無機ヒ素の疫学研究に関する知見レビュー結果

資料２

◎：LOAEL設定可、●：LOAEL設定不可、評価書へは記載、○：必要あれば評価書に記載、
△：用量反応評価以外の参考、×：評価書に採用しない

文献番号	レビュー結果	著　者	タイトル、雑誌名等	エンドポイント	LOAEL（単位：μg/L）
26	◎	Xia Y, Wade TJ, Wu K, Li Y, Ning Z, Le XC, He X, Chen B, Feng Y, Mumford JL	Well water arsenic exposure, arsenic induced skin-lesions and self-reported morbidity in Inner Mongolia. International Journal of Environmental Research and Public Health 6 (3), 1010-1025. 2009	皮膚病変	5.1～10
29	◎	Ahsan H, Chen Y, Parvez F, Zablotska L, Argos M, Hussain I, Momotaj H, Levy D, Cheng ZQ, Slavkovich V, van Geen A, Howe GR, Graziano JH	Arsenic exposure from drinking water and risk of premalignant skin lesions in Bangladesh: baseline results from the health effects of arsenic longitudinal study. American Journal of Epidemiology 163 (12), 1138-1148. 2006	皮膚病変	8.1～40
25	◎	Rahman M, Vahter M, Sohel N, Yunus M, Wahed MA, Streatfield PK, Ekstrom EC, Persson LA	Arsenic exposure and age and sex-specific risk for skin lesions: a population-based casereferent study in Bangladesh. Environmental Health Perspectives 114 (12), 1847-1852. 2006a	皮膚病変	10-49
48	◎	Chen Y, Graziano JH, Parvez F, Hussain I, Momotaj H, van Geen A, Howe GR, Ahsan H	Modification of risk of arsenic-induced skin lesions by sunlight exposure, smoking, and occupational exposures in Bangladesh. Epidemiology 17(4), 459-467. 2006	皮膚病変	28.1～113
86	◎	Haque R, Mazumder DN, Samanta S, Ghosh N, Kalman D, Smith MM, Mitra S, Santra A, Lahiri S, Das S, De BK, Smith AH	2003. Arsenic in drinking water and skin lesions: dose-response data from West Bengal, India. Epidemiology 14, 174-182.	皮膚病変	50～99
92	◎	Guo XJ, Liu Z, Huang CJ,You L,	2006. Levels of arsenic in drinking-water and cutaneous lesions in Inner Mongolia. Journal of Health, Population and Nutrition 24 (2), 214-220.	皮膚病変	50～199
22	◎	Baastrup R, Sorensen M, Balstrom T, Frederiksen K, Larsen CL, Tjonneland A, et al.	Arsenic in drinking-water and risk for cancer in Denmark. Environ Health Perspect 2008;116(2):231-7.	肺がん、膀胱がん	最高濃度 25.3 μg/Lで影響なし
30	◎	Ferreccio C, Gonzalez C, Milosavjlevic V, Marshall G, Sancha AM, Smith AH	Lung cancer and arsenic concentrations in drinking water in Chile. Epidemiology 11 (6), 673-679.2000	肺がん	30～49
129	◎	Chi-Ling Chen et al	Ingested arsenic, characteristics of well water consumption and risk of different histological types of lung cancer in northeastern Taiwan. Environmental Resesrch, 2010 ;110(5):455-62.	肺がん	300又は125～250（5,000～10,000 μg/L･yrs、平均飲用年数40年より算出）
43	◎	Chen C-L, Hsu L-I, Chiou H-Y, Hsueh Y-M, Chen S-Y, Wu M-M, Chen C-J,	Ingested arsenic,cigarette smoking, and lung cancer risk: A follow-up study in arseniasis-endemic areas in Taiwan.Journal of the American Medical Association 292 (24), 2984-2990. 2004b	肺がん	100～299
13	◎	Smith AH, Marshall G, Yuan Y, Ferreccio C, Liaw J, von Ehrenstein O, et al.	Increased mortality from lung cancer and bronchiectasis in young adults after exposure to arsenic in utero and in early childhood. Environ Health Perspect. 2006;114(8):1293-6.	肺がん	用量反応データなし
39	◎	Kurttio P, Pukkala E, Kahelin H, Auvinen A, Pekkanen J	Arsenic concentrations in well water and risk of bladder and kidney cancer in Finland. Environmental Health Perspectives 107 (9), 705-710. 1999	膀胱がん	0.5

