Immune System- Overview

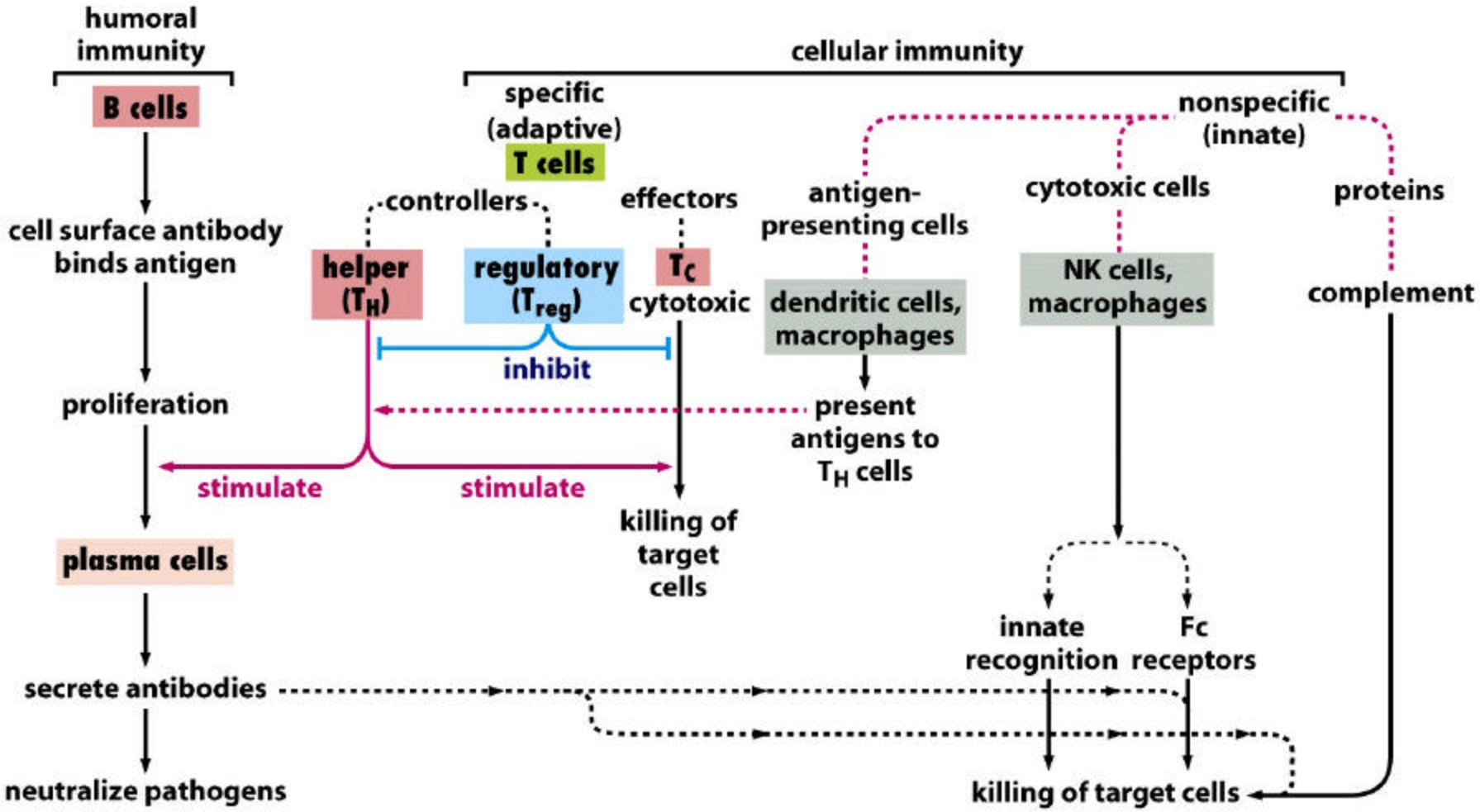

Figure 15-14 The Biology of Cancer (© Garland Science 2007)

Cancer Incidence in Immunosuppressed transplant patients

Table 15.1 Cancer incidence in immunosuppressed transplant patients[a]

Site of cancer	No. of cases observed	No. of cases expected[b]	Ratio observed/expected
Non-melanoma skin	127	5.1	24.7
Thyroid, other endocrine	30	2.1	14.3
Mouth, tongue, lip	22	1.6	13.8
Cervix, vulva, vagina	39	3.6	10.8
Non-Hodgkin's lymphoma	25	2.4	10.3
Kidney, ureter	32	3.5	9.1
Bladder	26	4.7	5.5
Colorectal	38	10.5	3.6
Lung	30	12.5	2.4
Brain	10	4.1	2.4
Prostate	11	5.2	2.1
Melanoma	7	4.1	1.7
Breast	15	13.6	1.1

[a]Data from S.A Birkeland, H.H. Storm, L.U. Lamm et al., *Int. J. Cancer* 60:183–189, 1995, as adapted by J. Peto, *Nature* 411:390–395, 2001.
[b]These numbers represent the numbers of cases of the various cancers expected to occur in an age-matched control population over the same period of time.

