

IARC Handbooks of Cancer Prevention Primary preventive agents and activities

Agents (CAS Registry No.)	Volume (year)	Evidence for cancer-preventive effect		Overall evaluation, or evidence	Organ site(s)
		Humans	Animals		
Aspirin (50-78-2)	1 (1997)	Limited	Sufficient	Limited	Colon, rectum
Indomethacin (53-86-1)	1 (1997)	Inadequate	Sufficient	Inadequate	
				<i>Familial adenomatous polyposis: limited^a</i>	
Piroxicam (36322-90-4)	1 (1997)	Inadequate	Sufficient	Inadequate	
Sulindac (38194-50-2)	1 (1997)	Inadequate <i>Familial adenomatous polyposis: limited</i>	Sufficient	Inadequate	
				<i>Familial adenomatous polyposis: limited^a</i>	Colon, rectum
Beta-Carotene (7235-40-7)	2 (1998)	<i>Dietary levels: inadequate</i> <i>High doses: evidence suggesting lack of cancer-preventive effect</i>	Sufficient	Inadequate ^b	
Alpha-Carotene (7488-99-5)	2 (1998)	Inadequate	Limited	Inadequate	
Lycopene (502-68-5)	2 (1998)	Inadequate	Limited	Inadequate	
β-Cryptoxanthin (472-70-8)	2 (1998)	Inadequate	No data	Inadequate	
Canthaxanthin (514-78-3)	2 (1998)	No data	Sufficient	Inadequate	
Fucoxanthin (3351-86-8)	2 (1998)	Inadequate	Limited	Inadequate	
Lutein (127-40-2)	2 (1998)	Inadequate	Limited	Inadequate	
Zeaxanthin (144-68-3, 29472-68-2)	2 (1998)	Inadequate	No data	Inadequate	
Vitamin A compounds: Retinol (68-26-8) Retinyl acetate (127-47-9) Retinyl palmitate (79-81-2) Retinal (116-31-4)	3 (1998)	<i>Preformed vitamin A: evidence suggesting lack of cancer-preventive effect</i>	Limited	<i>Preformed vitamin A: evidence suggesting lack of cancer-preventive effect^c</i>	Upper aerodigestive tract, stomach, colon, rectum, lung, breast (postmenopausal), prostate, bladder

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All- <i>trans</i> -retinoic acid (302-79-4)	4 (1999)	Inadequate	Inadequate	Inadequate	
13- <i>cis</i> -Retinoic acid (4759-48-2)	4 (1999)	Limited	Limited	Limited	Oral cavity, aerodigestive tract (second primary)
9- <i>cis</i> -Retinoic acid (5300-03-8)	4 (1999)	Inadequate	Limited	Inadequate	
4-Hydroxyphenyl-retinamide (65646-68-6)	4 (1999)	Inadequate	Sufficient	Limited ^{d, e}	
Etretinate (54350-48-0)	4 (1999)	Inadequate	Limited	Inadequate	
Acitretin (160024-33-9)	4 (1999)	Inadequate	Inadequate	Inadequate	
<i>N</i> -Ethylretinamide (33631-41-3)	4 (1999)	Inadequate	ESLE	Inadequate	
Targretin (153559-49-0)	4 (1999)	Inadequate	Inadequate	Inadequate	
LGD 1550 (178600-20-9)	4 (1999)	Inadequate	Inadequate	Inadequate	
Sunscreens	5 (2001)	Limited	Sufficient	Limited	Skin (squamous cell carcinoma)
Weight control - see "Absence of excess body fatness"					
Regular physical activity	6 (2002)	Sufficient		Cancer-preventive effect	Colon, breast (sufficient) Corpus uteri, prostate (limited)
Fruit and vegetables	8 (2003)	Limited	Sufficient	Cancer-preventive effect ^e	Mouth and pharynx, larynx, oesophagus, stomach, colorectum, lung, kidney
- Fruit	8 (2003)			Probable cancer-preventive effect	Oesophagus, stomach, lung
				Possible cancer-preventive effect	Mouth, pharynx, larynx, colorectum, kidney, urinary bladder
- Vegetables	8 (2003)			Probable cancer-preventive effect	Oesophagus, colorectum
				Possible cancer-preventive effect	Mouth, pharynx, larynx, stomach, lung, ovary, kidney
Cruciferous vegetables	9 (2004)	Limited	Sufficient	Probable cancer-preventive effect ^e	Stomach, lung

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- Isothiocyanates		Inadequate			
- Indoles		Inadequate			
- Phenethyl isothiocyanate			Sufficient		
- Benzylisothiocyanate			Sufficient		
- 3-Phenylpropylisothiocyanate			Sufficient		
- Indole-3-carbinol			Sufficient		
- 3,3'-Diindolylmethane			Sufficient		
- Glucosinolates			Limited		
- Sulforaphane			Limited		
Absence of excess body fatness	16 (2018)	Sufficient	Sufficient	Cancer-preventive effect	Colon and rectum, oesophagus (adenocarcinoma), stomach (gastric cardia), liver (hepatocellular carcinoma), gall bladder, pancreas, breast (postmenopausal), endometrium, ovary, kidney (renal cell carcinoma), thyroid, meningioma, multiple myeloma

ESLE, evidence suggesting lack of effect

The wordings of the evaluation read as follows:

- a "Some evidence"
- b "Conflicting evidence"
- c "Little evidence"
- d "Shows promise as cancer-preventive agent"
- e With supporting evidence from mechanistic data
- f "Indicative evidence"

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