# Summary Table by Chemical of Carcinogenicity Results in CPDB on 1547 Chemicals

A. Rats and Mice
B. Hamsters
C. Monkeys
D. Dogs, Tree Shrews, Bush Babies

**Positivity:** For each positive (carcinogenic) chemical in the CPDB, results are included on carcinogenic potency (by species) and target site (by sex-species). A target site is listed for a chemical in a sex-species group if the published author's opinion about any experiment indicated that tumors were induced by the compound at that site. NCI/NTP target sites are included if the evaluation in the Technical Report was "carcinogenic" or "clear" or "some" evidence of carcinogenic activity; NCI evaluations of "associated" or NTP evaluations of "equivocal" are not considered positive. We use the author's opinion to classify positivity because it often takes into account more information than statistical significance alone, such as historical control rates for particular strains and sites, survival and latency, or dose response. Generally, this designation by author's opinion corresponds well with the results of statistical tests for the significance of the dose-response effect (two-tailed $p<0.01$). The table presents the strongest evidence of carcinogenicity for each chemical in each sex-species group; thus, if there are both positive and negative experiments in a sex-species, the negative results are ignored in this table. Additionally, if there is more than one positive experiment in a sex-species group, then the target sites listed may be from more than one experiment, e.g. if liver and lung are both listed, then liver may have been a target in one experiment and lung in another.

If all experimental results in the CDPB are negative in a sex-species group, "–" appears. If the CPDB has no experiments in the sex-species group, "." appears. An "I" indicates that the only experiment in the group in the CPDB was an NCI or NTP test, and that NCI or NTP evaluated the experiment as inadequate. A "B" indicates that results from the general literature were only reported for males and females combined.

**Harmonic mean of $TD_{50}$:** If more than one experiment is positive in the CPDB, the reported $TD_{50}$ is the harmonic mean of the most potent $TD_{50}$ value from each positive experiment in the species and the superscript "m" follows the $TD_{50}$ value in the table to indicate multiple positive tests. See http://potency.berkeley.edu/td50harmonicmean.html for more details.

**Mutagenicity:** A chemical is classified as mutagenic ("+") in the *Salmonella* assay if it was evaluated as either "mutagenic" or "weakly mutagenic" by Zeiger (Gold and Zeiger, eds., *Handbook of Carcinogenic Potency and Genotoxicity Databases*, CRC Press, 1997, pp. 687-729; Zeiger, pers. comm.) or as "positive" by the Gene-Tox Program (Kier et al., *Mutat. Res.* 168: 69-240, 1986; Auletta, pers. comm.). Other chemicals evaluated for mutagenicity by these two sources are reported as "–". The symbol "." indicates no evaluation in *Salmonella*. Of the 1547 chemicals in the CPDB, 860 have evaluations of mutagenicity in *Salmonella* from these sources.

**Tissue codes:** adr = adrenal gland; bon = bone; cli = clitoral gland; eso = esophagus; ezy = ear/Zymbal's gland; gal = gall bladder; hag = harderian gland; hmo = hematopoietic system; kid = kidney; lgi = large intestine; liv = liver; lun = lung; meo = mesovarium; mgl = mammary gland; mix = lung and nasal cavity combined; myc = myocardium; nas = nasal cavity (includes tissues of the nose, nasal turbinates, paranasal sinuses and trachea); nrv = nervous system; orc = oral cavity (includes tissues of the mouth, oropharynx,

**pharynx, and larynx); ova = ovary; pan = pancreas; per = peritoneal cavity; pit = pituitary gland; pre = preputial gland; pro = prostate; ski = skin; smi = small intestine; spl = spleen; sto = stomach; sub = subcutaneous tissue; tba = all tumor bearing animals; tes = testes; thy = thyroid gland; ubl = urinary bladder; ute = uterus; vag = vagina; vsc = vascular system.**

**Superscripts give additional information about test results in the CPDB.**

| | | |
|---|---|---|
| i | = | Intraperitoneal or intravenous injection are the only routes of administration with positive tests in the CPDB. |
| m | = | More than one positive test in the species in the CPDB, and $TD_{50}$ values from each test are used in the calculation of the harmonic mean. |
| n | = | No results evaluated as positive for this species in the CPDB are statistically significant ($p<0.1$). |
| s | = | Species other than rats or mice are reported for this chemical in Tables B, C or D for hamsters, dogs or nonhuman primates |
| u | = | In these few cases the NTP-assigned level of evidence of carcinogenicity is "positive," noting that "these experiments were particularly difficult to evaluate based on the wording in the Technical Report Summaries". |
| v | = | Variation is greater than ten-fold among statistically significant (two-tailed $p<0.1$) $TD_{50}$ values from different positive experiments. |
| A | = | For aristolochic acid, kidney and urinary bladder were additional target sites in experiments that were too short to meet the inclusion rules of the CPDB. |
| H | = | A mix of carcinomas of the ear duct, Zymbal's gland, oral cavity and nasal cavity were combined by Maltoni *et al.* for the category "Head cancers", which are evaluated as a target site. |
| L | = | Female mouse strain was mammary tumor virus positive (MTV+) with a high spontaneous incidence of mammary tumors; histopathology was restricted to mammary gland. These studies were designed to measure tumor latency, and no author's opinion about carcinogenicity is given in the CPDB. |
| P | = | The harmonic mean of $TD_{50}$ for the species includes a value for the upper 99% confidence limit on $TD_{50}$ from an experiment with a target site with 100% tumor incidence in dosed animals. No $TD_{50}$ could be calculated for the site because only summary incidence data (not lifetable) were available. |
| < | = | For the only target site in the species, 100% of dosed animals had tumors. The value reported is the upper 99% confidence limit on $TD_{50}$; no $TD_{50}$ could be calculated because only summary data (not lifetable) were available. A $TD_{50}$ value would be less than the reported upper confidence limit. |