimed at investigating resistance to Carbamazepine in epilepsy patients influenced by the polymorphism of genes encoding metabolic enzymes and drug transporters, while Riaz and Chen provide general information about Type 2diabetes mellitus, treatment challenges, and pharmacogenetic aspects of metformin pharmacotherapy in type 2 diabetes mellitus.

Exploring the Potential of Drug Repurposing: Detection of Cystic Fibrosis Transmembrane Conductance Regulator as a Biomarker in Breast Cancer Patients

Despite the advancements in cancer treatment and the benefits of personalized medicine, breast cancer (BC) remains a significant health concern. Rafiq and colleagues investigated noncancerous FDA-approved drugs for repurposing, through molecular docking studies in BC, after their target cystic fibrosis transmembrane conductance regulator protein (CFTR) detection in BC. They used a drug repurposing approach to identify the target protein CFTR and drugs that target CFTR. MOE (molecular operating environment) was used to analyze the interaction between CFTR and its targeting drugs. They found that glyburide and tezacaftor were the top antagonist and agonists, respectively. Their study is a preliminary step towards in-vitro and in-vivo experiments on repurposing CFTR-targeting drugs in BC. Glyburide may inhibit CFTR's estrogen production, while tezacaftor can enhance CFTR action to overcome tumor aggressiveness.

Biomarker-Guided Drug Repurposing and Molecular Validation of Angiotensin-2 Receptor Type-1 in Brain Tumor

Glioma, the most frequent and malignant brain tumor, is one of the most lethal forms of cancer. Konaian and colleagues evaluates the anticancer potential of commonly used angiotensin receptor blocker (ARB) telmisartan. *In vitro* growth inhibitory assays revealed that telmisartan at a dose of 45±0.06 µM was able to inhibit 50% of the cell population in malignant glioma U87 cell lines. The PCR results show that *AGTR1* expression in the untreated sample was high, as evidenced by $2^{-\Delta\Delta Ct}$ values (342.4, 138.5, 1467.3) for sample IK148-Glioblastma multiform (GBM), IK163-low grade glioma (LGG), and IK231-Medulloblastoma

(MDB), respectively. Based on the findings of their study, it can be concluded that telmisartan exhibits successful inhibitory effects against *AGTR1* expression in glioma cell lines.

Genetic Polymorphism in CYP2D6 and its Association with the Safety and Efficacy of Fluvoxamine in Patients with Major Depressive Disorder

The non-responder phenomenon is often associated with the use of fluvoxamine, a selective serotonin reuptake inhibitor when used for treating major depressive disorder (MDD). Bangash and colleagues investigated whether the efficacy and adverse effects of fluvoxamine are associated with polymorphism in the *CYP2D6* gene in patients with major depressive disorder. Their results showed that there was no statistically significant association between the efficacy or safety of fluvoxamine and our investigated single nucleotide polymorphism (SNP). This study demonstrates that the efficacy of fluvoxamine in patients with depressive disorder may not be predicted on the basis of *CYP2D6 1846G>A (rs3892097)* genetic marker.

Carbamazepine Resistance in Epileptic Patients & Its Association with Genetic Polymorphism

Carbamazepine (CBZ) is one of the most widely prescribed antiepileptic drugs. It is first-line therapy to treat partial tonic-clonic seizures, trigeminal, glossopharyngeal neuralgias, and bipolar disorder. Muabarak and colleagues reviewed a collection of studies aimed at investigating resistance to CBZ in epilepsy patients influenced by the polymorphism of genes encoding metabolic enzymes and drug transporters. They suggested that pharmacogenetic intervention is likely to improve treatment strategies and pave the way toward personalized medicine for epileptic patients.

Role of Genetic Polymorphisms in the Efficacy and Adverse Effects of Metformin in the Treatment of Type 2 Diabetes Mellitus

A clinical diagnosis of diabetes mellitus type 2 (T2DM) may include hyperglycemia, reduced insulin production, and increased insulin resistance. Conventional treatments aim to reduce the severity of disease symptoms, but they are unable to reverse disease progression or cure it. Metformin is an anti-diabetic medication for lowering hyperglycemic conditions that can be used effectively as monotherapy or in combination with other oral hypoglycemic agents. Riaz and Chen reviewed several studies that investigated the association between gene polymorphism and altered therapeutic response to metformin. This review provides general information about T2DM, treatment challenges, and pharmacogenetic aspects of metformin.

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