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文献番号	レビュー結果	著　者	タイトル、雑誌名等	エンドポイント	LOAEL（単位：μg/L）
37	◎	Steinmaus C, Yuan Y, Bates MN, Smith AH,	Case-control study of bladder cancer and drinking water arsenic in the Western United States. American Journal of Epidemiology 158 (12), 1193-1201. 2003	膀胱がん	40（下限）、90（平均）（曝露カテゴリー下限80 μg/day、中央値 177μg/dayから算出）
130	◎	Chi-Ling Chen et al	Arsenic in Drinking Water and Risk of Urinary Tract Cancer: A Follow-up Study from Northeastern Taiwan. Cancer Epidemiol Biomarkers Prev; 19 (1), 101-110.January 2010	膀胱がん	125～250（5,000～10,000 μg/L･yrs、平均飲用年数40年より算出）
74	◎	Bates MN, Smith AH, Cantor KP, 1995.	1995.Case-control study of bladder-cancer and arsenic in drinking water. American Journal of Epidemiology 141 (6), 523-530.	膀胱がん	25～45（喫煙者）
36	◎	Bates MN, Rey OA, Biggs ML, Hopenhayn C, Moore LE, Kalman D, Steinmaus C, Smith AH,	Case-control study of bladder cancer and exposure to arsenic in Argentina. American Journal of Epidemiology 159 (4), 381-389.2004	膀胱がん	井戸水利用との関連あり（喫煙者のみ）
149	◎	Meliker et al.	Lifetime exposure to arsenic in drinking water and bladder cancer: a population-based case-control study in Michigan, USA. Cancer Causes Control 21: 745-757, 2010	膀胱がん	最高濃度 >10 μg/Lで影響なし（曝露の90%tile 25 μg/Lでも影響なし）
4	◎	Wasserman GA, Liu X, Parvez F, Ahsan H, Factor-Litvak P, van Geen A, et al.	Water arsenic exposure and children's intellectual function in Araihazar, Bangladesh. Environ Health Perspect. 2004;112(13):1329-33.	神経系（IQ）	50.1～176
2	◎	Wang SX, Wang ZH, Cheng XT, Li J, Sang ZP, Zhang XD, et al.	Arsenic and fluoride exposure in drinking water: children's IQ and growth in Shanyin county, Shanxi province, China. Environ Health Perspect. 2007;115(4):643-7.	神経系（IQ）	142±106
6	◎	Cherry N, Shaikh K, McDonald C, Chowdhury Z.	Stillbirth in rural Bangladesh: arsenic exposure and other etiological factors: a report from Gonoshasthaya Kendra. Bull World Health Organ. 2008;86(3):172-177.	生殖発生（死産）	≧50
10	◎	Milton AH, Smith W, Rahman B, Hasan Z, Kulsum U, Dear K, et al.	Chronic arsenic exposure and adverse pregnancy outcomes in bangladesh. Epidemiology. 2005;16(1):82-6.	生殖発生（自然流産）	51～100
11	◎	Rahman A, Vahter M, Ekstrom EC, Rahman M, Golam Mustafa AH, Wahed MA, et al.	Association of arsenic exposure during pregnancy with fetal loss and infant death: a cohort study in Bangladesh. Am J Epidemiol. 2007;165(12):1389-96.	生殖発生（胎児、乳児死亡）	277～408（胎）、164～275（乳）
14	◎	von Ehrenstein OS, Guha Mazumder DN, Hira-Smith M, Ghosh N, Yuan Y, Windham G, et al.	Pregnancy outcomes, infant mortality, and arsenic in drinking water in West Bengal, India. Am J Epidemiol. 2006;163(7):662-9.	生殖発生（死産）	≧200
5	●	Ahmad SA, Sayed MH, Barua S, Khan MH, Faruquee MH, Jalil A, et al.	Arsenic in drinking water and pregnancy outcomes. Environ Health Perspect. 2001 Jun;109(6):629-31.	生殖発生（死産、流産、早産）	-
9	●	Kwok RK, Kaufmann RB, Jakariya M.	Arsenic in drinking-water and reproductive health outcomes: a study of participants in the Bangladesh Integrated Nutrition Programme. J Health Popul Nutr. 2006;24(2):190-205.	生殖発生	-
12	●	Rahman A, Vahter M, Smith AH, Nermell B, Yunus M, El Arifeen S, et al.	Arsenic exposure during pregnancy and size at birth: a prospective cohort study in Bangladesh. Am J Epidemiol. 2009;169(3):304-312.	生殖発生	-
123	●	Tseng CH, Chong CK, Chen CJ, Tai TY,	1996. Dose-response relationship between peripheral vascular disease and ingested inorganic arsenic among residents in blackfoot disease endemic villages in Taiwan. Atherosclerosis 120 (1-2), 125-133.	心血管疾患	-

