Brand Name: Keytruda
Generic: pembrolizumab
Type: monoclonal antibody
Year Accepted/Phase: 2015

Mechanism:

Pembrolizumab is a monoclonal antibody that targets programmed cell death protein 1 (PD-1), a checkpoint receptor expressed on T cells.

Chemical Structure: N/A

Indication:

Keytruda (pembrolizumab) is approved for the treatment of various cancers, both as monotherapy and in combination with other anticancer therapies. Indications include:

Melanoma: Treatment of unresectable or metastatic melanoma.

Non-Small Cell Lung Cancer (NSCLC): First-line treatment of metastatic NSCLC with high PD-L1 expression (as determined by an FDA-approved test).

Head and Neck Squamous Cell Carcinoma (HNSCC): Treatment of recurrent or metastatic HNSCC.

Classical Hodgkin Lymphoma: Treatment of refractory or relapsed classical Hodgkin lymphoma.

Urothelial Carcinoma: Treatment of locally advanced or metastatic urothelial carcinoma.

Microsatellite Instability-High (MSI-H) or Mismatch Repair Deficient (dMMR) Cancer: Treatment of solid tumors that have progressed following prior treatment and have no satisfactory alternative treatment options.

Gastric Cancer: Treatment of advanced gastric or gastroesophageal junction adenocarcinoma with PD-L1 expression.

Clinical trials:

KEYNOTE-001 (Phase I)
Pubmed: https://pubmed.ncbi.nlm.nih.gov/25891174/
Purpose: Evaluate the safety, tolerability, and antitumor activity of pembrolizumab in patients with advanced solid tumors.
Dates: Conducted from 2011 to 2014.
Results: Demonstrated antitumor activity across multiple tumor types, particularly in melanoma and NSCLC. The study established a manageable safety profile for pembrolizumab.
Impact: This trial provided the foundational safety and efficacy data for subsequent pembrolizumab trials and FDA approvals.

KEYNOTE-006 (Phase III)
Pubmed: https://pubmed.ncbi.nlm.nih.gov/25891173/
Purpose: Compare pembrolizumab with ipilimumab in patients with advanced melanoma.
Dates: Conducted from 2013 to 2015.
Results: Pembrolizumab significantly improved progression-free survival (PFS) and overall survival (OS) compared to ipilimumab. The study led to the FDA approval of pembrolizumab for advanced melanoma in October 2015.
Impact: Established pembrolizumab as a preferred first-line treatment for advanced melanoma.

KEYNOTE-024 (Phase III)
Pubmed: https://pubmed.ncbi.nlm.nih.gov/27718847/
Purpose: Compare pembrolizumab with platinum-based chemotherapy in patients with previously untreated advanced NSCLC with PD-L1 expression on ≥50% of tumor cells.
Dates: Conducted from 2014 to 2016.
Results: Pembrolizumab significantly improved PFS and OS compared to chemotherapy. The median OS was 30.0 months for pembrolizumab versus 14.2 months for chemotherapy.
Impact: Led to the FDA approval of pembrolizumab as a first-line treatment for patients with advanced NSCLC with high PD-L1 expression in October 2016.

KEYNOTE-021 (Phase II)
Pubmed: https://pubmed.ncbi.nlm.nih.gov/27745820/
Purpose: Evaluate pembrolizumab in combination with chemotherapy (carboplatin and pemetrexed) versus chemotherapy alone in patients with previously untreated advanced non-squamous NSCLC.
Dates: Conducted from 2014 to 2016.

Results: The combination of pembrolizumab with chemotherapy significantly improved PFS and overall response rates (ORR) compared to chemotherapy alone.
Impact: Supported the FDA approval of pembrolizumab in combination with chemotherapy for the first-line treatment of advanced non-squamous NSCLC in May 2017.

KEYNOTE-189 (Phase III)
Pubmed: https://pubmed.ncbi.nlm.nih.gov/29658856/
Purpose: Confirm the efficacy and safety of pembrolizumab in combination with chemotherapy in patients with previously untreated metastatic non-squamous NSCLC.
Dates: Conducted from 2015 to 2018.
Results: Pembrolizumab combined with chemotherapy significantly improved OS, PFS, and ORR compared to chemotherapy alone. The median OS was 22.0 months for the combination versus 10.7 months for chemotherapy alone.
Impact: Reinforced the use of pembrolizumab with chemotherapy as a first-line treatment for metastatic non-squamous NSCLC and expanded its FDA approval in August 2018.