



# DDT, LINDANE, AND 2,4-D

VOLUME 113

This publication represents the views and expert opinions of an IARC Working Group on the Evaluation of Carcinogenic Risks to Humans, which met in Lyon, 2–9 June 2015

LYON, FRANCE - 2018

IARC MONOGRAPHS  
ON THE EVALUATION  
OF CARCINOGENIC RISKS  
TO HUMANS

# LIST OF ABBREVIATIONS

---

2,4-D	2,4-dichlorophenoxyacetic acid
2,4-DB	4-(2,4-dichlorophenoxy)butyric acid
2,4-DCP	2,4-dichlorophenol
2,4,5-T	2,4,5-trichlorophenoxyacetic acid
8-OHdG	8-hydroxy-2'-deoxyguanosine
AAF	2-acetylaminofluorene
ACTH	adrenocorticotrophic hormone
ADI	acceptable daily intake
AHS	Agricultural Health Study
BMI	body mass index
bw	body weight
CHO	Chinese hamster ovary
CLL	chronic lymphocytic leukaemia
CYP	cytochrome P450
DDT	dichlorodiphenyltrichloroethane
DEET	<i>N,N</i> -diethyl- <i>meta</i> -toluamide
DHT	5 $\alpha$ -dihydroxytestosterone
dicamba	3,6-dichloro-2-methoxybenzoic acid
DoDSR	Department of Defense Serum Repository
E <sub>2</sub>	17 $\beta$ -estradiol
ECD	electron capture detector
EFSA	European Food Safety Authority
EGF	epidermal growth factor
EPA	United States Environmental Protection Agency
ER	estrogen receptor
EROD	ethoxyresorufin- <i>O</i> -deethylase
FAO	Food and Agriculture Organization of the United Nations
FXR	farnesoid X receptor
GC	gas chromatography
GC-ECD	gas chromatography-electron capture detector
GC-MS	gas chromatography-mass spectrometry
GC-MS-EI	gas chromatography-mass spectrometry-electron ionization
GCR	glucocorticoid receptor

GdCl <sub>3</sub>	gadolinium chloride
GM	geometric mean
HBsAg	hepatitis B surface antigen
HBV	hepatitis B virus
HCC	hepatocellular carcinoma
HCCH	hexachlorocyclohex-1-ene
HCH	hexachlorocyclohexane
HGPRT	hypoxanthine-guanine phosphoribosyl transferase
HRMS	high-resolution mass spectrometry
ILO	International Labour Organization
IP3	inositol 1,4,5-triphosphate
IQR	interquartile range
JECFA	Joint FAO/WHO Expert Committee on Food Additives
LD <sub>50</sub>	median lethal dose
LH	luteinizing hormone
LOD	limit of detection
MCPA	2-methyl-4-chlorophenoxyacetic acid
MCPP	mecoprop or methylchlorophenoxypropionic acid
meta-RR	meta relative risk
MHCI $\alpha$	$\alpha$ -cardiac-like myosin heavy chain
MHCII $\alpha$	myosin heavy chain gene II $\alpha$
MRL	maximum residue level
MS	mass spectrometry
MTT	3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide
Mx	MX dynamin-like GTPase
NAC	<i>N</i> -acetyl- <i>L</i> -cysteine
ND	not detected
NDMA- <i>d</i>	<i>N</i> -nitrosodimethylamine demethylase
NF- $\kappa\beta$	nuclear factor kappa $\beta$
NIOSH	United States National Institute for Occupational Safety and Health
NK	natural killer
NOAEL	no-observed-adverse-effect level
NR	not reported
NT	not tested
OAT1	organic anion transporter 1
OCP	organochlorine pesticide
OR	odds ratio
PCB	polychlorinated biphenyl
PCCH	pentachlorocyclohex-1-ene
PGD2	prostaglandin D2
PGE2	prostaglandin E2
PGF2 $\alpha$	prostaglandin F2 $\alpha$
PI	phosphatidylinositol
PIP	phosphatidylinositol 4-phosphate
PIP2	phosphatidylinositol 4,5-bisphosphate
PM <sub>2.5</sub>	particulate matter with aerodynamic diameter $\leq 2.5 \mu\text{m}$
PM <sub>10</sub>	particulate matter with aerodynamic diameter $\leq 10 \mu\text{m}$
PPAR	peroxisome proliferator-activated receptor
ppb	parts per billion
ppm	parts per million

---

PROD	7-pentoxoresorufin- <i>O</i> -dealkylase
PSA	prostate-specific antigen
PXR	pregnane X receptor
ROS	reactive oxygen species
SD	standard deviation
SEER	Surveillance, Epidemiology and End Results Program
SHBG	sex hormone-binding globulin
SIR	standardized incidence ratio
SMR	standardized mortality ratio
T3	triiodothyronine
T4	thyroxine
TCDD	2,3,7,8-tetrachlorodibenzo- <i>p</i> -dioxin
TCP	trichlorophenol
TMDI	theoretical maximum daily intake
TNF $\alpha$	tumour necrosis factor $\alpha$
ToxCast <sup>™</sup>	Toxicity Forecaster
ToxPi	toxicological prioritization index
TPA	12- <i>O</i> -tetradecanoyl phorbol-13-acetate
TSH	thyroid-stimulating hormone
USA	United States of America
WHO	World Health Organization
w/w	weight per weight
ww	wet weight
vs	versus