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文献番号	レビュー結果	著　者	タイトル、雑誌名等	エンドポイント	LOAEL（単位：μg/L）
1	○	von Ehrenstein OS, Poddar S, Yuan Y, Mazumder DG, Eskenazi B, Basu A, et al.	Children's intellectual function in relation to arsenic exposure. Epidemiology. 2007;18(1):44-51.	神経系	-
3	○	Wasserman GA, Liu X, Parvez F, Ahsan H, Factor-Litvak P, Kline J, et al.	Water arsenic exposure and intellectual function in 6-year-old children in Araihazar, Bangladesh. Environ Health Perspect. 2007;115(2):285-9.	神経系	-
7	○	Hopenhayn-Rich C, Ferreccio C, Browning SR, Huang B, Peralta C, Gibb H, et al.	Arsenic exposure from drinking water and birth weight. Epidemiology. 2003 Sep;14(5):593-602.	生殖発生	-
8	○	Hopenhayn-Rich C, Browning SR, Hertz-Picciotto I, Ferreccio C, Peralta C, Gibb H.	Chronic arsenic exposure and risk of infant mortality in two areas of Chile. Environ Health Perspect. 2000 Jul;108(7):667-73.	生殖発生	-
23	○	Chu HA, Crawford-Brown DJ.	Inorganic arsenic in drinking water and bladder cancer: a meta-analysis for dose-response assessment. Int J Environ Res Public Health 2006;3(4):316-22.	発がん	-
27	○	Chiou HY, Chiou ST, Hsu YH, Chou YL, Tseng CH, Wei ML, Chen CJ,	Incidence of transitional cell carcinoma and arsenic in drinking water: A follow-up study of 8,102 residents in an arseniasis-endemic area in northeastern Taiwan. American Journal of Epidemiology 153 (5), 411-418.2001	発がん	-
35	○	Baastrup R, Sorensen M, Balstrom T, Frederiksen K, Larsen CL, Tjonneland A, Overvad K, Raaschou-Nielsen O	Arsenic in drinking-water and risk for cancer in Denmark. Environmental Health Perspectives 116 (2), 231-237.2008	発がん	-
41	○	Chen CJ, Chen CW, Wu MM, Kuo TL	Cancer potential in liver, lung, bladder and kidney due to ingested inorganic arsenic in drinking water. British Journal of Cancer, 66 (5), 888-892. 1992	発がん	-
47	○	Schuhmacher-Wolz U, Dieter HH, Klein D, Schneider K	Oral exposure to inorganic arsenic: evaluation of its carcinogenic and non-carcinogenic effects. Critical Reviews in Toxicology 39 (4), 271-298. 2009	皮膚病変	-
54	○	Milton AH, Smith W, Rahman B, Hasan Z, Kulsum U, Dear K, Rakibuddin M, Ali A.	Chronic arsenic exposure and adverse pregnancy outcomes in Bangladesh. Epidemiology 16 (1), 82-86. 2005	発生毒性	-
55	○	von Ehrenstein OS, Guha Mazumder DN, Hira-Smith M, Ghosh N, Yuan Y, Windham G, Ghosh A, Haque R, Lahiri S, Kalman D, Das S, Smith AH	Pregnancy outcomes, infant mortality, and arsenic in drinking water in West Bengal, India. American Journal of Epidemiology 163 (7), 662-669. 2006	発生毒性	-
56	○	Rahman A, Vahter M, Ekstrom EC, Rahman M, Mustafa AMG, Wahed MA, Yunus M, Persson LA	Rahman A, Vahter M, Ekstrom EC, Rahman M, Mustafa AMG, Wahed MA, Yunus M, Persson LA, 2007. Association of arsenic exposure during pregnancy with foetal loss and infant death: a cohort study in Bangladesh. American Journal of Epidemiology 165 (12), 1389-1396.	発生毒性	-
58	○	von Ehrenstein OS, Poddar S, Yuan Y, Mazumder DG, Eskenazi B, Basu A, Hira-Smith M, Ghosh N, Lahiri S, Haque R, Ghosh A, Kalman D, Das S, Smith AH	Children's intellectual function in relation to arsenic exposure. Epidemiology 18 (1), 44-51. 2007	発生毒性	-
64	○	Navas-Acien A, Sharrett AR, Silbergeld EK, Schwartz BS, Nachman KE, Burke TA, Guallar E	Arsenic exposure and cardiovascular disease: A systematic review of the epidemiologic evidence. American Journal of Epidemiology 162 (11), 1037-1049.2005	心血管系疾患	-
75	○	Lewis DR, Southwick JW, Ouellet-Hellstrom R, Rench J, Calderon RL,	1999. Drinking water arsenic in Utah: A cohort mortality study. Environmental Health Perspectives 107 (5), 359-365.	発がん	-
78	○	Mink PJ, Alexander DD, Barraj LM, Kelsh MA, Tsuji JS,	2008. Low-level arsenic exposure in drinking water and bladder cancer: A review and meta-analysis. Regulatory Toxicology and Pharmacology 52 (3), 299-310.	発がん	-

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91	○	Yoshida T, Yamauchi H, Sun GF,	2004. Chronic health effects in people exposed to arsenic via the drinking water: dose-response relationships in review. Toxicology and Applied Pharmacology 198 (3), 243-252.	皮膚病変	-
128	○	Tseng CH, Tai TY, Chong CK, Tseng CP, Lai MS, Lin BJ, Chiou HY, Hsueh YM, Hsu KH, Chen CJ,	2000. Long-term arsenic exposure and incidence of non-insulin-dependent diabetes mellitus: A cohort study in arseniasis-hyperendemic villages in Taiwan. Environmental Health Perspectives 108 (9), 847-851.	糖尿病	-
15	△	Yang CY, Chang CC, Tsai SS, Chuang HY, Ho CK, Wu TN.	Arsenic in drinking water and adverse pregnancy outcome in an arseniasis-endemic area in northeastern Taiwan. Environ Res. 2003;91(1):29-34.	生殖発生	-
16	△	An Y, Gao Z, Wang Z, Yang S, Liang J, Feng Y, et al.	Immunohistochemical analysis of oxidative DNA damage in arsenic-related human skin samples from arsenic-contaminated area of China. Cancer Lett. 2004 Oct 8;214(1):11-8.	遺伝毒性	-
17	△	Beckman G, Beckman L, Nordenson I.	Chromosome aberrations in workers exposed to arsenic. Environ Health Perspect. 1977 Aug;19:145-6.	遺伝毒性	-
20	△	Matsui M, Nishigori C, Toyokuni S, Takada J, Akaboshi M, Ishikawa M, et al.	The role of oxidative DNA damage in human arsenic carcinogenesis: detection of 8-hydroxy-2'-deoxyguanosine in arsenic-related Bowen's disease. J Invest Dermatol. 1999 Jul;113(1):26-31.	遺伝毒性	-
21	△	Vuyyuri SB, Ishaq M, Kuppala D, Grover P, Ahuja YR.	Evaluation of micronucleus frequencies and DNA damage in glass workers exposed to arsenic. Environ Mol Mutagen. 2006 Aug;47(7):562-70.	遺伝毒性	-
24	△	Huang YK, Huang YL, Hsueh YM, Yang MH, Wu MM, Chen SY, et al.	Arsenic exposure, urinary arsenic speciation, and the incidence of urothelial carcinoma: a twelve-year follow-up study. Cancer Causes Control 2008;19(8):829-39.	発がん	-
49	△	Hopenhayn C, Ferreccio C, Browning SR, Huang B, Peralta C, Gibb H, Hertz-Picciotto I	Arsenic exposure from drinking water and birth weight. Epidemiology 14 (5), 593-602. 2003b	発生毒性	-
50	△	Rahman A, Vahter M, Smith AH, Nermell B, Yunus M, El Arifeen S, Persson LA, Ekstrom EC	Arsenic exposure during pregnancy and size at birth: a prospective cohort study in Bangladesh. American Journal of Epidemiology 169 (3), 304-312. 2009	発生毒性	-
57	△	Sen J, Chaudhuri AB	Arsenic exposure through drinking water and its effect on pregnancy outcome in Bengali women. Arhiv za Higijenu Rada Toksikologiju 59, 271-275. 2008	発生毒性	-
59	△	Wasserman GA, Liu XH, Parvez F, Ahsan H, Factor-Litvak P, Kline J, Van Geen A, Slavkovich V, Lolacono NJ, Levy D, Cheng ZQ, Graziano JH	Water arsenic exposure and intellectual function in 6-year-old children in Araihazar, Bangladesh. Environmental Health Perspectives 115 (2), 285-289. 2007	発生毒性	-
60	△	Tofail F, Vahter M, Hamadani JD, Nermell B, Huda SN, Yunus M, Rahman M, Grantham-McGregor SM	Effect of arsenic exposure during pregnancy on infant development at 7 months in rural Matlab, Bangladesh. Environmental Health Perspectives 117 (2), 288-293. 2009	発生毒性	-
61	△	Otto D, Xia Y, Wu K, He L, Telech J, Hundell H, Prah J, Mumford J,Wade T	Neurosensory effects of chronic human exposure to arsenic associated with body burden and environmental measures. Human & Experimental Toxicology 26 (3), 169-177. 2007	神経系	-
62	△	Hafeman DM, Ahsan H, Louis ED, Siddique AB, Slavkovich V, Cheng ZQ, van Geen A, Graziano JH	Association between arsenic exposure and a measure of subclinical sensory neuropathy in Bangladesh. Journal of Occupational and Environmental Medicine 47 (8), 778-784. 2005	神経系	-

