What is Immunotherapy?

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What is immunotherapy?

• What are the most important things to know about the immune system regarding cancer immunotherapy?
• How does the immune system recognize cancer?
• How can immunotherapy help the immune system fight cancer better?
Is this immunotherapy?
Step back for a minute: How do we target cancer systemically?

Chemotherapy

Metabolic Therapy

TKI

Molecularly Targeted

The key to oncology is separating normal self from tumor.
How Does The Immune System See Cancer?

Cells of the adaptive immune system

B-cell

T-cell
Question: Do we consider antibodies “immunotherapy”? 
T cells see inside the cell

Pollack et al., *J Clin Oncol* 2017
How do T cells distinguish a cancer cell from a normal cell?
How do T cells distinguish a cancer cell from a healthy cell in the normal can immune response?

1. Abnormally expressed immunogenic proteins
2. Mutated proteins
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So, how do immunotherapies work?
The two basic ways immunotherapy works:

1) Strengthening an existing immune response
2) Redirecting the immune system
Strengthening an immune response: Checkpoint inhibitors

- Toxicities?
- Which sarcomas?
- Biomarkers?
- CTLA4?

Derechou et al., Cancer Management and Research 2020
Redirecting the immune system: Gene Engineered Cells For Immunotherapy

1. Pheresis
2. Receptor gene transfer into T lymphocytes
   - lentivirus
   - gamma retrovirus
   - non-viral gene transfer
3. Expand receptor-engineered T lymphocytes ex vivo
4. Infusion
5. T-cell mediated tumor destruction

Johnson and June. Cell Research 2016
People are working on a variety of strategies for cancer immunotherapy

• Targeting inhibitory immune cells
• New checkpoints
• Vaccines
• NK cells
• Cytokines
• Integrating radiation and chemotherapy
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