

Mechanisms of Drug Deposition in Hair and Issues for Hair Testing

REFERENCE: Ruth JA, Stout PR: Mechanisms of drug deposition in hair and issues for hair testing; *Forensic Sci Rev* 16:115–133; 2004.

ABSTRACT: The purpose of this review is to provide a summary of the knowledge of the mechanisms by which drugs deposit into hair. While much work and many reviews have been produced on methods of analysis of drugs in hair, a smaller body of work and fewer reviews have concentrated on the biochemical mechanisms by which drugs deposit and are retained in hair. Proposed mechanisms are discussed with various studies that have been used to elucidate these mechanisms. While multiple mechanisms are likely involved in the deposition and retention of drugs in hair, melanin and various interactions with melanin including potential covalent linkage of drug with melanin appear to dominate the scheme of interactions. The implications of these interactions are discussed with particular emphasis on the potential difficulties in distinguishing internal deposition from external contamination and the appropriateness of manufacturing control materials. The potential for hair testing to be truly reflective of endogenous deposition may hinge on the ability to isolate and analyze melanin adducts of drugs that would be indicative of endogenous drug deposition during hair growth and active melanogenesis.

KEY WORDS: Drugs in hair, hair testing, melanin.