◎：LOAEL設定可、●：LOAEL設定不可、評価書へは記載、○：必要あれば評価書に記載、
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79	△	Liao CM, Shen HH, Chen CL, Hsu LI, Lin TL, Chen SC, Chen CJ,	2009a. Risk assessment of arsenicinduced internal cancer at long-term low dose exposure. Journal of Hazardous Materials 165 (1-3), 652-663.	発がん	-
99	△	Rahman M, Vahter M, Wahed MA, Sohel N, Yunus M, Streatfield PK, El Arifeen S, Bhuiya A, Zaman K, Chowdhury AMR, Ekstrom EC, Persson LA,	2006b. Prevalence of arsenic exposure and skin lesions. A population based survey in Matlab, Bangladesh. Journal of Epidemiology and Community Health 60 (3), 242-248.	発生毒性	-
108	△	Raqib R, Ahmed S, Sultana R, Wagatsuma Y, Mondal D, Hoque AMW, Nermell B, Yunus M, Roy S, Persson LA, El Arifeen S, Moore S, Vahter M,	2009. Effects of in utero arsenic exposure on child immunity and morbidity in rural Bangladesh. Toxicology Letters 185 (3), 197-202.	発生毒性（発達）	-
109	△	Calderon J, Navarro ME, Jimenez-Capdeville ME, Santos-Diaz MA, Golden A, Rodriguez-Levya I, Borja-Aburto V, Diaz-Barriga F,	2001. Exposure to arsenic and lead and neuropsychological development in Mexican children. Environmental Research 85 (2), 69-76.	発生毒性（発達）	-
110	△	Tsai SY, Chou HY, The HW, Chen CM, Chen CJ,	2003. The effects of chronic arsenic exposure from drinking water on the neurobehavioral development in adolescence. Neurotoxicology 24 (4-5), 747-753.	発生毒性（発達）	-
112	△	Yamashita N, Doi M, Nishio M, Hojo H, Tanaka M,	1972. Recent observations of Kyoto children poisoned by arsenic tainted "Morinaga Dried Milk". Japanese Journal of Hygiene 27 (4), 364-399.	発達神経	-
113	△	Dakeishi M, Murata K, Grandjean P,	2006. Long-term consequences of arsenic poisoning during infancy due to contaminated milk powder. Environmental Health 5 (31).	発達神経	-
114	△	Tseng HP, Wang YH, Wu MM, The HW, Chiou HY, Chen CJ,	2006. Association between chronic exposure to arsenic and slow nerve conduction velocity among adolescents in Taiwan. Journal of Health Population and Nutrition 24 (2), 182-189.	発達神経	-
115	△	Rosado JL, Ronquillo D, Kordas K, Rojas O, Alatorre J, Lopez P, Garcia-Vargas G, Del Carmen CM, Cebrian ME, Stoltzfus R J,	2007. Arsenic exposure and cognitive performance in Mexican schoolchildren. Environmental Health Perspectives 115, 1371-1375.	発達神経	-
117	△	Kishi Y, Sasaki H, Yamasaki H, Ogawa K, Nishi M, Nanjo K,	2001. An epidemic of arsenic neuropathy from a spiked curry. Neurology 56 (10), 1417-1418.	発達神経	-
120	△	Kreiss K, Zack MM, Feldman RG, Niles CA, Chiricopost J, Sax DS, Landrigan PJ, Boyd MH, Cox DH,	1983. Neurologic evaluation of a population exposed to arsenic in Alaskan well water. Archives of Environmental Health 38 (2), 116-121.	神経毒性（急性、末梢）	-
148	△	Raml R, Raber G, Rumpler A, Bauernhofer T, Goessler W, Francesconi KA.	Individual Variability in the Human Metabolism of an Arsenic-Containing Carbohydrate, 2′,3′-Dihydroxypropyl 5-deoxy-5-dimethylarsinoyl-β-d-riboside, a Naturally Occurring Arsenical in Seafood. Chem Res Toxicol. 2009 Sep;22(9):1534-40.	（動態）	-
18	×	Chanda S, Dasgupta UB, Guhamazumder D, Gupta M, Chaudhuri U, Lahiri S, et al.	DNA hypermethylation of promoter of gene p53 and p16 in arsenic-exposed people with and without malignancy. Toxicol Sci. 2006 Feb;89(2):431-7.	遺伝毒性	-
19	×	Marsit CJ, Karagas MR, Danaee H, Liu M, Andrew A, Schned A, et al.	Carcinogen exposure and gene promoter hypermethylation in bladder cancer. Carcinogenesis. 2006;27(1):112-6.	遺伝毒性	-
28	×	Karagas MR, Stukel TA, Tosteson TD	Assessment of cancer risk and environmental levels of arsenic in New Hampshire. International Journal of Hygiene and Environmental Health 205 (1-2), 85-94.2002	発がん	-
31	×	Karagas MR, Tosteson TD, Morris JS, Demidenko E, Mott LA, Heaney J, Schned A,	Incidence of transitional cell carcinoma of the bladder and arsenic exposure in New Hampshire. Cancer Causes & Control 15 (5), 465-472. 2004	発がん	-

