

Report on Carcinogens, 12th Edition
Nominations to be Reviewed in 2004-2005

NOMINATION (CAS NUMBER)	PRIMARY USES OR EXPOSURES	NOMINATED BY	BASIS FOR NOMINATION
Aristolochia-Related Herbal Remedies	Several Aristolochia species (notably <i>A. contorta</i> , <i>A. debilis</i> , <i>A. fangchi</i> and <i>A. manshuriensis</i>) have been used in traditional Chinese medicine as anti-rheumatics, as diuretics, in the treatment of edema and for other conditions such as hemorrhoids, coughs and asthma.	NIEHS ¹	Herbal remedies containing the plant genus <i>Aristolochia</i> : IARC ² finding of sufficient evidence of carcinogenicity in humans (Vol. 83, 2002).
Aristolochic Acid	Aristolochic acid, the principle extract from Aristolochia, is a mixture of nitrophenanthrene carboxylic acids.	NIEHS ¹	Naturally occurring mixtures of aristolochic acids: IARC ² finding of sufficient evidence of carcinogenicity in animals and limited evidence in humans (Vol. 83, 2002).
Asphalt fumes	Asphalt is a petroleum product used in paving and roofing operations. Asphalt fumes are a cloud of small particles generated from the gaseous state after volatilization of asphalt aggregates.	John Schelp of NAACP-Durham Chapter	Human epidemiological studies have reported an increased risk in lung cancer among workers exposed to asphalt fumes and asphalt fumes caused skin tumors in experimental animals. Additionally, known human carcinogens (PAHs) have been found in asphalt fumes.
Atrazine (192-24-9)	Atrazine is an herbicide used to control grass and broad-leaved weeds. Atrazine has been detected at levels that exceeded or approached the MCL for atrazine in 200 community surface drinking water systems.	NIEHS ¹	IARC ² finding of sufficient evidence of carcinogenicity in animals (Vol. 73, 1999).
Benzofuran (271-89-6)	Benzofuran is produced by isolation from coal-tar oils. Benzofuran is used in the manufacture of coumarone-indene resins, which harden when heated and are used to make floor tiles and other products.	NIEHS ¹	Results of a NTP bioassay (TR 370, 1989), which reported <i>clear evidence of carcinogenicity</i> in male and female mice and <i>some evidence of carcinogenicity</i> in female rats.
Captafol (2425-06-01)	Captafol is a fungicide that has been widely used since 1961 for the control of fungal diseases in fruits, vegetables and some other plants. Use of captafol in the United States was banned in 1999.	NIEHS ¹	IARC ² finding of sufficient evidence of carcinogenicity in animals (Vol. 53, 1991). IARC also noted that captafol is positive in many genetic assays, including the <i>in-vivo</i> assay for dominant lethal mutation.

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Cobalt/Tungsten-Carbide Hard Metal Manufacturing	Hard-metals are manufactured by a process of powder metallurgy from tungsten and carbon (tungsten carbide), and small amounts of other metallic compounds using cobalt as a binder. Hard metals are used to make cutting and grinding tools, dies, and wear products for a broad spectrum of industries including oil and gas drilling, and mining.	NIEHS ¹	Recent human cancer studies on the hard metal manufacturing industry showing an association between exposure to hard metals (cobalt tungsten-carbide) and lung cancer.
Di (2-Ethylhexyl) phthalate (DEHP) (117-81-7)	DEHP is mainly used as a plasticizer in polyvinyl chloride (PVC) resins for fabricating flexible vinyl products. PVC resins have been used to manufacture toys, dolls, vinyl upholstery, tablecloths and many other products.	Jun Ki-Chul, President of Aekyung Petrochemical Co., LTD of Seoul, Korea (for delisting).	Currently listed in the RoC as <i>reasonably anticipated to be a human carcinogen</i> IARC reclassification as not classifiable as to its carcinogenicity to humans (Group 3) (Vol.73, 2000). IARC stated that there was sufficient evidence for the carcinogenicity in experimental animals; however, the mechanism for liver tumor involves peroxisome proliferation that is not relevant to humans.
Etoposide in combination with cisplatin and bleomycin	Etoposide in combination with cisplatin and bleomycin is used to treat testicular germ cell cancers.	NIEHS ¹	IARC ² finding of sufficient evidence of carcinogenicity in humans (Vol. 76, 2000).
Etoposide (33419-42-0)	Etoposide is a DNA topoisomerase II inhibitor used in chemotherapy for non-Hodgkin's lymphoma, small-cell lung cancer, testicular cancer, lymphomas and a variety of childhood malignances.	NIEHS ¹	IARC ² finding of limited evidence of carcinogenicity in humans (Vol. 76, 2000).
Glass wool (respirable size): Two nominations: 1) Insulation glass wool fibers 2) Special purposes glass fibers	The major uses of glass wool are in thermal, electrical, and acoustical insulation, weatherproofing, and filtration media. In 1980, approximately 80% of the glass wool produced for structural insulation was used in houses. Special purpose fibers are used for high-efficiency air filtration media, and acid battery separators.	North American Insulation Manufacturers Association nominated glass wool (respirable size) for delisting. Special purpose glass wool fibers: NIEHS ¹	Glass wool (respirable size) is currently listed in the RoC as <i>reasonably anticipated to be a human carcinogen</i> . Insulation glass wool: IARC ² finding of limited evidence of carcinogenicity in animals and evaluation as not classifiable as to its carcinogenicity to humans (Group 3) (Vol. 81, 2002) Special-purpose glass fibers: IARC ² finding of sufficient evidence of carcinogenicity in animals (Vol. 81, 2002).

