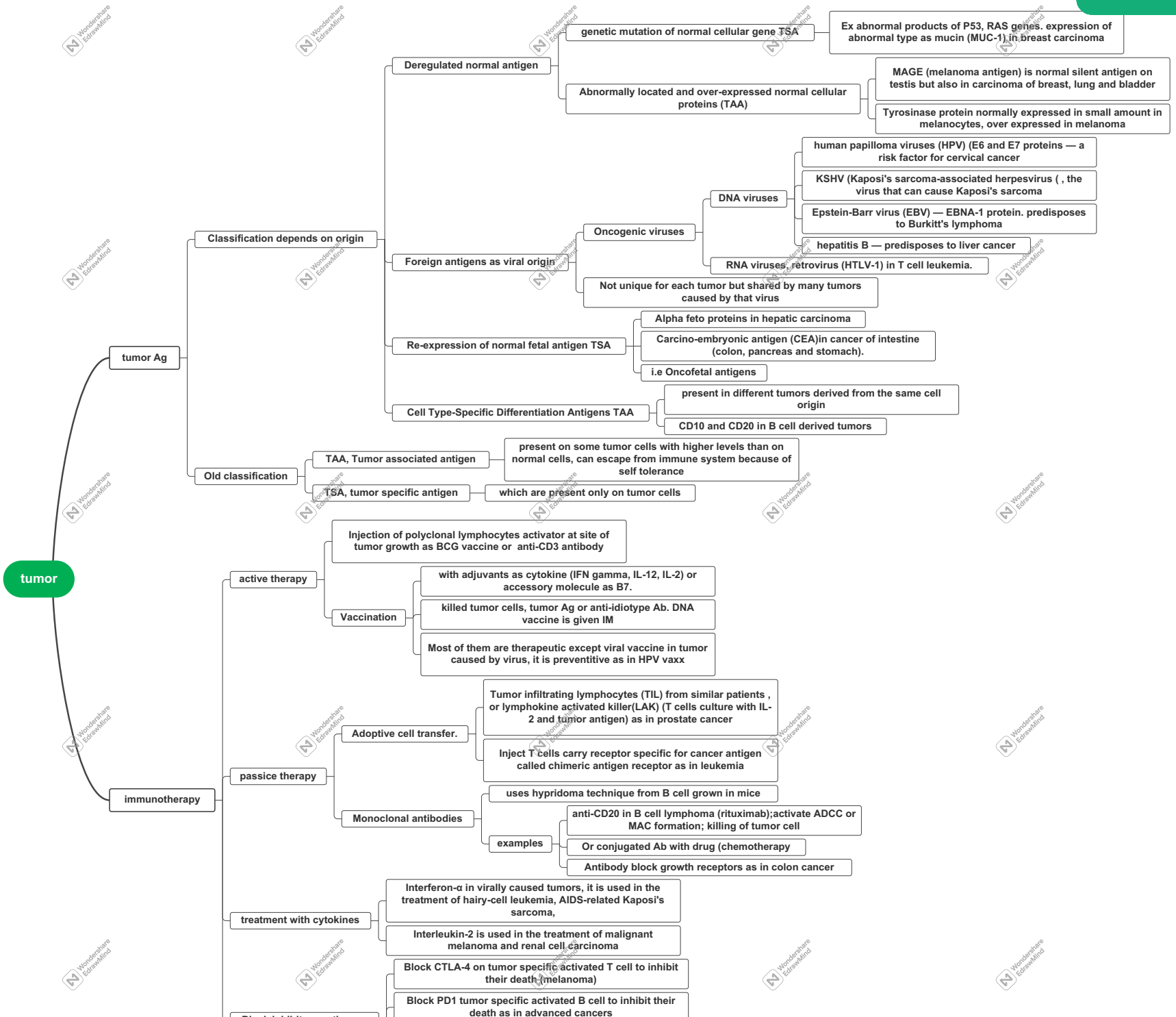
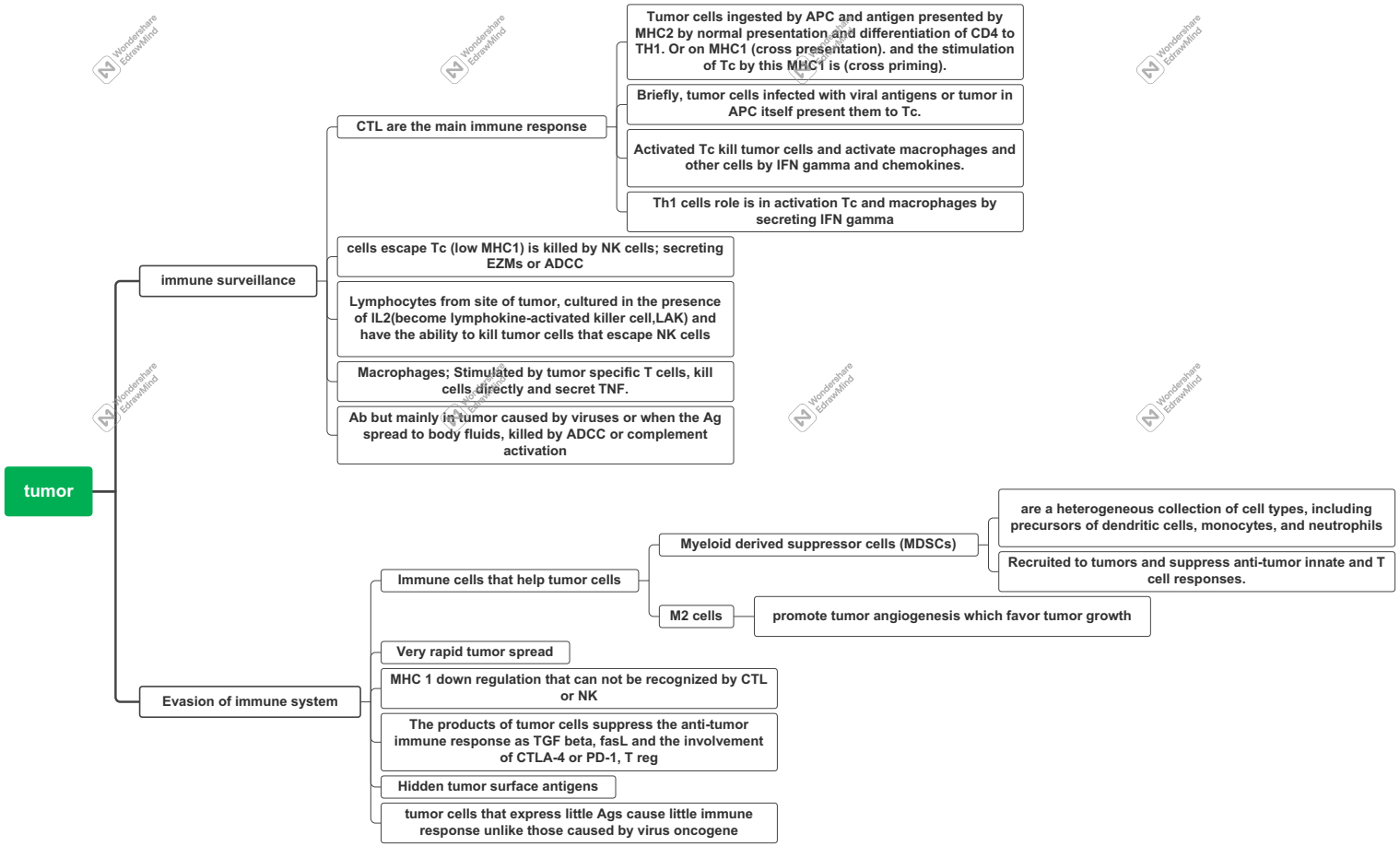

tumor
tumor Ag
Classification depends on origin
Deregulated normal antigen
genetic mutation of normal cellular gene TSA
Ex abnormal products of P53, RAS genes. expression of abnormal type as mucin (MUC-1) in breast carcinoma
Abnormally located and over-expressed normal cellular proteins (TAA)
MAGE (melanoma antigen) is normal silent antigen on testis but also in carcinoma of breast, lung and bladder
Tyrosinase protein normally expressed in small amount in melanocytes, over expressed in melanoma
Foreign antigens as viral origin
Oncogenic viruses
DNA viruses
human papilloma viruses (HPV) (E6 and E7 proteins — a risk factor for cervical cancer
KSHV (Kaposi's sarcoma-associated herpesvirus (, the virus that can cause Kaposi's sarcoma
Epstein-Barr virus (EBV) — EBNA-1 protein. predisposes to Burkitt's lymphoma
hepatitis B — predisposes to liver cancer
RNA viruses retrovirus (HTLV-1) in T cell leukemia.