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32	×	Karagas MR, Le XC, Morris S, Blum J, Lu X, Spate V, Carey M, Stannard V, Klaue B, Tosteson TD,	Markers of low level arsenic exposure for evaluating human cancer risks in a US population.International Journal of Occupational Medicine and Environmental Health 14 (2), 171-175.2001	発がん	−
33	×	Karagas MR, Tosteson TD, Blum J, Klaue B, Weiss JE, Stannard V, Spate V, Morris JS	Measurement of low levels of arsenic exposure: A comparison of water and toenail concentrations. American Journal of Epidemiology 152 (1), 84-90. 2000	発がん	−
34	×	Beane Freeman LE, Dennis LK, Lynch CF, Thorne PS, Just CL,	Toenail arsenic content and cutaneous melanoma in Iowa. American Journal of Epidemiology 160 (7), 679-687. 2004	発がん	−
38	×	Michaud DS, Wright ME, Cantor KP, Taylor PR, Virtamo J, Albanes D,	Arsenic concentrations in prediagnostic toenails and the risk of bladder cancer in a cohort study of male smokers. American Journal of Epidemiology 160 (9), 853-859.2004	発がん	−
40	×	Chen CJ, Chuang YC, Lin TM, Wu HY	Malignant neoplasms among residents of a blackfoot disease-endemic area in Taiwan: high-arsenic artesian well water and cancers. Cancer Research, 45 (11 Pt 2), 5895-5899. 1985	発がん	−
42	×	Smith AH, Ercumen A, Yuan Y, Steinmaus CM	Increased lung cancer risks are similar whether arsenic is ingested or inhaled. Journal of Exposure Science and Environmental Epidemiology 19 (4), 343-348. 2009	発がん	−
44	×	Mostafa MG, McDonald JC, Cherry NM	Lung cancer and exposure to arsenic in rural Bangladesh. Occupational and Environmental Medicine 65 (11), 765-768. 2008	発がん	−
45	×	Heck JE, Andrew AS, Onega T, Rigas JR, Jackson BP, Karagas MR and Duell EJ	Lung cancer in a US population with low to moderate arsenic exposure. Environmental Health Perspectives, in press, doi: 10.1289/ehp.0900566. 2009	発がん	−
46	×	Fatmi Z, Azam I, Ahmed F, Kazi A, Gill AB, Kadir MM, Ahmed M, Ara N, Janjua NZ	Health burden of skin lesions at low arsenic exposure through groundwater in Pakistan. Is river the source? Environmental Research, 109 (5), 575-581. 2009	皮膚病変	−
51	×	Lindberg AL, Goessler W, Gurzau E, Koppova K, Rudnai P, Kumar R, Fletcher T, Leonardi G, Slotova K, Gheorghiu E, Vahter M	Arsenic exposure in Hungary, Romania and Slovakia. Journal of Environmental Monitoring 8 (1), 203-208. 2006	発生毒性	−
52	×	Lindberg AL, Ekstrom EC, Nermell B, Rahman M, Lonnerdal B, Persson LA, Vahter M	Gender and age differences in the metabolism of inorganic arsenic in a highly exposed population in Bangladesh. Environmental Research, 106 (1), 110-120. 2008a	発生毒性	−
53	×	Vahter ME, Li L, Nermell B, Rahman A, El Arifeen S, Rahman M, Persson LA, Ekstrom EC	Arsenic exposure in pregnancy: a population-based study in Matlab, Bangladesh. Journal of Health, Population, and Nutrition, 24, 236-245. 2006	発生毒性	−
63	×	Grandjean P, Murata K	Developmental arsenic neurotoxicity in retrospect. Epidemiology 18 (1), 25-26. 2007	神経毒性	−
65	×	Navas-Acien A, Silbergeld EK, Streeter RA, Clark JM, Burke TA, Guallar E	Arsenic exposure and type 2 diabetes: A systematic review of the experimental and epidemiologic evidence. Environmental Health Perspectives 114 (5), 641-648.2006	糖尿病等	−
66	×	Navas-Acien A, Silbergeld EK, Pastor-Barriuso R, Guallar E	Arsenic exposure and prevalence of type 2 diabetes in US adults. Journal of the American Medical Association 300 (7), 814-822. 2008	糖尿病等	−
67	×	Steinmaus C, Yuan Y, Liaw J, Smith AH	Low-level population exposure to inorganic arsenic in the United States and diabetes mellitus. Epidemiology 20 (6), ahead of print, doi: 10.1097/EDE.0b013e3181b0fd29. 2009	糖尿病等	−
68	×	Grantham DA, Jones JF.	Arsenic contamination of water wells in Nova Scotia. Journal of American Water Works Association 1977;69:653-657.	ヒ素中毒	−

