

Tumor markers

Tumor markers (*tumor markers*, TM) are **laboratory detectable** marks from which the tumor growth unwound (Proto-oncogenes, oncogenes, anti-oncogenes) or a malignancy which manifests itself (tumor antigens, tumor cells or products of the reactive products of non-tumor cells).^{[1][2]}

- in the narrower (clinical) sense of the word substances that can be **determined** in blood, urine or tissue and have a higher value in cancer
- use** to refine diagnosis, monitor the course of therapy and detect early relapse
- they can also be elevated by non-tumor causes
- are not used as nationwide screening, only the PSA is used for screening of patients at risk for Ca prostate
- they can be **produced** directly by tumor cells or non-tumor cells in response to the presence of a tumor
- if the TM examination is performed at the appropriate choice and at reasonable intervals, it can be a good helper for the attending physician - determining the response to treatment, disease progression and the patient's prognosis
- tumor markers can be divided according to the site of production, specificity, chemical structure and biological character ^{[3][4]}

Tumor-specific tumor markers

- associated with the presence of certain tumor tissue
- due to the considerable overlap of TM production in different tumor tissues, the specificity is low
- suitable for **monitoring remission of cancer and early diagnosis of disease relapse**:
 - eg CEA (Ca GITu), CA 19-9 (Pancreatic Cancer), CA 125 (ovarian cancer), etc.

Tissue-specific tumor markers

- rather related to a certain tissue in which a pathological event may take place (eg tumor growth)
- often increased from non-tumor causes (eg PSA in men - prostate; hCG a AFP – germinal liver tissue)^{[5][6]}

Humoral

Abbreviation	Name	Physiologically produced	Standard	Increased at	False positivity	Note
CEA	carcinoembryonic antigen	epithelial cells during fetal development	<3 µg/l	ca colorectal, breast carcinoma, lung cancer, ovarian cancer, liver metastases,	Cirrhosis, GIT inflammation	
AFP	α-fetoprotein	yolk sac and fetal liver	<10 µg/l	cirrhosis, active hepatitis, nonseminomas, Germinal tumors (teratoma), hepatocellular carcinoma, hepatolastoma	pregnancy	
CA 15-3	Carcinoma antigen 15-3			breast carcinoma, GIT tumors, glandular epithelial tumors	hepatopathy, cholangitis, lung disease, renal disorders, pregnancy	↑ breast carcinoma – sensitivity 75%, specificity 90%, some GIT tumors
MCA	mucinous carcinoma antigen			breast carcinoma		rise earlier than CA 15-3, use for confirmation at elevated CA 15-3
CA 19-9	carbohydrate antigen			Pancreatic Cancer, stomach cancer, ca colorectal, breast carcinoma	obstructive jaundice	
CA 72-4	carbohydrate antigen			stomach cancer, esophageal cancer, lung cancer, ovarian cancer		
					benign ovarian and endometrial conditions,	monitoring of ovarian ca treatment,

CA 125	carbohydrate antigen			ovarian cancer	hepatopathy, pancreatitis, pregnancy, menstruation	screening in women with ovarian ca in family history
SCC	squamous cell carcinoma antigen			squamous cell carcinomas		
TPA/S	tissue polypeptide antigen	cell proliferation		various cancers (cancer of the bladder, head and neck)		mixture of about 20 cytokeratins, increases in proportion to the growing tumor
CYFRA 21-1	cytokeratin fragments 19			non-small cell lung cancer		
PSA	prostate specific antigen	into the seminal vesicle fluid to liquefy ejaculate by prostate cells	<2,5 µg/l < 50 let <5 µg/l 50-60 let 8,5 < µg/l > 60 let	Ca prostate	ejaculation, per rectum examination before collection, BPH	values above 10 µg/l - 50% ca risk, about 20 % ca prostate has PSA in the norm
LD	lactate dehydrogenase	liver, myocardium, skeletal muscles, erythrocytes	4,10 µkat/l	testicular tumors, leukemia, RCC, Hodgkin's lymphoma		
ALP	alkaline phosphatase			sarcoma, Prostatic Carcinoma	bile duct obstruction	
ACP	acid phosphatase			skeletal metastases, Prostatic Carcinoma		
GGT	γ-glutamyltransferase			metastatic liver disease	alcoholics, bile duct obstruction	
NSE	neuron specifická enoláza			neuroblastoma, retinoblastoma, malignant melanoma, SCLC	hemolysis	in CNS tumors better determined in cerebrospinal fluid
TK	thymidine kinase			leukemia, lymphoma, non-small cell lung ca.		DNA replacement synthesis route
hCG	human chorionic gonadotropin	placenta		trophoblast tumors, choriokarcinoma (100% sensitivity), germinal tumors of the testes and ovaries	pregnancy	screening of endangered persons, examination of the β-subunit
PRL	prolactin	during pregnancy and after childbirth		prolactinoma, MEN I	slightly during physical exertion, mental stress	
CT	calcitonin			medullary thyroid carcinoma		
Thyreoglobulin	thyreoglobulin			follicular carcinoma of the thyroid gland		
Ferritin	ferritin			multiple myeloma, AML, Hodgkin's lymphoma		
β2 microglobulin	β2 microglobulin			CLL, multiple myeloma, lymphomas		
Paraprotein	paraprotein			multiple myeloma		Bence-Jones protein
VMA	vanillic acid	catecholamine degradation product		functional tumors of the adrenal glands		determination in urine, or determination of metanephrines (plasma, urinary)
HIAA	5-hydroxyindoleacetic acid	serotonin degradation product		functional karcinoids		determination in urine

Cell markers

Abbreviation	Name	Physiologically produced	Standard	Increased at	False positivity	Note
HER2/neu				breast cancer		target for monoclonal antibodies (Herceptin), increased expression = worse prognosis

Genetic markers

Abbreviation	Name	Physiologically produced	Standard	Increased at	False positivity	Note
p53	<i>genome guardian</i>	cell cycle regulation		Li-Fraumeni syndrome, sarcomas, breast cancer		
BRCA1/2	breast cancer			breast and ovarian cancer		

References

References

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Kategorie:Patobiochemie Kategorie:Vnitřní lékařství Kategorie:Chirurgie Kategorie:Onkologie Kategorie:Klinická biochemie