

Marijuana Smoke

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Marijuana Smoke

- Commonly used drug by young adults
- Exposure is through inhalation of burning flowers, leaves, stem or resin of marijuana plant
- Used for recreational or medicinal purposes
- Combustion products contain carcinogenic and procarcinogenic compounds



Available evidence for consideration

- Epidemiological data
 - identified during human data screen
- Animal carcinogenicity data
- Other relevant data
 - Genotoxicity
 - Carcinogenic constituents of marijuana smoke
 - Immunosuppression
 - Endocrine effects



Marijuana smoke and adult cancers

- Case-control study of head and neck cancers: Zhang *et al.* (1999)
- Case-control study of lung and upper aerodigestive tract cancers: Hashibe *et al.* (2006)
- Case-control study of oral squamous cell carcinoma: Rosenblatt *et al.* (2004)
- Case-control study of transitional cell carcinoma of the bladder: Chacko *et al.* (2006)
- Retrospective cohort study of all cancers: Sidney *et al.* (1997)
- Case series of respiratory tract cancers: Taylor (1988)
- Case reports of transitional cell carcinoma: Nieder *et al.* (2006); Moiche *et al.* (2001)



Parental marijuana smoking and childhood cancers

- Case-control study of acute nonlymphoblastic leukemia: Robison *et al.* (1989)
- Case-control study of childhood rhabdosarcoma: Grufferman *et al.* (1993)



Animal carcinogenicity data

Marijuana smoke condensate

- Skin painting study in mice: Hoffmann *et al.* (1975)
- Subcutaneous administration study in rats: Repetto *et al.* (1979)

Marijuana smoke

- Inhalation study in rats: Murthy *et al.* (1985).



Other Relevant Data

Genotoxicity:

- Somatic cell mutations in mothers and their newborns: Ammenheuser *et al.* (1998)
- DNA adducts in the lungs of exposed monkeys: Talaska *et al.* (1992).



Carcinogenic Constituents in Marijuana Smoke	CAS No.
Acetaldehyde	75-07-0
Benz[a]anthracene	56-55-3
Benzo[a]pyrene	50-32-8
Benzo[k]fluoranthene	207-08-9
Chrysene	218-01-9
Dibenz[a,h]anthracene	53-70-3
Dibenzo[a,e]pyrene	192-65-4



Other Relevant Data

(continued)

- Respiratory and immunological effects: Zhu *et al.* (2000); Tashkin *et al.* (2002); McKallip *et al.* (2005); Massi *et al.* (2006).
- Endocrine-like effects: Watanabe *et al.* (2005).
- Molecular mechanisms: Hart *et al.* (2004)

Reviews: Hashibe *et al.* (2002); Taylor and Hall (2003); Hall *et al.* (2005); Hashibe *et al.*, (2005); Mehra *et al.* (2006).



Comments Received

- Dale Gieringer, Ph.D., Director
California NORML (National Organization for the
Reform of Marijuana Laws)



Discussion

Committee recommendations
regarding next steps on
Marijuana Smoke

