I2 Bad Nature, Bad Nurture, and Testimony at Murder Trials

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After attending this presentation, attendees will have an understanding of how a person's nature (genetic make-up) and nurture (life experience such as child maltreatment) may interact to increase his risk for violence as an adolescent or adult, and how this information might be presented at a criminal trial.

This presentation will impact the forensic community and/or humanity by demonstrating how an increased awareness of how a person's genetic make-up might be used as mitigation at a criminal trial.

Mental health professionals have thought for many years that violent behavior is partly caused by a person's life experiences and partly by inborn genetic influences. Recent research – in which subjects were studied longitudinally from childhood until adulthood – has started to clarify how a child's environment and genetic makeup interact to create a violent ado- lescent or adult. (1) For example, Caspi et al. (Role of Genotype in the Cycle of Violence in Maltreated Children, *Science* 297:851, 2002) studied the monoamine oxidase A (MAOA) gene. When there is a low activity of this gene, neurotransmitters in the brain (serotonin, dopamine, and norepi- nephrine) are not properly metabolized. Caspi et al. found that when male subjects had a low activity of MAOA *and also* were maltreated as children, there was a much greater likelihood the person would manifest violent anti- social behavior in the future. (2) Also, Caspi et al. (Influence of Life Stress on Depression: Moderation by a Polymorphism in the 5-HTT Gene, *Science* 301:386-389, 2003) studied the 5-HTT (5-hydroxytryptamine or serotonin transporter) gene. The "transporter" is the cellular structure that reuptakes serotonin from the synapse. The 5-HTT gene can have either the "long allele" or the "short allele." Caspi et al. suggested that individuals with one or two copies of the short allele "exhibited more depressive symptoms, diagnosable depression, and suicidality in relation to stressful life events" than individuals with two long alleles. Information regarding a defendant's genotype, exposure to child maltreatment, and experience of unusual stress may be appropriate to present during the mitigation phase of criminal trials, especially when capital punishment is a consideration. The presenters will discuss their experience in genotyping criminal defendants and in presenting genetic information at criminal trials. Presenters will review how testimony regarding this use of genotyping has fared in light of *Daubert* criteria.

Genotyping, Violence, Death Penalty

 ** Presenting Author*