Not unique for each tumor but shared by many tumors caused by that virus
Re-expression of normal fetal antigen TSA
Alpha feto proteins in hepatic carcinoma
Carcino-embryonic antigen (CEA)in cancer of intestine (colon, pancreas and stomach).
i.e Oncofetal antigens
Cell Type-Specific Differentiation Antigens TAA
present in different tumors derived from the same cell origin
CD10 and CD20 in B cell derived tumors
Old classification
TAA, Tumor associated antigen
present on some tumor cells with higher levels than on normal cells, can escape from immune system because of self tolerance
TSA, tumor specific antigen
which are present only on tumor cells
immunotherapy
active therapy
Injection of polyclonal lymphocytes activator at site of tumor growth as BCG vaccine or anti-CD3 antibody
Vaccination
with adjuvants as cytokine (IFN gamma, IL-12, IL-2) or accessory molecule as B7.
killed tumor cells, tumor Ag or anti-idiotype Ab. DNA vaccine is given IM
Most of them are therapeutic except viral vaccine in tumor caused by virus, it is preventitive as in HPV vaxx
passice therapy
Adoptive cell transfer.
Tumor infiltrating lymphocytes (TIL) from similar patients , or lymphokine activated killer(LAK) (T cells culture with IL-2 and tumor antigen) as in prostate cancer
Inject T cells carry receptor specific for cancer antigen called chimeric antigen receptor as in leukemia
Monoclonal antibodies
uses hypridoma technique from B cell grown in mice
examples
anti-CD20 in B cell lymphoma (rituximab);activate ADCC or MAC formation; killing of tumor cell
Or conjugated Ab with drug (chemotherapy
Antibody block growth receptors as in colon cancer
treatment with cytokines
Interferon-α in virally caused tumors, it is used in the treatment of hairy-cell leukemia, AIDS-related Kaposi's sarcoma,
Interleukin-2 is used in the treatment of malignant melanoma and renal cell carcinoma
Block CTLA-4 on tumor specific activated T cell to inhibit their death (melanoma)
Block PD1 tumor specific activated B cell to inhibit their death as in advanced cancers


tumor
immune surveillance
CTL are the main immune response
Tumor cells ingested by APC and antigen presented by MHC2 by normal presentation and differentiation of CD4 to TH1. Or on MHC1 (cross presentation). and the stimulation of Tc by this MHC1 is (cross priming).
Briefly, tumor cells infected with viral antigens or tumor in APC itself present them to Tc.
Activated Tc kill tumor cells and activate macrophages and other cells by IFN gamma and chemokines.
Th1 cells role is in activation Tc and macrophages by secreting IFN gamma
cells escape Tc (low MHC1) is killed by NK cells; secreting EZMs or ADCC
Lymphocytes from site of tumor, cultured in the presence of IL2(become lymphokine-activated killer cell,LAK) and have the ability to kill tumor cells that escape NK cells
Macrophages; Stimulated by tumor specific T cells, kill cells directly and secret TNF.
Ab but mainly in tumor caused by viruses or when the Ag spread to body fluids, killed by ADCC or complement activation
Evasion of immune system
Immune cells that help tumor cells
Myeloid derived suppressor cells (MDSCs)
are a heterogeneous collection of cell types, including precursors of dendritic cells, monocytes, and neutrophils
Recruited to tumors and suppress anti-tumor innate and T cell responses.
M2 cells
promote tumor angiogenesis which favor tumor growth
Very rapid tumor spread
MHC 1 down regulation that can not be recognized by CTL or NK
The products of tumor cells suppress the anti-tumor immune response as TGF beta, fasL and the involvement of CTLA-4 or PD-1, T reg
Hidden tumor surface antigens
tumor cells that express little Ags cause little immune response unlike those caused by virus oncogene