

# Cytokines Reinvented

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# Cytokine approvals

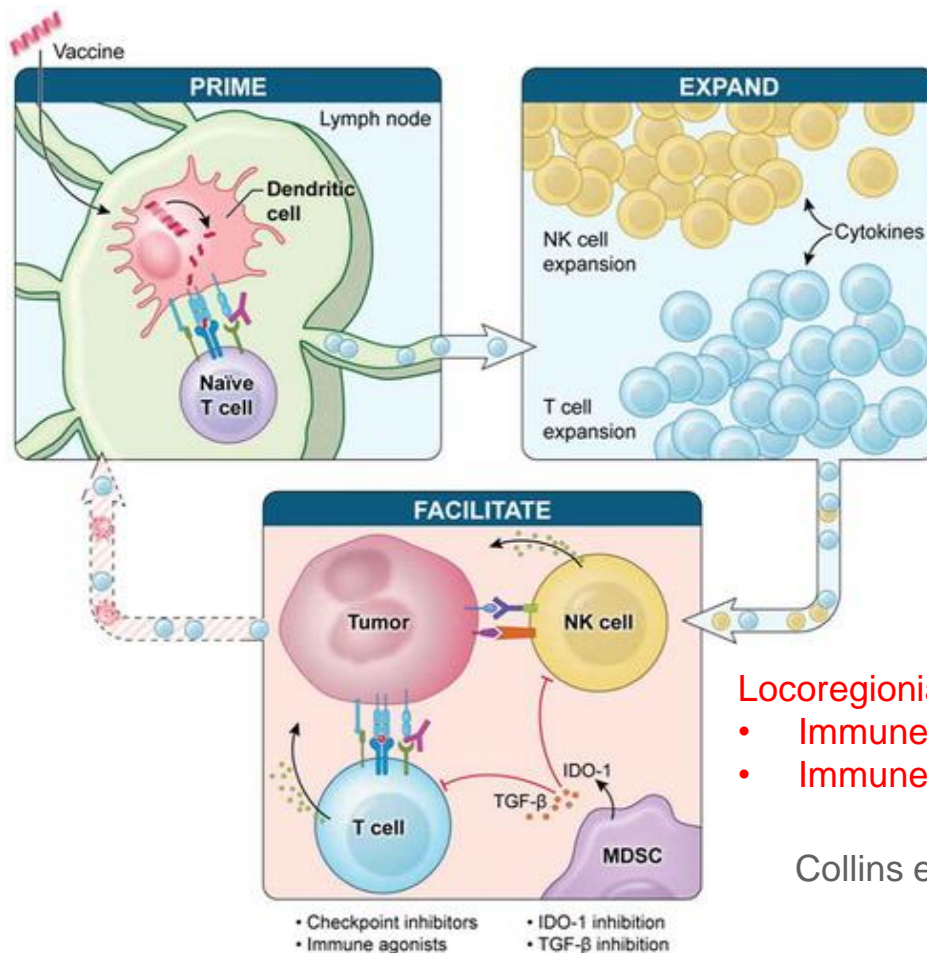
- IL-2 (1992)
- IFN- $\alpha$  (1986)

RCC, Melanoma, others

Toxicities and small proportion of patients benefiting limited clinical use

# Requirements for Effective Immunotherapy

Cytokines to prime existing responses and help prime de-novo responses



IL-2, IL-12, IL-15, IL-18

Locoregional cytokines

- Immune stimulatory
- Immune inhibitory: e.g., TGF- $\beta$

Collins et al., Expert Rev Vaccines 2018

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5:07 p.m.	NHS-IL-12, IL15 superagonist, M7824 <b>Marijo Bilusic, MD, PhD</b> – National Cancer Institute, National Institutes of Health
5:27 p.m.	Harnessing Potent Immune Agonist Pathways through Kinetic Engineering <b>Deborah Charych, PhD</b>
5:47 p.m.	Locoregional Cytokine Immunotherapy <b>K. Dane Wittrup, PhD</b> – Massachusetts Institute of Technology
6:07 p.m.	Immune monitoring after NKTR-214 plus nivolumab (PIVOT-02) in previously untreated patients with metastatic Stage IV melanoma <b>Adi Diab, MD</b> – The University of Texas MD Anderson Cancer Center
6:17 p.m.	Decoy-resistant Interleukin-18 overcomes the soluble immune checkpoint IL-18BP to unlock a potent immunotherapeutic cytokine pathway <b>Aaron Ring</b> – Yale School of Medicine