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Data security

The promise of personalized medicine is tempered by concerns about the security of pharmacogenomics data. In Reischl and co-workers' EELS paper (pp 225–233), they describe GENOMatch, Schering AG's answer to data protection. The underlying principles of GENOMatch is to improve integration of pharmacogenomics data in clinical trials while satisfying public concern about personal information. The system triple-masks patient identification to secure data and genetic samples, and reinforces the separation of responsibilities within and between institutions. GENOMatch can operate over the Internet and feed data back to the clinician or patients as needed. The system meets all legislative requirements and can be modified as laws or needs change.

Suppressing successfully

Since the emergence of HIV/AIDS, more than 20 drugs have been developed to treat this viral infection. Rodríguez-Nóvoa and co-workers (pp 234–245) examine patient response to antiretrovirals and how the virus is successfully suppressed in some cases but not in others. As with other drugs, polymorphisms of the CYP 450 may be the cause of inefficient drug metabolism and ultimately other reactions to treatment such as liver problems, high cholesterol, pancreatic disorders and lower plasma levels. There are several instances of polymorphism influence on disease progression but no definitive answer yet. As the death toll increases from this devastating virus, there is an urgency to increase the efficacy of these drugs and drug cocktails.

Alzheimer's improvement

Recent studies suggest that the insulin-sensitizing drug rosiglitazone may be useful in treating some cases of Alzheimer's disease. Risner *et al*. (pp 246–254) found that for mild-to-moderate patients, the efficacy of rosiglitazone varied depending on whether they carried the *APOE ε4* allele. Non-carriers of the allele improved in cognitive and functional measures of the disease after 24 weeks of treatment at a high dose. However, the drug had no statistically significant effect on the overall population, and *APOE ε4* carriers showed no improvement with rosiglitazone. The findings further implicate cerebral glucose metabolism in the development of Alzheimer's disease, and could potentially lead to treatment based on pharmacogenetic testing.

Babies on pot

Some women continue marijuana usage even after becoming aware they are pregnant. Wang *et al*. (pp 255–264) investigated the effects of cannabis exposure on the brain *in utero* and found altered mRNA expression levels in the endogenous opioid system. Affected midgestational fetuses had increased mu and decreased kappa receptor mRNA expression in components of the limbic system. Given the system's influence on emotional regulation, the findings are consistent with longitudinal studies that have shown emotional (as well as behavioral and motor) problems in children exposed to marijuana prenatally.

Cutaneous reactions

Carbamazepine and other antiepileptic drugs sometimes cause disabling or fatal adverse reactions in skin. Lonjou and co-workers (pp 265–268) tested for an association between the HLA-B*1502 allele and carbamazepine-induced Stevens-Johnson Syndrome and toxic epidermal necrolysis. In European patients, the allele was only present in those of Asian origin, ruling the allele out as a marker for European populations. These results contradict an earlier study in Han Chinese patients that suggested a universal association between HLA-B*1502 and cutaneous reactions. The authors believe HLA-B, or other closely related genes, still may be the cause of the association. These findings highlight the importance of ethnicity in pharmacogenetic clinical trials.

Blocking cancer

An emerging option for cancer treatment combines chemotherapeutics with drugs that disrupt tumor cell activity. Anfosso *et al*. (pp 269–278) present evidence that artemisinin (ARS) or its derivatives could control tumor growth by blocking angiogenesis. ARSs are used to treat malaria and have no major side effects. The authors measured the effectiveness of ARSs in inhibiting vasculature growth for 60 cancer lines, and compared the results to mRNA expression levels of 89 angiogenesis-related genes. mRNA expression patterns predicted cancer cell response to six ARSs at borderline statistical significance or better. The authors suggest ARSs halt some types of tumor growth in long-term cancer treatment and prevention strategies by acting on multiple targets.

Neurotoxic but calming

Haloperidol (HAL) is used in the treatment of psychosis but can have some serious side effects. Repetitive, involuntary, purposeless movements are commonly seen. Wei and co-workers (pp 279–288) demonstrate that a pro-apoptotic effect connected to the protein Bcl-XS accounts for one-fifth of HAL's cytotoxicity. HAL selectively increases proapoptotic Bcl-XS expression *in vitro* in preneuronal PC12 cells. Also, the $\sigma 2$ receptor – not the expected dopamine D_2 receptor – was found to be the primary mediator of apoptosis due to HAL intake. The authors believe that the σ and dopamine D_2 receptor systems are both involved in adverse reactions related to HAL usage.