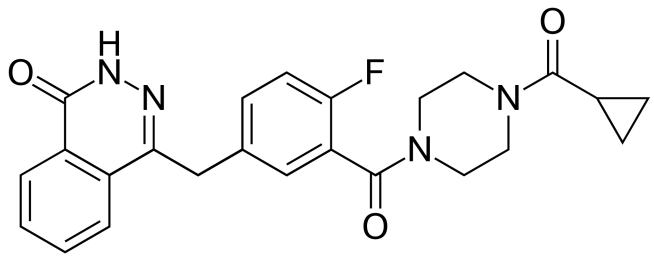
Brand Name: Lynparza
Generic: olaparib
Type: small molecule
Year Accepted/Phase: 2014

Mechanism:

Lynparza works by inhibiting PARP enzymes, which are involved in repairing damaged DNA in cells. By inhibiting PARP, Lynparza prevents cancer cells, particularly those with mutations in genes involved in DNA repair (such as BRCA1 and BRCA2), from repairing their DNA effectively. This leads to the accumulation of DNA damage in cancer cells, ultimately causing their death.

Chemical Structure:



Indication:

Ovarian Cancer: Lynparza is approved for the maintenance treatment of advanced ovarian cancer, including patients with BRCA mutations, either as a first-line maintenance therapy following response to platinum-based chemotherapy or as a maintenance therapy following recurrence.
Breast Cancer: It is also indicated for the treatment of metastatic breast cancer with BRCA mutations, especially in patients who have previously received chemotherapy.
Pancreatic Cancer: Lynparza is approved for treating metastatic pancreatic cancer with germline BRCA mutations, in combination with chemotherapy.

Clinical trials:

SOLO1 Trial (Phase III)
Pubmed: https://pubmed.ncbi.nlm.nih.gov/30345884/
Purpose: Evaluate the efficacy and safety of olaparib as a maintenance treatment in patients with newly diagnosed advanced ovarian cancer who have a BRCA1/2 mutation and are in complete or partial response following first-line platinum-based chemotherapy.
Dates: Conducted from September 2013 to May 2017.
Results: The trial showed a significant improvement in progression-free survival (PFS) for patients treated with olaparib compared to placebo. Median PFS was not reached in the olaparib group versus 13.8 months in the placebo group at the time of data cutoff.
Impact: This trial led to the FDA approval of Lynparza in December 2018 as a maintenance therapy for patients with BRCA-mutated advanced ovarian cancer following first-line chemotherapy.

SOLO2 Trial (Phase III)
Purpose: Assess the efficacy of olaparib tablets as maintenance therapy in patients with relapsed ovarian cancer who have BRCA1/2 mutations and are in complete or partial response following platinum-based chemotherapy.
Dates: Conducted from September 2013 to January 2017.
Results: The trial demonstrated that olaparib significantly extended PFS compared to placebo. Median PFS was 19.1 months for olaparib versus 5.5 months for placebo.
Impact: The results supported the use of olaparib as a maintenance therapy in the relapsed setting and contributed to further approvals and label expansions for Lynparza.

OlympiAD Trial (Phase III)
Pubmed: https://pubmed.ncbi.nlm.nih.gov/28578601/
Purpose: Compare the efficacy of olaparib to standard chemotherapy in patients with HER2-negative metastatic breast cancer with germline BRCA1/2 mutations.
Dates: Conducted from March 2014 to April 2017.
Results: Olaparib significantly improved PFS compared to chemotherapy. Median PFS was 7.0 months for olaparib versus 4.2 months for chemotherapy.
Impact: These findings led to the FDA approval of Lynparza in January 2018 for the treatment of germline BRCA-mutated, HER2-negative metastatic breast cancer.

POLO Trial (Phase III)
Pubmed: https://pubmed.ncbi.nlm.nih.gov/31157963/
Purpose: Evaluate the efficacy of olaparib as maintenance therapy in patients with germline BRCA-mutated metastatic pancreatic cancer whose disease had not progressed on first-line platinum-based chemotherapy.
Dates: Conducted from January 2014 to January 2019.
Results: The trial showed a significant improvement in PFS for patients treated with olaparib compared to placebo. Median PFS was 7.4 months for olaparib versus 3.8 months for placebo.
Impact: Based on these results, Lynparza was approved by the FDA in December 2019 for the maintenance treatment of germline BRCA-mutated metastatic pancreatic cancer.