◎：LOAEL設定可、●：LOAEL設定不可、評価書へは記載、○：必要あれば評価書に記載、
△：用量反応評価以外の参考、×：評価書に採用しない

文献番号	レビュー結果	著　者	タイトル、雑誌名等	エンドポイント	LOAEL（単位：μg/L）
69	×	Yilmaz Y, Armagan E, Olmez O, Esen M, Alkis N, Dolar E,	Acute arsenic self-poisoning for suicidal purpose in a dentist: a case report. Human & Experimental Toxicology 28 (1), 63-65.2009	短期影響	−
70	×	Kim LH, Abel SJ, 2009.	Survival after a massive overdose of arsenic trioxide. Critical Care Resuscitation 11 (1), 42-45	短期影響	−
71	×	ATSDR	2007. Toxicological profile for arsenic. U. S. Department of Health and Human Services, Public Health Service. Atlanta, GA.	亜慢性　神経毒性（中枢）	−
72	×	IARC 1987	1987. IARC Monographs on the Evaluation of the Carcinogenic Risks to Humans, Suppl. 7, Overall Evaluations of Carcinogenicity: An Updating of IARC Monographs Volumes 1 to 42, Lyon, France.	発がん	−
73	×	IARC 2004	2004. Some drinking-water disinfectants and contaminants, including arsenic. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans. 84, pp. 526.	発がん	−
76	×	Hinwood AL, Jolley DJ, Sim MR,	1999. Cancer incidence and high environmental arsenic concentrations in rural populations: results of an ecological study. International Journal of Environmental Health Research 9 (2), 131-141.	発がん	−
77	×	Cantor KP, Lubin JH,	2007. Arsenic, internal cancers, and issues in inference from studies of lowlevel exposures in human populations. Toxicology and Applied Pharmacology 222 (3), 252-257.	発がん	−
80	×	Guo HR,	2004. Arsenic level in drinking water and mortality of lung cancer (Taiwan). Cancer Causes & Control 15 (2), 171-177.	発がん	−
81	×	Yang CY, Chang CC, Chiu HF,	2008. Does Arsenic exposure Iincrease the risk for prostate cancer? Journal of Toxicology and Environmental Health-Part A-Current Issues 71 (23), 1559-1563.	発がん	−
83	×	Ahsan H, Perrin M, Rahman A, Parvez F, Stute M, Zheng Y, Milton AH, Brandt-Rauf P, van Geen A, Graziano J,	2000. Associations between drinking water and urinary arsenic levels and skin lesions in Bangladesh. Journal of Occupational and Environmental Medicine 42 (12), 1195-1201.	皮膚病変	−
84	×	McDonald C, Hoque R, Huda N, Cherry N,	2007. Risk of arsenic-related skin lesions in Bangladeshi villages at relatively low exposure: a report from Gonoshasthaya Kendra. Bulletin of the World Health Organization 85 (9), 668-673	皮膚病変	−
85	×	Guha Mazumder DN, Haque R, Ghosh N, De BK, Santra A, Chakraborty D, Smith AH,	1998. Arsenic levels in drinking water and the prevalence of skin lesions in West Bengal, India. International Journal of Epidemiology 27, 871-877.	皮膚病変	−
93	×	Kazi TG, Arain MB, Baig JA, Jamali MK, Afridi HI, Jalbani N, Sarfraz RA, Shah AQ, Niaz A,	2009. The correlation of arsenic levels in drinking water with the biological samples of skin disorders. Science of the Total Environment 407 (3), 1019-1026.	皮膚病変	−
95	×	Chen CJ, Hsu LI, Wang CH, Shih WL, Hsu YH, Tseng MP, Lin YC, Chou WL, Chen CY, Lee CY, Wang LH, Cheng YC, Chen CL, Chen SY, Wang YH, Hsueh YM, Chiou HY, Wu MM,	2005. Biomarkers of exposure, effect, and susceptibility of arsenic-induced health hazards in Taiwan. Toxicology and Applied Pharmacology 206 (2), 198-206.	皮膚病変	−
96	×	Kalra T, Argos M, Rathouz P, Parvez F, Graziano J, Ahsan H,	2009. A prospective cohort study of arsenic exposure from drinking water and incident skin lesions in Bangladesh. American Journal of Epidemiology 169, S91-S91.	皮膚病変	−
97	×	Fatmi Z, Azam I, Ahmed F, Kazi A, Gill AB, Kadir MM, Ahmed M, Ara N, Janjua NZ,	2009. Health burden of skin lesions at low arsenic exposure through groundwater in Pakistan. Is river the source? Environmental Research, 109 (5), 575-581.	皮膚病変	−

