Cholinergic systems in brain development and disruption by neurotoxicants: nicotine, environmental tobacco smoke, organophosphates
Where do we go from here?

The multiple and critical roles of acetylcholine as a trophic factor controlling the development of the brain from its primordial origins, through the final stages of plasticity and the programming of synaptic activity, mean that drugs or chemicals that target cholinergic neurotransmission represented a large and varied source of neurobehavioral anomalies. In the cases of maternal or adolescent smoking, or organo-phosphate insecticides, these exposures likely comprise a major proportion of the human population. However, it is a mistake to suppose that all compounds exhibiting cholinergic activity act only through that mechanism, and CPF provides a major example where other processes need to be taken into account. Establishing the underlying mechanisms, and hence safety thresholds, for these compounds must therefore represent a major focus of future work, but therein lies a serious problem: the uncovering of unexpected, alternative mechanisms that are particular to the immature organism will require new screening methods that emphasize unique attributes of developing systems.