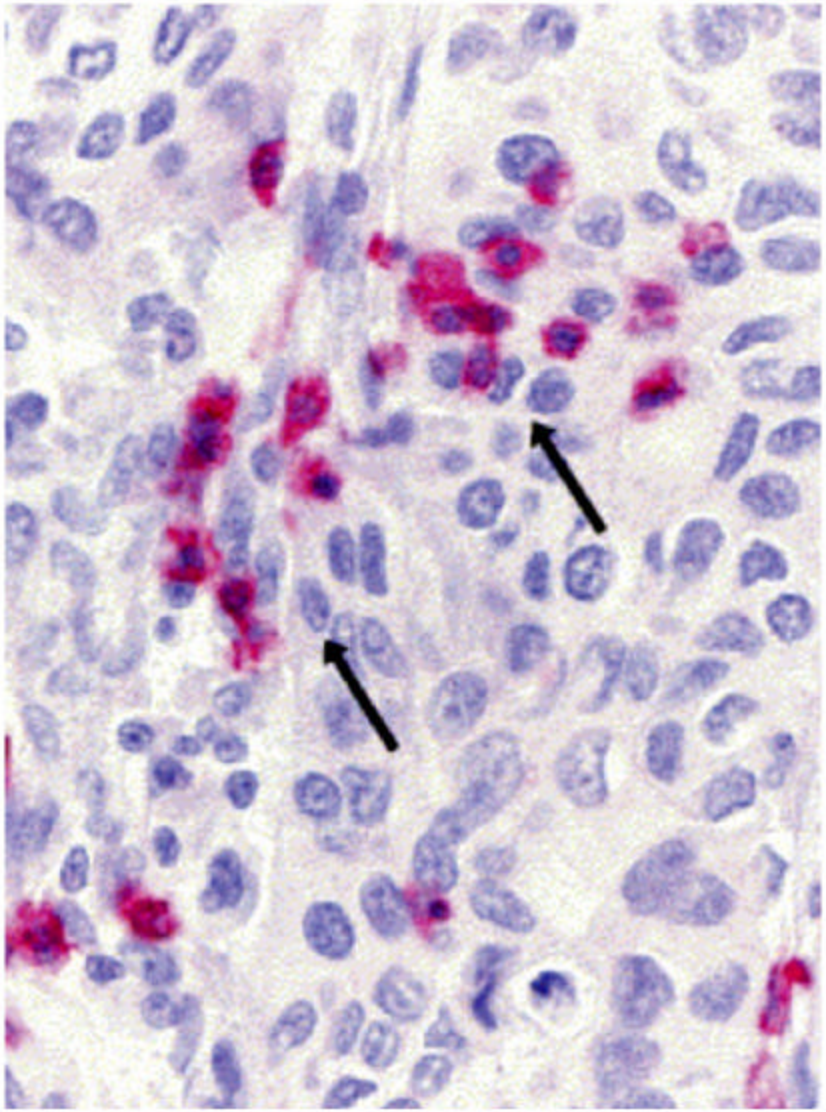

Figure 15-21c The Biology of Cancer (© Garland Science 2007)

- TILs in non-small cell lung carcinoma- expression of CD8 antigen (dark pink) shows that cells are T_C cells

