Professor Robert S. Hoffman

Robert S. Hoffman received his MD and completed a 3-year internship and residency in Internal Medicine followed by a Fellowship in Medical Toxicology all at NYU School of medicine. He achieved and maintains Board Certification in Internal Medicine, Medical Toxicology, and Emergency Medicine. In 1989 Dr. Hoffman became the director of the Fellowship in Medical Toxicology at the New York City Poison Center, and in 1994 he became the Director of the New York City Poison Center. In 2014 he became the Director of the Division of Medical Toxicology at NYU School of Medicine. Dr. Hoffman has authored over 250 peer-reviewed publications in various aspects of toxicology. He has been an editor of Goldfrank's Toxicologic Emergencies for the last 6 editions. He has held offices in all 3 American Toxicology Societies, and is currently a member of the Board of Trustees of the American Academy of Clinical Toxicology.

Cyclopeptide Poisoning: Botany and Epidemiology

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Certain species from the genera Amanita, Galerina, Lepiota, and Conocybe contain cyclopetide toxins that are responsible for human poisoning. All of these mushrooms belong to the Order Agaricales and the Family Agaricaceae, which characterizes them as fleshy-gilled mushrooms with a centrally attached stipe and a partial veil. Amatoxin containing mushrooms are found worldwide with specimens documented from all six naturally inhabited continents. Experts identify toxic mushrooms of the amanita and related genera by gross morphologic features and the color, pattern, microscopic appearance, and staining of spores. Specialized reagents can also directly identify the toxins in the mushroom with unclear sensitivity and specificity.

Over twenty toxic cyclopeptides are identified from Amanita and related mushroom genera and are classified as amatoxins, phallotoxins, and viratoxins. Among them, only the amatoxins are felt to be responsible for human poisonings because neither the phallotxoins nor the viratoxins are well absorbed across human gastrointestinal mucosa. There are at least ten known amatoxins, of which and alpha- and beta-amanitin are the best studied. These toxins show significant variability in their concentrations within a given mushroom, across mushroom genera and species, and with differing regions of growth.

Most ingestions that produce toxicity are intentional, resulting from confusion of a toxic mushroom with an edible variety. This is easiest to understand at the early egg or button stages of development when toxic mushrooms can be confused for edible puffballs. Errors also occur when people migrate and think they recognize a mushroom that is edible in their home region only to find one that is toxic. Small exploratory ingestions such as those that might occur in a child left in a yard are unlikely to result in toxicity. However, when intentional ingestions occur, toxicity should be expected. Although the case-fatality rate is low with good medical care and is probably less than 20 or even 10%, ingestions of amatoxin containing mushrooms are said to account for approximately 90% of mushroom related fatalities. Most cases and deaths are reported from Europe, which may result from the availability of the mushroom, the relative amount of toxin found in European mushrooms and/or the common practice of mushroom foraging.