

# [Personalised cancer treatment: known markers in treatment](https://assignbuster.com/personalised-cancer-treatment-known-markers-in-treatment/)

\n[toc title="Table of Contents"]\n

\n \t

1. [Known markers and what they mean for treatment](#known-markers-and-what-they-mean-for-treatment) \n \t
2. [Overview](#overview) \n \t
3. [Drug target markers](#drug-target-markers) \n \t
4. [Diagnostic and prognostic markers](#diagnostic-and-prognostic-markers) \n \t
5. [Meta description](#meta-description) \n \t
6. [Keywords](#keywords) \n \t
7. [Copyscape](#copyscape) \n

\n[/toc]\n \n

Personalised cancer treatment – known markers and what they mean for treatment

Contents (Jump to)

Known markers and what they mean for treatment

Overview

Drug target markers

Diagnostic and prognostic markers

Meta description

Keywords

Copyscape

## Known markers and what they mean for treatment

## Overview

Personalised, targeted and hormonal treatments all depend on genetic mutations that can be identified in cancer cells to be effective. These mutations are sometimes referred to as “ markers”. The markers can manifest through over-expression, lack of expression or mutated expression of specific proteins.

Some markers can be targeted using specific treatments whereas some can act as measurements for disease diagnosis, prognosis and treatment response.

## Drug target markers

The genes listed below have all been associated in cancer, the majority of which can also be treated.