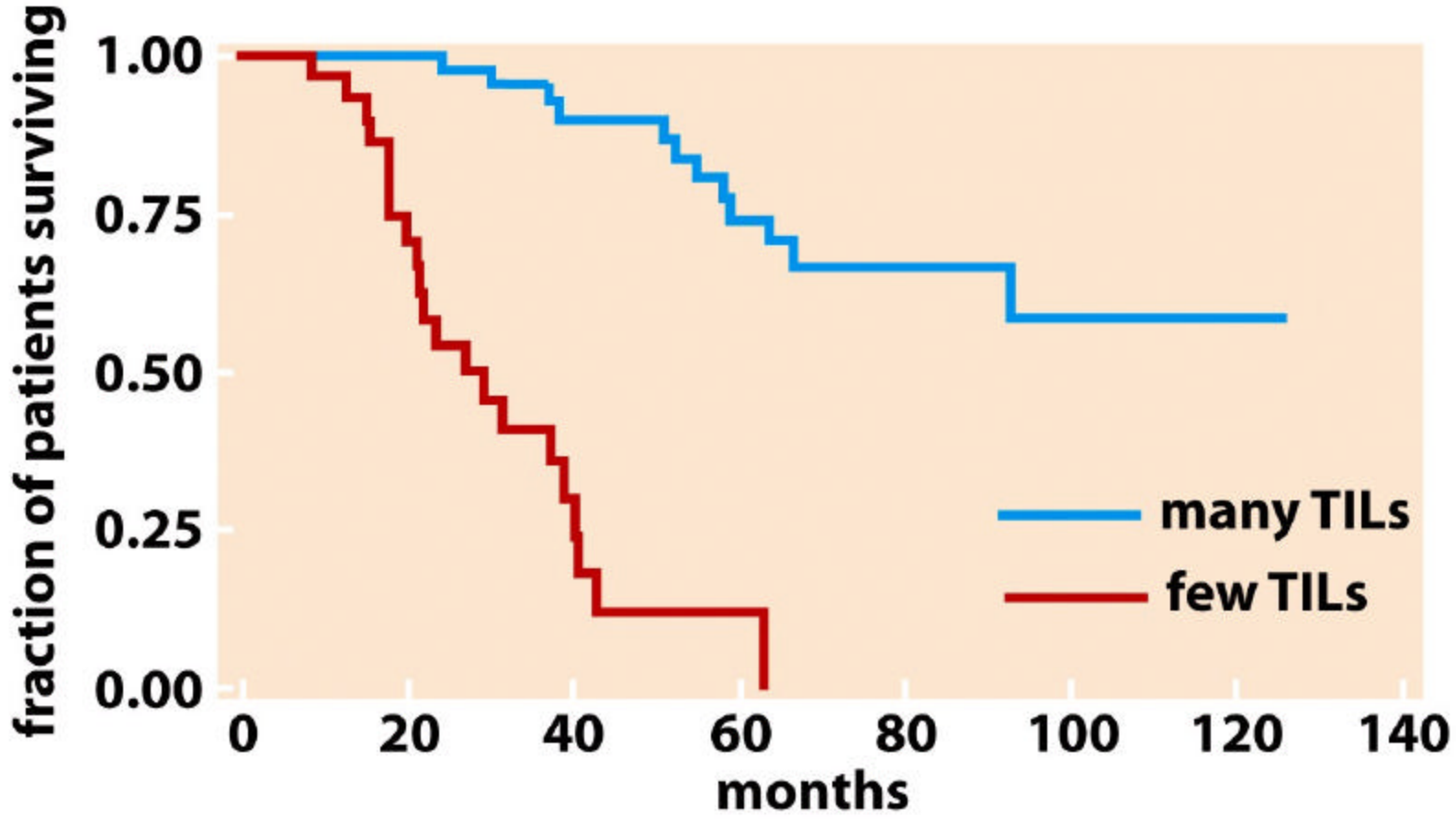

Figure 15-21d The Biology of Cancer (© Garland Science 2007)