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文献番号	レビュー結果	著　者	タイトル、雑誌名等	エンドポイント	LOAEL（単位：μg/L）
98	×	Vahter M,	1999. Methylation of inorganic arsenic in different mammalian species and population groups. Science Progress 82 (1), 69-88.	発生毒性	−
100	×	Huyck KL, Kile ML, Mahiuddin G, Quamruzzaman Q, Rahman M, Breton CV, Dobson CB, Frelich J, Hoffman E, Yousuf J, Afroz S, Islam S, Christiani DC,	2007. Maternal arsenic exposure associated with low birth weight in Bangladesh. Journal of Occupational and Environmental Medicine 49 (10), 1097-1104.	発生毒性	−
101	×	Myers SL, Lobdell DT, Liu Z, Xia Y, Ren H, Li Y, Kwok RK, Mumford JL, Mendola P,	2009. Maternal drinking water arsenic exposure and perinatal outcomes in Inner Mongolia, China. Journal of Epidemiology and Community Health, ahead of print, doi:10.1136/jech.2008.084392	発生毒性	−
102	×	Godfrey KM, Barker DJP,	2000. Fetal nutrition and adult disease. American Journal of Clinical Nutrition 71 (5), 1344S-1352S.	発生毒性	−
103	×	Langley-Evans SC, 2	2006. Developmental programming of health and disease. Proceedings of the Nutrition Society 65 (1), 97-105.	発生毒性	−
104	×	Vahter ME,	2007. Interactions between arsenic-induced toxicity and nutrition in early life. Journal of Nutrition 137 (12), 2798-2804.	発生毒性	−
105	×	Vahter M,	2008. Health effects of early life exposure to arsenic. Basic & Clinical Pharmacology & Toxicology 102 (2), 204-211.	発生毒性	−
106	×	Soto-Pena GA, Luna AL, Acosta-Saavedra L, Conde-Moo P, Lopez-Carrillo L, Cebrian ME, Bastida M, Calderon-Aranda ES, Vega L,	2006. Assessment of lymphocyte subpopulations and cytokine secretion in children exposed to arsenic. Faseb Journal 20 (2), 779-781.	発生毒性	−
107	×	Ferrario D, Croera C, Brustio R, Collotta A, Bowe G, Vahter M, Gribaldo L,	2008. Toxicity of inorganic arsenic and its metabolites on haematopoietic progenitors "in vitro": Comparison between species and sexes. Toxicology 249 (2-3), 102-108.	発生毒性	−
116	×	Kawasaki S, Yazawa S, Ohnishi A, Ohi T,	2002. Chronic and predominantly sensory polyneuropathy in Toroku Valley where a mining company produced arsenic. Rinsho Shinkeigaku 42 (6), 504-511.	神経毒性	−
118	×	Goebel HH, Schmidt PF, Bohl J, Tettenborn B, Kramer G, Gutmann L,	1990. Polyneuropathy due to acute arsenic intoxication - biopsy studies. Journal of Neuropathology and Experimental Neurology 49 (2), 137-149.	神経毒性（末梢）	−
119	×	Greenberg SA,	1996. Acute demyelinating polyneuropathy with arsenic ingestion. Muscle & Nerve 19 (12), 1611-1613.	神経毒性	−
133	×	Liao CM, Lin TL, Hsieh NH, Chen WY.	Assessing the arsenic-contaminated rice (Oryza sativa) associated children skin lesions. J Hazard Mater. 2010 Apr 15;176(1-3):239-51. Epub 2009 Nov 10.	皮膚病変	−
136	×	Chen Y, Parvez F, Gamble M, Islam T, Ahmed A, Argos M, Graziano JH, Ahsan H.	Arsenic exposure at low-to-moderate levels and skin lesions, arsenic metabolism, neurological functions, and biomarkers for respiratory and cardiovascular diseases: review of recent findings from the Health Effects of Arsenic Longitudinal Study (HEALS) in Bangladesh. Toxicol Appl Pharmacol. 2009 Sep 1;239(2):184-92. Epub 2009 Jan 27.	皮膚病変	−
141	×	Liao YT, Li WF, Chen CJ, Prineas RJ, Chen WJ, Zhang ZM, Sun CW, Wang SL.	Synergistic effect of polymorphisms of paraoxonase gene cluster and arsenic exposure on electrocardiogram abnormality. Toxicol Appl Pharmacol. 2009 Sep 1;239(2):178-83. Epub 2008 Dec 20.	遺伝多型	−
143	×	Nicolis I, Curis E, Deschamps P, Bénazeth S.	Arsenite medicinal use, metabolism, pharmacokinetics and monitoring in human hair. Biochimie. 2009 Oct;91(10):1260-7. Epub 2009 Jun 13.	医薬品利用	−

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△：用量反応評価以外の参考、×：評価書に採用しない

文献番号	レビュー結果	著　者	タイトル、雑誌名等	エンドポイント	LOAEL（単位：μg/L）
144	×	Argos M, Kalra T, Rathouz PJ, Chen Y, Pierce B, Parvez F, Islam T, Ahmed A, Rakibuz-Zaman M, Hasan R, Sarwar G, Slavkovich V, van Geen A, Graziano J, Ahsan H	Arsenic exposure from drinking water, and all-cause and chronic-disease mortalities in Bangladesh (HEALS): a prospective cohort study. 2010. The Lancet. In press	死亡率	−
145	×	Kojima C, Ramirez DC, Tokar EJ, Himeno S, Drobná Z, Stýblo M, Mason RP, Waalkes MP.	Requirement of arsenic biomethylation for oxidative DNA damage.J Natl Cancer Inst. 2009 Dec 16;101(24):1670-81.	遺伝毒性	−
146	×	Suzuki S, Arnold LL, Pennington KL, Chen B, Naranmandura H, Le XC, Cohen SM.	Dietary administration of sodium arsenite to rats: Relations between dose and urinary concentrations of methylated and thio-metabolites and effects on the rat urinary bladder epithelium. Toxicol Appl Pharmacol. 2010 Apr 15;244(2):99-105.	遺伝毒性	−
147	×	Naranmandura H, Ogra Y, Iwata K, Lee J, Suzuki KT, Weinfeld M, Le XC.	Evidence for toxicity differences between inorganic arsenite and thioarsenicals in human bladder cancer cells. Toxicol Appl Pharmacol. 2009 Jul 15;238(2):133-40. Epub 2009 May 12.	遺伝毒性	−
82	×	Straif K, Benbrahim-Tallaa L, Baan R, Grosse Y, Secretan B, El Ghissassi F, Bouvard V, Guha N, Freeman C, Galichet L, Cogliano V, the Working Group WHO/IARC,	2009. A review of human carcinogens-Part C: metals, arsenic, dusts, and fibres. Lancet Oncology 10 (5), 453-454.	発がん	−
87	×	Wu D, Zhou G, Xu R, Chen G, Dai G, Zhang H, Zang F, Gao T, Yang F,	1992. The investigation of arsenism caused by high arsenic content driking water in Huhhot. Neimenggu Difangbing Fangzhiyanjiu 17, 150-153 (in Chinese).	皮膚病変	−
88	×	Li G, Gao H, Zhang Z, Guo X, Dai G, Zhai C, Yan G, Du J,	1994. Epidemiological investigation on the skin lesions of resident in arsenism area. Neimenggu Difangbing Fangzhiyanjiu (Journal of Endemic Diseases Control Study in Inner Mongolia) 19 (suppl), 50-51 (in Chinese).	皮膚病変	−
89	×	Luo Z, Ma L, Zang Y, Zang G, Naren G, Fan C, Zhou Y, Li H, Dai Q, Liang X,	1994. Investigtion on the chronic arsenism in Huhhot. Neimenggu Difangbing Fangzhiyanjiu 19(suppl), 44-47 (in Chinese).	皮膚病変	−
90	×	Sun Y, Wang J, Wu Y,	1994. Investigation report about chronic arsenism in Bayinmaodao. Neimenggu Difangbing Fangzhiyanjiu 19 (suppl), 63-66 (in Chinese).	皮膚病変	−
94	×	NRC (National Research Council), 2001.	2001. Arsenic in drinking water 2001 Update. National Academy Press, Washington, D.C. Available from: http://www.nap.edu/openbook/0309076293/html/R1.html, p. 226.	皮膚病変	−
111	×	WHO/IPCS	1981. Environmental Health Criteria 18, Arsenic.	発生毒性（神経毒性）	−
121	×	NRC	1999. Arsenic in drinking water. National Academy Press, Washington, D.C. Available from: http://www.nap.edu/openbook/0309063337/html/R1.html, pp. 310	神経毒性（末梢）	−
122	×	Tseng CH,	2008. Cardiovascular disease in arsenic-exposed subjects living in the arseniasishyperendemic areas in Taiwan. Atherosclerosis 199 (1), 12-18.	心血管疾患	−
124	×	Tsai SM, Wang TN, Ko YC,	1999. Mortality for certain diseases in areas with high levels of arsenic in drinking water. Archives of Environmental Health 54 (3), 186-193.	心血管疾患	−

