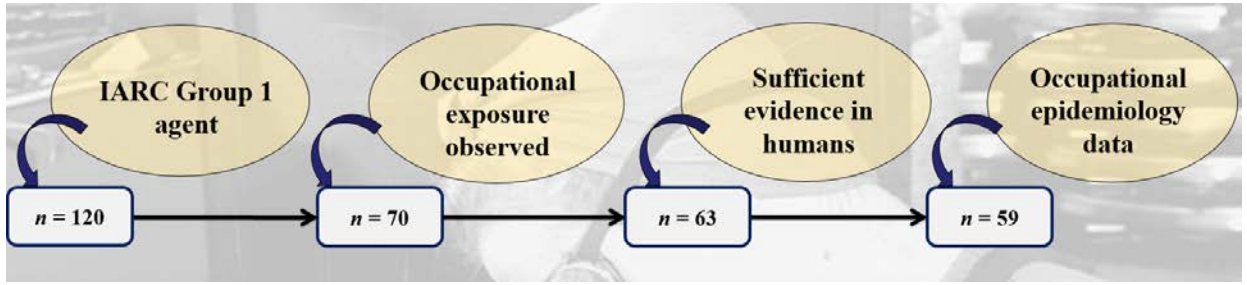
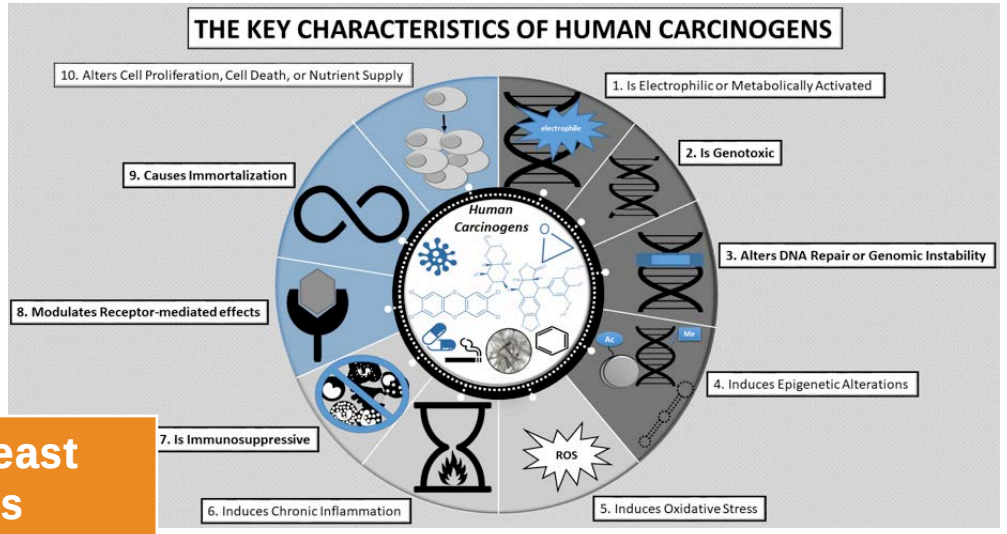
# Elucidating breast carcinogenicity: Observations from 50 years of IARC *Monographs*




After Loomis 2018; PMID:29769352




Guyton 2018 PMID:30521319; Smith 2020 PMID:32152214

| Known breast carcinogens (*sufficient* evidence in humans) | Known carcinogens with *sufficient* mammary cancer evidence in animals | Suspected breast carcinogens (*limited* evidence in humans) |
|---|---|---|
| Alcoholic beverages | Cyclophosphamide | Dieldrin |
| Diethylstilbestrol | Estrogen-progestogen contraceptives | Ethylene oxide |
| Estrogen-progestogen contraceptives | Estrogen menopausal therapy | Night shift work |
| Estrogen-progestogen menopausal therapy | Benzene | PCBs |
| X- & ɣ-radiation | Benzidine | Estrogen menopausal therapy |
| | 1,3-butadiene | Digoxin |
| | Vinyl chloride | Tobacco smoking |

- "Key characteristics of carcinogens" map well to suspected mechanisms of breast carcinogenicity
- Occupational studies may be crucial to identifying breast carcinogens
- Mechanistic evidence in occupationally exposed women can accelerate breast carcinogen identification for Group 2 and new agents (e.g., chlorpyrifos, fonofos, terbufos, methylene chloride, metalworking fluids)

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