

Studies on the inactivation of scrapie-infected brain tissue by incineration

Paul Brown, Edward Rau, and Paul Lemieux

The pathogens that cause transmissible spongiform encephalopathy (TSE) are well known to be uniquely resistant to standard disinfection methods, including exposure to dry heat. In previous experiments using a muffle oven, we demonstrated substantial resistance of freeze-dried crude tissue or PrPres extracts of 263K scrapie-infected hamster brain to 1 hour exposures at 360°C [1]; as well as threshold survival of fresh brain macerates (5 transmissions from 1 g of ash having a total pre-treatment infectivity of 10^9 LD₅₀) after 5-15 min exposures at 600°C [2]. We now report a series of new experiments designed to confirm and extend the previous studies, in which the operating conditions of controlled and excess air types of medical incinerators were more closely simulated using a Lindberg furnace. Both the ash and captured airborne emissions from tissue combustion were saved for bioassay. The 1-year observation period of the bioassays was recently terminated, and brains from all animals, either dying during the observation period, or surviving to termination, are currently being examined for the presence or absence of PrPres.

1. Brown P, Liberski PP, Wolff A, Gajdusek DC (1990) J Infect Dis 161: 467-472.
2. Brown P, Rau EH, Johnson BK, et al. (2000) PNAS 97: 3418-3421.