

## 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<sup>a</sup></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<sup>a</sup></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 <sup>b</sup>	
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)	3 (1998)	<i>Preformed vitamin A: evidence suggesting lack</i>	Limited	<i>Preformed vitamin A: evidence suggesting lack</i>	Upper aerodigestive tract, stomach, colon, rectum, lung, breast (postmenopausal), prostate, bladder

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Retinyl palmitate (79-81-2) Retinal (116-31-4)		of cancer-preventive effect		of cancer-preventive effect <sup>c</sup>	
All-trans-retinoic acid (302-79-4)	4 (1999)	Inadequate	Inadequate	Inadequate	
13-cis-Retinoic acid (4759-48-2)	4 (1999)	Limited	Limited	Limited	Oral cavity, aerodigestive tract (second primary)
9-cis-Retinoic acid (5300-03-8)	4 (1999)	Inadequate	Limited	Inadequate	
4-Hydroxyphenyl-retinamide (65646-68-6)	4 (1999)	Inadequate	Sufficient	Limited <sup>d,e</sup>	
Etretinate (54350-48-0)	4 (1999)	Inadequate	Limited	Inadequate	
Acitretin (160024-33-9)	4 (1999)	Inadequate	Inadequate	Inadequate	
N-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"					
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 <sup>e</sup>	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

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Cruciferous vegetables	9 (2004)	Limited	Sufficient	Probable cancer-preventive effect <sup>e</sup>	Stomach, lung
- 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 (in prep.)	Sufficient	Sufficient	Cancer-preventive effect	Oesophagus (adenocarcinoma), stomach (gastric cardia), colon and rectum, liver, gallbladder, pancreas, breast (postmenopausal), corpus uteri, ovary, kidney (renal-cell), meningioma, thyroid, multiple myeloma

ESLE, evidence suggesting lack of effect

The wordings of the evaluation read as follows:

<sup>a</sup> "Some evidence"

<sup>b</sup> "Conflicting evidence"

<sup>c</sup> "Little evidence"

<sup>d</sup> "Shows promise as cancer-preventive agent"

<sup>e</sup> With supporting evidence from mechanistic data

<sup>f</sup> "Indicative evidence"

Last updated 13 June 2018