|  |  |  |
| --- | --- | --- |
| Known marker  | Cancers they’re associated with / may benefit from targeted therapy  | Related treatment/response to treatment  |
| ALK[EB1]– anaplastic lymphoma kinase (\*)  | * Anaplastic large-cell lymphoma
* Familial neuroblastoma (nerve cell)
* Non-small cell lung cancer (NSCLC)
 | * Crizotinib (Xalkori®)
* Pemetrexed (Alimta®)
 |
| AR– androgen receptor  | * Bladder
* Breast
* NSCLC
* Ovarian
* Prostate
 | * Abarelix (Plenaxis®)
* Bicalutamide (Casodex®)
* Flutamide (Eulexin®)
* Gonadorelin (Factrel®)
* Goserelin (Zoladex®)
* Leuprolide (Lupron®)
 |
| BRAF– v-raf murine sarcoma viral oncogene homolog B1  | * Colon
* Lung
* Melanoma (skin)
* Nervous system
* Thyroid
 | * Cetuximab (Erbitux®)
* Panitumumab (Vectibix®)
* Vemurafenib (Zelboraf®)
 |
| BRCA1– breast cancer susceptibility gene 1  | * Breast
* Lung
* Ovarian
 | * Cisplatin (Platinol®)
* Prophylactic surgery (prevention)
 |
| BRCA2– breast cancer susceptibility gene 2  | * Breast
* Ovarian
 | * Tamoxifen (Nolvadex®)
* Prophylactic surgery (prevention)
 |
| c-Kit/CD117/SCFR – mast stem cell factor receptor (\*)  | * Acute myelogenous leukemia (AML)
* Gastrointestinal stromal tumour (GIST)
* Melanoma
 | * Imatinib (Gleevec®)
* Sorafenib (Nexavar®)
* Sunitinib (Sutent®)
 |
| c-MET/HGFR – mesenchymal epithelial transition factor/hepatocyte growth factor receptor  | * NSCLC
* Ovarian
 | * Erlotinib (Tarceva®)
* Gefitinib (Iressa®)
 |
| COX-2/PTGS2 – cyclooxygenase-2/ prostaglandin-endoperoxide synthase-2  | * NSCLC
 | * Celecoxib (Celebrex®)
 |
| EGFR/ErbB-1/HER1 – epidermal growth factor receptor (\*)  | * NSCLC
 | * Cetuximab (Erbitux®)
* Erlotinib (Tarceva®)
* Gefitinib (Iressa®)
* Panitumumab (Vectibix®)
 |
| ER– oestrogen receptor (\*)  | * Breast
* Female reproductive tract (cervical, fallopian, ovarian, uterine)
 | * Anastrazole (Arimidex®)
* Exemestane (Aromasin®)
* Fulvestrant (Faslodex®)
* Goserelin (Zoladex®)
* Letrozole (Femara®)
* Leuprolide (Eligard®, Lupron®, Viadur®)
* Medroxyprogesterone, (Provera®, Amen®, Curretab®, Cycrin®)
* Megestrol acetate (Megace®, Megace® ES)
* Tamoxifen (Nolvadex®)
* Toremifene (Fareston®)
 |
| ERCC1– excision repair cross-complementation group 1  | * Bladder
* Colorectal
* Gastric
* Lung (NSCLC and SCLC)
* Ovarian
 | * Carboplatin (Paraplatin®)
* Oxaliplatin (Eloxatin®)
 |
| HER2/HER2neu/ErbB-2 – human epidermal growth factor receptor 2 (\*)  | * Breast
* Colorectal
* Gastric
* Gastroesophageal
* Ovarian
 | * Doxorubicin (Adriamycin®, Rubex®)
* Epirubicin (Ellence®)
* Lapatinib (Tykerb®)
* Liposomal doxorubicin (Caelyx®, Myocet®),
* Trastuzumab (Herceptin®)
 |
| KRAS– Kirsten murine sarcoma virus (\*)  | * Colon
* NSCLC
* Pancreatic
 | * Cetuximab (Erbitux®)
* Erlotinib (Tarceva®)
* Gefitinib (Iressa®)
* Panitumumab (Vectibix®)
 |
| MGMT– O-6-methylguanine-DNA methyltransferase  | * Breast
* Glioblastoma multiforme (brain)
* Melanoma
* NSCLC
* Oesophageal
* Oligodendrogliomas
* Pituitary gland carcinoma
 | * Resistant to temozolomide (Temodar®)
 |
| MRP1– multidrug resistance-associated protein 1  | * Breast
* Head and neck
* Lymphoma
 | * Resistant to doxorubicin (Adrimycin®), vinca alkaloids, methotrexate (Trexall®)
 |
| PGP– p-glycoprotein  | * Breast
* Head and neck
* Lymphoma
* Ovarian
 | * Resistant to doxorubicin (Adriamycin®), epirubicin (Ellence®), liposomal-doxorubicin (Doxil®), paclitaxel (Taxol®), docetaxel (Taxotere®), vinblastine (Velban®), vincristine (Oncovin®), vinorelbine (Navelbine®)
 |
| PIK3CAα– phosphatidylinositol-4, 5-bisphosphate 3-kinase, catalytic subunit alpha  | * Breast
* Colorectal
* Gastric
* Glioblastoma
* Lung
* Ovarian
 | * Lapatinib (Tykerb®)
* Resistant to cetuximab (Erbitux®), panitumumab (Vectibix)
* Decreased response to trastuzumab (Herceptin®)
 |
| PR– progesterone receptor (\*)  | * Breast
* Female genital tract cancer
* Ovarian
 | * Anastrozole (Arimidex®)
* Exemestane (Aromasin®)
* Foremifene (Fareston®)
* Fulvestrant (Faslodex®)
* Gonadorelin (Factrel®)
* Goserelin (Zoladex®)
* Letrozole (Femara®)
* Leuprolide (Eligard®, Lupron®, Viadur®)
* Medroxyprogesterone (Provera®, Amen®, Curretab®, Cycrin®)
* Megestrol acetate (Megace®, Megace® ES)
* Tamoxifen (Nolvadex®)
 |
| PTEN– phosphatase and tensin homolog  | * Breast
* Colon
* Glioblastoma
* Head and neck
* NSCLC
 | * Resistant to cetuximab (Erbitux®), erlotinib (Tarceva®), gefitinib (Iressa®), panitumumab (Vectibix®), trastuzumab (Herceptin®)
 |
| RRM1– ribonucleotide reductase subunit M1  | * NSCLC
* Pancreatic
 | * Decreased response to gemcitabine (Gemzar®), hydroxyurea (Hydrea®, Droxia®)
 |
| SPARC– secreted protein acidic rich in cysteine  | * Breast
* Gastric
* Head and neck
* Melanoma
* Pancreatic
 | * Albumin-bound paclitaxel/nab-paclitaxel (Abraxane®)
 |
| TLE3– transducin-like enhancer of split  | * Breast
* Ovarian
 | * Docetaxel (Taxotere ®)
* Paclitaxel (Taxol®),
 |
| TOPO2α– topoisomerase IIα  | * Breast
* Colon
* SCLC
* Ovarian
 | * Doxorubicin (Adriamycin®)
* Epirubicin (Ellence®, Pharmorubucin®)
* Liposomal doxorubicin (Caelyx®, Myocet®)
 |
| TS– thymidylate synthetase  | * Breast
* Colon
* Gastric
* Head and neck
* Liver
* NSCLC
* Pancreatic
 | * Resistant to 5-fluorouracil (Adrucil®), cytarabine (Cytosar-U®), pemetrexed (Alimta®)
 |
| TUBB3– Class III -tubulin  | * NSCLC
* Ovarian
 | * Docetaxel (Taxotere ®)
* Paclitaxel (Taxol®)
* Vinorelbine (Navelbine®)
 |