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△：用量反応評価以外の参考、×：評価書に採用しない

文献番号	レビュー結果	著　者	タイトル、雑誌名等	エンドポイント	LOAEL（単位：μg/L）
125	×	Wu MM, Kuo TL, Hwang YH, Chen CJ,	1989. Dose-response relation between arsenic concentration in well water and mortality from cancers and vascular diseases. American Journal of Epidemiology 130 (6), 1123-1132.	心血管系疾患	-
126	×	Engel RR, Smith AH,	1994. Arsenic in drinking-water and mortality from vascular-disease - an ecologic analysis in 30 counties in the United States. Archives of Environmental Health 49 (5), 418-427.	心血管系疾患	-
127	×	Zierold KM, Knobeloch L, Anderson H,	2004. Prevalence of chronic diseases in adults exposed to arsenic-contaminated drinking water. American Journal of Public Health 94, 1936-	心血管系疾患	-
131	×	Dastgiri S, Mosaferi M, Fizi MA, Olfati N, Zolali S, Pouladi N, Azarfam P.	Arsenic exposure, dermatological lesions, hypertension, and chromosomal abnormalities among people in a rural community of northwest Iran. J Health Popul Nutr. 2010 Feb;28(1):14-22.	皮膚病変 心血管系障害等	-
132	×	Wu B, Chen T.	Changes in hair arsenic concentration in a population exposed to heavy pollution: follow-up investigation in Chenzhou City, Hunan Province, southern China. J Environ Sci (China). 2010;22(2):283-9.	髪中ヒ素と曝露量	-
134	×	Arain MB, Kazi TG, Baig JA, Jamali MK, Afridi HI, Jalbani N, Sarfraz RA, Shah AQ, Kandhro GA.	Respiratory effects in people exposed to arsenic via the drinking water and tobacco smoking in southern part of Pakistan. Sci Total Environ. 2009 Oct 15;407(21):5524-30. Epub 2009 Aug 7.	呼吸器疾患	-
135	×	Wang CH, Chen CL, Hsiao CK, Chiang FT, Hsu LI, Chiou HY, Hsueh YM, Wu MM, Chen CJ.	Increased risk of QT prolongation associated with atherosclerotic diseases in arseniasis-endemic area in southwestern coast of Taiwan. Toxicol Appl Pharmacol. 2009 Sep 15;239(3):320-4. Epub 2009 Jun 30.	心血管系障害	-
137	×	Hall MN, Liu X, Slavkovich V, Ilievski V, Mi Z, Alam S, Factor-Litvak P, Ahsan H, Graziano JH, Gamble MV.	Influence of cobalamin on arsenic metabolism in Bangladesh. Environ Health Perspect. 2009 Nov;117(11):1724-9. Epub 2009 Jul 31.	代謝	-
138	×	Xu Y, Li X, Zheng Q, Wang H, Wang Y, Sun G.	Lack of association of glutathione-S-transferase omega 1(A140D) and omega 2 (N142D) gene polymorphisms with urinary arsenic profile and oxidative stress status in arsenic-exposed population. Mutat Res. 2009 Sep-Oct;679(1-2):44-9. Epub 2009 Jul 25.	代謝	-
139	×	Valenzuela OL, Drobná Z, Hernández-Castellanos E, Sánchez-Peña LC, García-Vargas GG, Borja-Aburto VH, Stýblo M, Del Razo LM.	Association of AS3MT polymorphisms and the risk of premalignant arsenic skin lesions. Toxicol Appl Pharmacol. 2009 Sep 1;239(2):200-7. Epub 2009 Jun 16.	皮膚病変 遺伝子多型	-
140	×	Fängström B, Hamadani J, Nermell B, Grandér M, Palm B, Vahter M.	Impaired arsenic metabolism in children during weaning. Toxicol Appl Pharmacol. 2009 Sep 1;239(2):208-14. Epub 2009 Jan 6.	代謝	-
142	×	Komissarova EV, Rossman TG.	Arsenite induced poly(ADP-ribosyl)ation of tumor suppressor P53 in human skin keratinocytes as a possible mechanism for carcinogenesis associated with arsenic exposure. Toxicol Appl Pharmacol. 2010 Mar 15;243(3):399-404. Epub 2009 Dec 28.	皮膚病変 遺伝子多型	-