

# TARGETED THERAPY

Targeted therapy treats cancer at its most basic biological level. Researchers study tumor cells to find molecular changes that may lead to cancer growth. They then develop “targeted” drugs to correct these changes. These changes or signs of changes are called biomarkers. Certain biomarkers have been associated with breast cancer. More may be discovered in the coming years.

There are different types of targeted therapy. You may get targeted therapy alone or in combination with other treatments, like chemotherapy or hormonal therapy.

The table (below and on the next page) lists targeted therapies by type and their possible side effects. Keep in mind that you may not get any or even most of the possible side effects of a drug. New treatments become available all the time so this may not be a complete list. **These are the latest targeted therapies that are available as of August 2020.**

TYPE OF TARGETED THERAPY	COMMON SIDE EFFECTS	IMPORTANT THINGS TO KNOW
<p><b>ANTI-HER 2 MONOCLONAL ANTIBODY</b></p> <ul style="list-style-type: none"> <li>• pertuzumab (Perjeta®)</li> <li>• trastuzumab (Herceptin®) and its biosimilars including:               <ul style="list-style-type: none"> <li>- trastuzumab-anns (Kanjinti™)</li> <li>- trastuzumab-dttb (Ontruzant®)</li> <li>- trastuzumab-dkst (Ogivri™)</li> <li>- trastuzumab-pkrb (Herzuma®)</li> <li>- trastuzumab-qyyp (Trazimera™)</li> </ul> </li> <li>• pertuzumab, trastuzumab, and hyaluronidase-zzxf (Phesgo™)</li> </ul>	<ul style="list-style-type: none"> <li>• Diarrhea (more common with Perjeta)</li> <li>• Fatigue</li> <li>• Rash</li> <li>• Hair thinning/loss</li> <li>• Flu-like symptoms such as fever, chills, and muscle aches (with Herceptin and its biosimilars, such as Ogivri)</li> <li>• Rare infusion reactions</li> <li>• Lung problems are a rare but serious side effect.</li> <li>• Heart damage is a rare but serious possible side effect especially in older people or those who have had prior anthracycline treatment.</li> </ul>	<ul style="list-style-type: none"> <li>• For HER2+ cancer.</li> <li>• Can work well to control MBC with few side effects.</li> <li>• Side effects often lessen after the first treatment.</li> <li>• Your doctor will test your heart function before, during, and after treatment.</li> <li>• Herceptin is available as an IV or an injection under the skin.</li> <li>• Phesgo is a combination of Perjeta and Herceptin available as an injection.</li> </ul>
<p><b>TYROSINE KINASE INHIBITOR</b></p> <ul style="list-style-type: none"> <li>• lapatinib (Tykerb®)</li> <li>• neratinib (Nerlynx®)</li> <li>• tucatinib (Tukysa™)</li> </ul>	<ul style="list-style-type: none"> <li>• Rash</li> <li>• Diarrhea</li> <li>• Fatigue</li> <li>• Nausea and vomiting (very mild for Tykerb)</li> <li>• Liver problems are a rare but serious side effect.</li> <li>• Heart damage is a rare but serious side effect of Tykerb.</li> </ul>	<ul style="list-style-type: none"> <li>• For HER2+ cancer.</li> <li>• Used with Xeloda and Herceptin when HER2+ cancer no longer responds to Herceptin alone.</li> <li>• Take Tykerb 1 hour before eating or 2 hours after eating.</li> <li>• Take Nerlynx with food to decrease nausea.</li> <li>• Avoid grapefruit juice and grapefruit while taking.</li> </ul>
<p><b>ANTIBODY-DRUG CONJUGATES</b></p> <ul style="list-style-type: none"> <li>• ado-trastuzumab emtansine (Kadcyla®)</li> <li>• fam-trastuzumab deruxtecan-nxki (Enhertu®)</li> <li>• sacituzumab govitecan-hziy (Trodelvy™)</li> </ul>	<ul style="list-style-type: none"> <li>• Low blood counts</li> <li>• Diarrhea (Trodelvy)</li> <li>• Risk for bleeding</li> <li>• Abnormal liver function tests</li> <li>• Mild nausea</li> <li>• Fatigue</li> <li>• Lung problems and heart damage are rare but serious side effects.</li> </ul>	<ul style="list-style-type: none"> <li>• Kadcyla and Enhertu are used for HER2+ cancer.</li> <li>• Trodelvy is used for triple negative breast cancer.</li> <li>• Kadcyla and Enhertu are a combination of Herceptin and a chemotherapy drug.</li> </ul>

