



**NON-IONIZING RADIATION,
PART 2: RADIOFREQUENCY
ELECTROMAGNETIC FIELDS**

VOLUME 102

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, 24-31 May 2011

LYON, FRANCE - 2013

**IARC MONOGRAPHS
ON THE EVALUATION
OF CARCINOGENIC RISKS
TO HUMANS**

LIST OF ABBREVIATIONS

AMPS	advanced mobile phone system
CMB	cosmic microwave background
CDMA	code-division multiple access
CW	continuous wave
DAB	digital audio broadcasting
D-AMPS	digital advanced mobile phone system
DECT	digital enhanced cordless telecommunications
DCS	Digital Cellular System
DMH	dimethylhydrazine
DTX	discontinuous transmission
EIRP	equivalent isotropically radiated power
EMF	electromagnetic field
ENU	<i>N</i> -ethyl- <i>N</i> -nitrosourea
ERP	effective radiated power
FDD	frequency-division duplex
FDMA	frequency-division multiple access
FDTD	finite-difference time-domain
FEM	finite-element method
GPRS	general packet radio service
GSH-Px	glutathione peroxidase
GSM	Global System for Mobile communications
HAN	home area network
HF	high frequency
ICNIRP	International Council on Non-Ionizing Radiation Protection
iDEN	integrated Digital Enhanced Network
IRP	spherically-integrated radiated power
ISM	industrial, scientific and medical
LAN	local area network
LF	low frequency
LPS	lipopolysaccharide
LTE	long-term evolution
MF	medium frequency
MoM	method of moment
MPE	maximum permissible exposures
MRI	magnetic resonance imaging

MX	3-chloro-4-(dichloromethyl)-5-hydroxy-2(5H)-furanone
NAC	<i>N</i> -acetyl cysteine
NO	nitric oxide
ODC	ornithine decarboxylase
OFDM	orthogonal frequency-division multiplexing
PCI	peripheral component interconnect
PDC	personal digital cellular
PHA	phytohaemagglutinin
PMA	phorbol 12-myristate 13-acetate
PMR	private mobile radio
PTT	push-to-talk
pps	pulses per second
PVC	polyvinyl chloride
PW	pulsed wave
MMC	mitomycin C
NMT	Nordic Mobile Telephony
RF	radiofrequency
ROS	reactive oxygen species
RTL	radial transmission line
RT-PCR	reverse-transcriptase polymerase chain reaction
SAM	specific anthropometric mannequin
SAR	specific absorption rate
SD	standard deviation
SMS	short message service
SOD	superoxide dismutase
TAC	total antioxidant capacity
TACS	total-access communication systems
TCSE	total cumulative specific energy
TDMA	time-division multiple access
TEM	transverse electromagnetic
TETRA	Terrestrial Trunked Radio
TNF	tumour necrosis factor
TPA	12- <i>O</i> -tetradecanoylphorbol-13-acetate
UMTS	Universal Mobile Telecommunications System
<i>vs</i>	<i>versus</i>
WCDMA	wideband code-division multiple access
Wi-Fi	standard wireless local area network (WLAN) technology
WiMax	worldwide interoperability for microwave access
WLAN	wireless local area network
XO	xanthine oxidase