- The more TILs in tumor the greater the months of survival

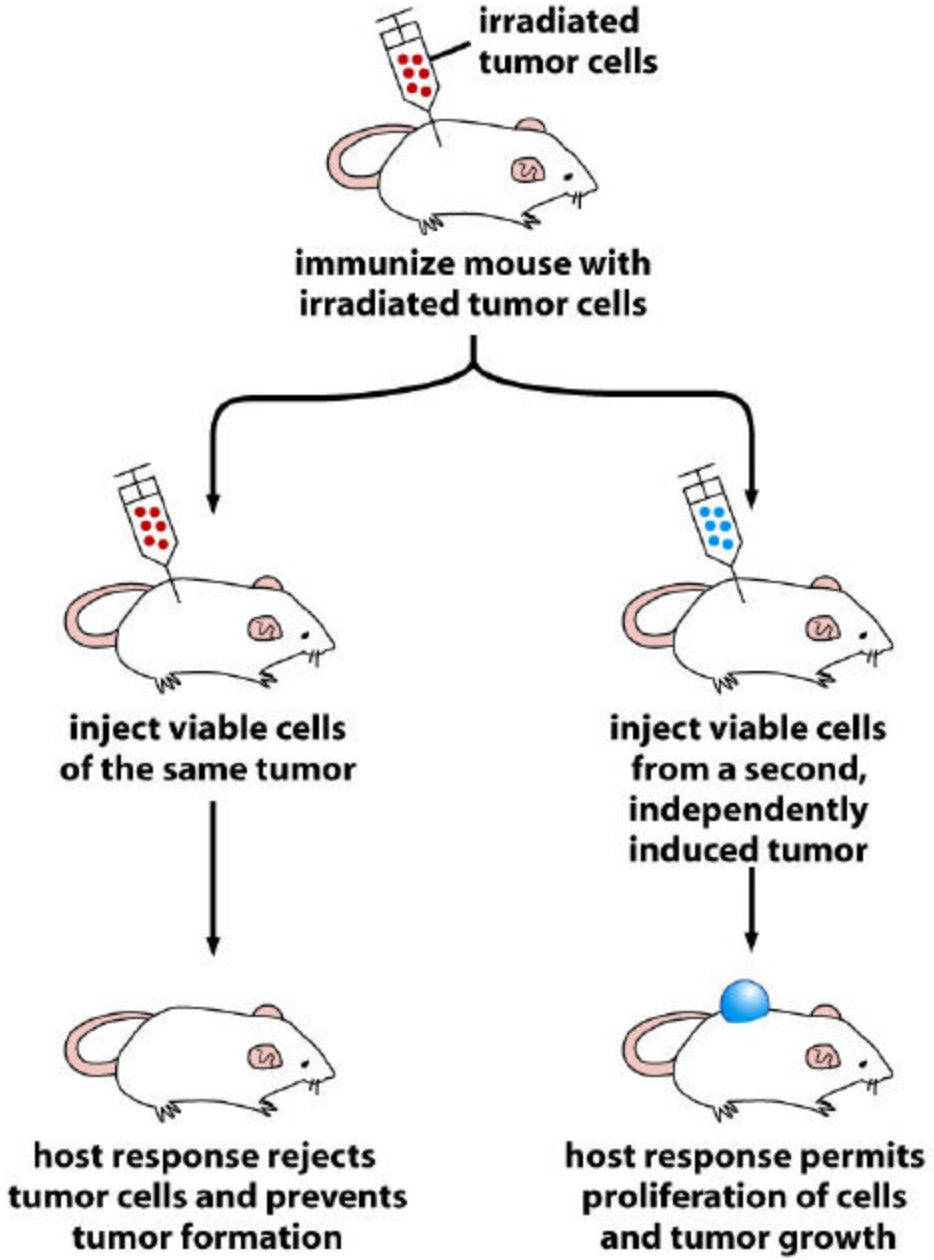

Figure 15-17 The Biology of Cancer (© Garland Science 2007)

- Immunization with cancer cells
- Demonstrated also by partial excision/ or excision of tumor cells and injection of same tumor at different site

Table 15.3 Immunoevasive strategies used by cancer cells

Strategy	Mechanism	Agent being evaded
Hide identity	repress tumor antigens (TATA or TSTA), repress MHC class I proteins	cytotoxic T lymphocytes
Hide stress	repress NKG2D ligands (e.g., MICA)	NK cells
Inactivate immunocytes	destroy immunocyte receptors	NK cells; cytotoxic T lymphocytes
	saturate immunocyte receptors with adenosine, MICA	NK cells; variety of immunocytes
Avoid apoptosis	inhibit caspase cascade by increasing IAPs, acquire resistance to FasL-mediated apoptosis	
Induce immunocyte apoptosis	release soluble FasL	cytotoxic T lymphocytes
	release cytokines (IL-10, TGF-β)	cytotoxic T lymphocytes, dendritic cells, macrophages
Neutralize intracellular toxins	enzymatic detoxification of H_2O_2, prostaglandin E_2	macrophages, NK cells
Neutralize complement	overexpress mCRPs	complement system

Table 15-3 The Biology of Cancer (© Garland Science 2007)

Table 15.4 Examples of anti-tumor immunotherapy strategies

Passive immunization
Infuse tumor-specific monoclonal antibodies (e.g., Herceptin, Rituxan)
Engraft histoincompatible marrow
Active immunization
Infuse activated tumor-infiltrating lymphocytes (TILs)
Infuse dendritic cells loaded with tumor-specific oligopeptide antigen
Add B7 co-activating receptor to introduced tumor-specific antigen
Block CTLA-4 function
Inhibit regulatory T cells

Table 15-4 The Biology of Cancer (© Garland Science 2007)

Table 15.4 Examples of anti-tumor immunotherapy strategies

Passive immunization
Infuse tumor-specific monoclonal antibodies (e.g., Herceptin, Rituxan)
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