# TARGETED THERAPY (Continued)

TYPE OF TARGETED THERAPY	COMMON SIDE EFFECTS	IMPORTANT THINGS TO KNOW
<b>MTOR INHIBITORS</b> <ul style="list-style-type: none"> <li>• everolimus (Afinitor®)</li> </ul>	<ul style="list-style-type: none"> <li>• Mouth sores</li> <li>• Rash</li> <li>• Irritation of the lining around the lungs</li> <li>• Diarrhea</li> <li>• Fatigue</li> <li>• Very mild nausea and vomiting</li> <li>• Weakness</li> <li>• Abnormal blood tests (such as cholesterol or glucose)</li> </ul>	<ul style="list-style-type: none"> <li>• For HR+/HER2- cancer</li> <li>• Light can affect this medicine.</li> <li>• Do not take with grapefruit, grapefruit juice, or St. John's wort.</li> <li>• Antifungal drugs, like fluconazole, may make this medicine stronger or worsen its side effects.</li> <li>• Tell all your doctors you are taking this drug.</li> <li>• Afinitor must be kept in the packaging it comes in.</li> </ul>
<b>PARP INHIBITORS</b> <ul style="list-style-type: none"> <li>• olaparib (Lynparza®)</li> <li>• talazoparib (Talzenna®)</li> </ul>	<ul style="list-style-type: none"> <li>• Low blood cell counts</li> <li>• Mild to moderate nausea &amp; vomiting</li> <li>• Fatigue</li> <li>• Diarrhea</li> <li>• Hair thinning/loss</li> <li>• Loss of Appetite</li> </ul> <p><b>Lynparza</b></p> <ul style="list-style-type: none"> <li>• Bone marrow problems are a rare but serious possible side effect.</li> </ul> <p><b>Talzenna</b></p> <ul style="list-style-type: none"> <li>• Liver problems are a rare but serious possible side effect.</li> </ul>	<ul style="list-style-type: none"> <li>• For HER2-/BRCA+ cancer</li> <li>• May interact with other drugs. Tell your doctor about everything else you are taking.</li> <li>• Avoid grapefruit and grapefruit juice while taking.</li> </ul>
<b>CDK 4, 6 INHIBITORS</b> <ul style="list-style-type: none"> <li>• abemaciclib (Verzenio®)</li> <li>• palbociclib (Ibrance®)</li> <li>• ribociclib (Kisqali®)</li> </ul>	<ul style="list-style-type: none"> <li>• Low blood cell counts</li> <li>• Diarrhea (ask your doctor about taking an anti-diarrheal medicine before treatment), most common with Verzenio</li> <li>• Mild nausea &amp; vomiting</li> <li>• Fatigue</li> <li>• Hair thinning/loss (common for Kisqali &amp; Ibrance)</li> </ul>	<ul style="list-style-type: none"> <li>• For HR+/HER2- cancer. Being studied for HR+/HER2+ cancer.</li> <li>• Ibrance and Kisqali are given in four-week cycles with 3 weeks of drug then 1 week off. Verzenio is continuous.</li> <li>• Avoid grapefruit and grapefruit juice while taking.</li> </ul>
<b>PI3K INHIBITOR</b> <ul style="list-style-type: none"> <li>• alpelisib (Piqray®)</li> </ul>	<ul style="list-style-type: none"> <li>• Diarrhea</li> <li>• High blood sugar</li> <li>• Change in kidney or liver function</li> <li>• Skin rash/itching</li> <li>• Fatigue</li> <li>• Nausea &amp; vomiting</li> <li>• Low blood counts</li> <li>• Mouth sores</li> <li>• Loss of appetite</li> </ul>	<ul style="list-style-type: none"> <li>• For HR+/HER2-/PI3K+ breast cancer in men and post-menopausal women</li> <li>• Given with Faslodex</li> <li>• May interact with other drugs. Tell your doctor about everything else you are taking.</li> <li>• Do not take with grapefruit, grapefruit juice, or St. John's wort.</li> </ul>