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Metalworking Fluids	Metal working fluids are complex mixtures that may contain mixtures of oil, emulsifiers, anti-weld agents, corrosion inhibitors, extreme pressure additives, buffers biocides and other additives. They are used to cool and lubricate tools and working surfaces in a variety of industrial machining and grinding operations.	NIEHS ¹	Recent human cancer studies of metal working fluid that show an association between exposure to these materials and cancer at several tissue sites.
ortho-Nitrotoluene (88-72-2)	ortho-Nitrotoluene is used to synthesize agricultural and rubber chemicals, azo and sulfur dyes, and dyes for cotton, wool, silk, leather, and paper.	NIEHS ¹	Results of a NTP bioassay (TR 504, 2002), which reported <i>clear evidence of carcinogenicity</i> in rats and mice.
Oxazepam (604-75-1)	Oxazepam is a benzodiazepine used extensively since the 1960s for the treatment of anxiety and insomnia and in the control of symptoms of alcohol withdrawal.	NIEHS ¹	Results of a NTP bioassay (TR 443, 1993), which reported <i>clear evidence of carcinogenicity</i> in male and female mice.
Riddelliine (23246-96-0)	Riddelliine is found in class of plants growing in western US. Cattle, horses and sheep ingest these toxic plants. Residues have been found in, milk, and honey.	NIEHS ¹	Results of a NTP bioassay (TR 508, 2003), which reported <i>clear evidence of carcinogenicity</i> in male and female rats and mice.
Styrene (100-42-5)	Styrene is used in the production of polystyrene, acrylonitrile-butadiene-styrene resins, styrene-butadiene rubbers and latexes, and unsaturated polystyrene resins.	Lorenzo Tomatis	IARC ² finding of limited evidence of carcinogenicity in animals and limited evidence of carcinogenicity in humans (Vol. 82, 2002).

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<p>Talc</p> <p>Two nominations</p> <p>1) Cosmetic talc</p> <p>2) Occupational exposure to talc</p>	<p>Talc occurs in various geological settings around the world. Exposure to general population occurs through use of products such as cosmetics. Occupational exposure occurs during mining, milling and processing.</p>	<p>NIEHS¹</p>	<p>The NTP deferred consideration of listing talc (asbestiform and non-asbestiform talc) in the 10th RoC because its 2000 review of talc found confusion in the scientific literature over the mineral nature of talc. Given the confusion over defining exposure to talc based on asbestiform fibers, the NTP has decided that the most appropriate approach would be to characterize talc exposure as cosmetic talc and occupational exposure to talc. The basis for the review of talc is as follows:</p> <p>Cosmetic talc: Human epidemiological studies reporting an increased risk of ovarian cancer among women using talc for personal use.</p> <p>Occupational exposure to talc: Human epidemiological studies reporting an increase risk of cancer among workers exposed to talc.</p>
<p>Teniposide (29767-20-2)</p>	<p>Teniposide is a DNA topoisomerase II inhibitors used mainly in the treatment of adult and childhood leukemia.</p>	<p>NIEHS¹</p>	<p>IARC² finding of limited evidence of carcinogenicity in humans (Vol. 76, 2000).</p>
<p>Vinyl Mono-Halides as a class</p>	<p>Vinyl halides are used in the production of polymers and copolymers. Vinyl bromide is mainly used in polymers as a flame retardant and in the production of monoacrylic fibers for carpet-backing materials. Vinyl Chloride is used to produced polyvinyl chloride and copolymers. Vinyl Fluoride is used in the production of polyvinyl fluoride, which when laminated with aluminum, steel and other materials is used as a protective surface for the exteriors of residential and commercial buildings.</p>	<p>NIEHS¹</p>	<p>Vinyl Fluoride and Vinyl Bromide are currently listed in the RoC as <i>reasonably anticipated to be a human carcinogen</i> and Vinyl Chloride is currently listed in the RoC as <i>known to be a human carcinogen</i> in the Report on Carcinogens.</p> <p>Vinyl Mono-Halides: Structural similarities and common mechanisms of tumor formation.</p>

¹ - The National Institute of Environmental Health Sciences (NIEHS)

² – International Agency for Research on Cancer (IARC)