The 10 Key Characteristics of Human Carcinogens

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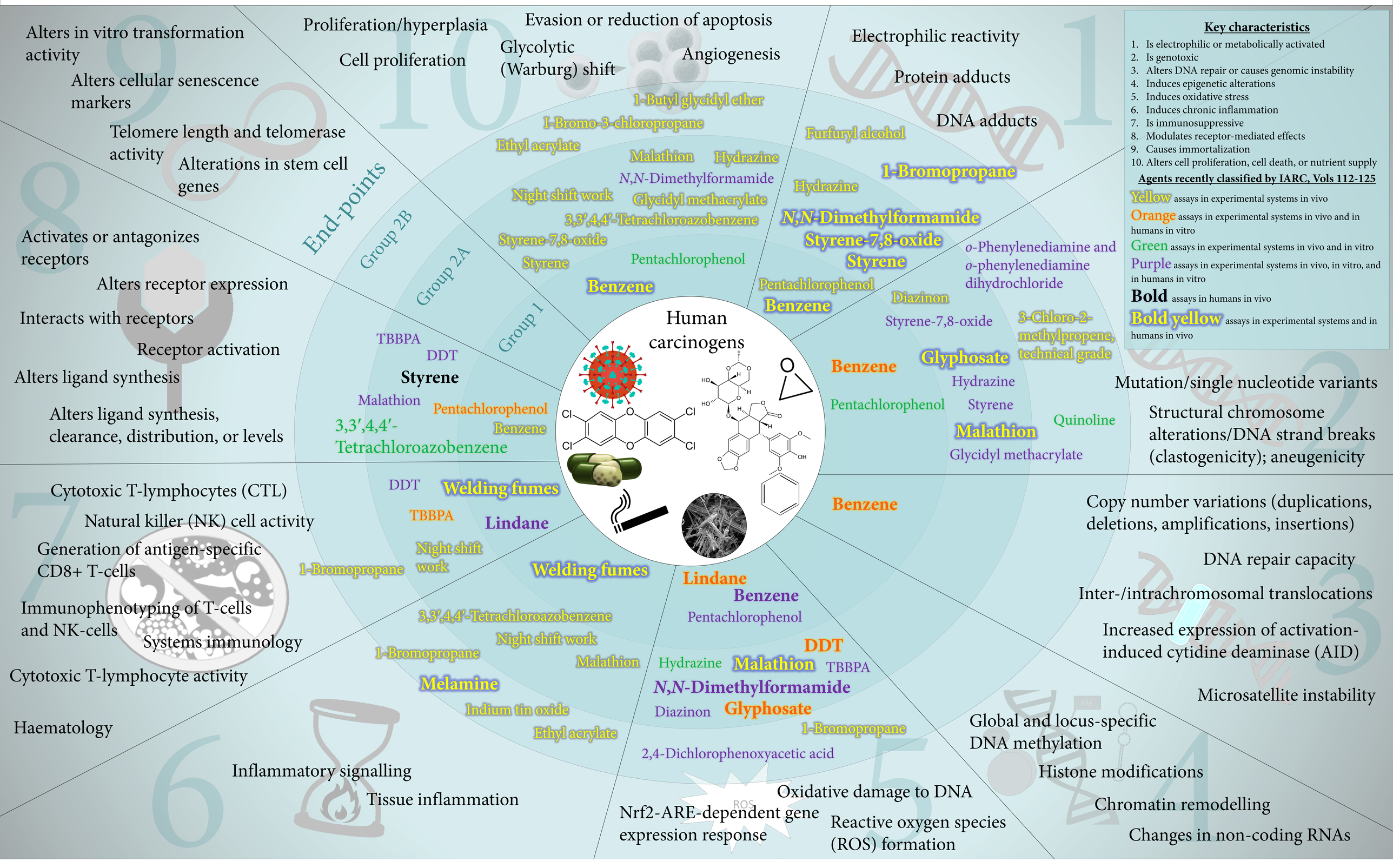

Key characteristics

1. Is electrophilic or metabolically activated
2. Is genotoxic
3. Alters DNA repair or causes genomic instability
4. Induces epigenetic alterations
5. Induces oxidative stress
6. Induces chronic inflammation
7. Is immunosuppressive
8. Modulates receptor-mediated effects
9. Causes immortalization
10. Alters cell proliferation, cell death, or nutrient supply

Agents recently classified by IARC, Vols 112-125

Yellow assays in experimental systems in vivo

Orange assays in experimental systems in vivo and in humans in vitro

Green assays in experimental systems in vivo and in vitro

Purple assays in experimental systems in vivo, in vitro, and in humans in vitro

Bold assays in humans in vivo

Bold yellow assays in experimental systems and in humans in vivo

International Agency for Research on Cancer

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Financial support

The authors gratefully acknowledge financial support from the US National Institutes of Health (U01 CA33193, KZG; NIEHS Superfund Research Program grant NIH P42ES004705, MTS), contract 17-E0023 from the Office of Environmental Health Hazard Assessment of California EPA (MTS), and the European Union Programme for Employment and Social Innovation "EaSI" (2014–2020) (KZG).

The authors declare the following competing financial interest(s): MTS has served as a consultant and expert witness in US litigation involving chemical and pharmaceutical exposures and various disease outcomes, including neuropathies and cancer.

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