(\*) – Targetable genes and proteins that can also be measured to determine treatment response, cancer diagnosis and prognosis.

## Diagnostic and prognostic markers

The following markers are all related to diagnosis, prognosis and treatment progress.

|  |  |  |
| --- | --- | --- |
| Known marker  | Associated cancer  | Role  |
| α (alpha)-fetoprotein  | * Germ cell
* Liver
 | Germ cell tumour staging, prognosis, response to treatment Liver cancer diagnosis, response to treatment  |
| β (beta)-2-microglobulin  | * Chronic lymphocytic leukaemia (CLL)
* Lymphoma
* Multiple myeloma
 | Prognosis, response to treatment  |
| β (beta)-human chorionic gonadotropin (β-hCG)  | * Choriocarcinoma (uterine)
* Testicular
 | Staging, prognosis, response to treatment  |
| BCR-ABL fusion gene  | * Chronic myeloid leukaemia (CML)
 | Diagnosis, disease status monitoring  |
| BRAF (mutation V600E)  | * Colorectal
* Melanoma
 | Response to targeted treatment  |
| CA15-3/CA27. 29  | * Breast
 | Treatment success, disease recurrence  |
| CA19-9  | * Bile duct
* Gallbladder
* Gastric
* Pancreatic
 | Treatment success  |
| CA-125  | * Ovarian
 | Diagnosis, treatment response, disease recurrence  |
| Calcitonin  | * Medullary thyroid
 | Diagnosis, treatment success, disease recurrence  |
| Carcinoembryonic antigen (CEA)  | * Breast
* Colorectal
 | Breast cancer recurrence, treatment response Colorectal disease advance  |
| CD20  | * Non-Hodgkin lymphoma (NHL)
 | Response to targeted treatment  |
| Chromogranin A (CgA)  | * Neuroendocrine tumours
 | Diagnosis, treatment response, disease recurrence  |
| Chromosomes 3, 7, 17, 9p21  | * Bladder
 | Disease recurrence  |
| Cytokeratin fragments 21-1  | * Lung
 | Disease recurrence  |
| Fibrin/fibrinogen  | * Bladder
 | Treatment response  |
| Human epididymis protein 4 (HE4)  | * Ovarian
 | Disease progression, disease recurrence  |
| Immunoglobulins (antibodies)  | * Multiple myeloma (MM)
* Waldenström macroglobulinemia (blood)
 | Diagnosis, treatment response, disease recurrence  |
| Lactate dehydrogenase  | * Germ cell tumours
 | Staging, prognosis, treatment response  |
| Nuclear matrix protein 22  | * Bladder
 | Treatment response  |
| Plasminogen activator inhibitor (PAI-1)  | * Breast
 | Grading, treatment planning  |
| Prostate-specific antigen (PSA)  | * Prostate
 | Diagnosis, treatment response, disease recurrence  |
| Thyroglobulin  | * Thyroid
 | Treatment response, disease recurrence  |
| Urokinase plasminogen activator (uPA)  | * Breast
 | Grading, treatment planning  |

## Meta description

Cancer markers can help with the diagnosis and treatment of cancer and can give access to targeted therapies.

## Keywords

Cancer markers, genetic markers, diagnostic markers, drug target markers

## Copyscape

Checked Sep 2014

CIGNPOST: KNOWN MARKERS AND WHAT THEY MEAN FOR TREATMENT© Cignpost Ltd 2014PAGE | 1

[EB1]If these are genes not proteins then they should be in italics