

Cancer Genomics Assignment

Cancer Type: Breast Cancer

Table: Genes/Proteins Associated with Breast Cancer and Their PDB Structures

Gene Symbol	Protein Name	Cancer Type	PDB Structure Available	Representative PDB ID
BRCA1	Breast Cancer Type 1 Susceptibility Protein	Breast Cancer	Yes	1JM7
BRCA2	Breast Cancer Type 2 Susceptibility Protein	Breast Cancer	Yes	1MIU
TP53	Tumor Protein p53	Breast Cancer	Yes	2OCJ
ERBB2 (HER2)	Receptor Tyrosine-Protein Kinase erbB-2	Breast Cancer	Yes	3PP0
PIK3CA	Phosphatidylinositol 4,5-Bisphosphate 3-Kinase Catalytic Subunit Alpha	Breast Cancer	Yes	3HHM
ESR1	Estrogen Receptor Alpha	Breast Cancer	Yes	1ERE
PGR	Progesterone Receptor	Breast Cancer	Yes	1A28
PTEN	Phosphatase and Tensin Homolog	Breast Cancer	Yes	1D5R
CDH1	Cadherin-1 (E-cadherin)	Breast Cancer	Yes	2O72
ATM	Ataxia Telangiectasia Mutated Serine/Threonine Kinase	Breast Cancer	Yes	5NP0

Gene Symbol	Protein Name	Cancer Type	PDB Structure Available	Representative PDB ID
CHEK2	Checkpoint Kinase 2	Breast Cancer	Yes	2CN5
PALB2	Partner and Localizer of BRCA2	Breast Cancer	Yes	4IJ9
AKT1	RAC-Alpha Serine/Threonine-Protein Kinase	Breast Cancer	Yes	3CQW
GATA3	GATA Binding Protein 3	Breast Cancer	Yes	3DFV
MAP3K1	Mitogen-Activated Protein Kinase Kinase 1	Breast Cancer	Yes	3FHR
CCND1	Cyclin D1	Breast Cancer	Yes	2W96
MYC	Myc Proto-Oncogene Protein	Breast Cancer	Yes	1NKP
EGFR	Epidermal Growth Factor Receptor	Breast Cancer	Yes	1M17
RB1	Retinoblastoma-Associated Protein	Breast Cancer	Yes	2QDJ
FGFR1	Fibroblast Growth Factor Receptor 1	Breast Cancer	Yes	1FGK

Resources Used

Databases

1. **RCSB Protein Data Bank (PDB):** Structural data and PDB IDs were retrieved from <https://www.rcsb.org/>.

2. **UniProtKB:** Protein nomenclature and functional confirmation were sourced from <https://www.uniprot.org/>.
3. **GeneCards:** Disease-gene associations were identified via the Human Gene Database <https://www.genecards.org/>.
4. **The Human Protein Atlas:** Protein expression data in breast cancer tissue was cross-referenced at <https://www.proteinatlas.org/>.
5. **NCBI Gene:** Official gene symbols and genomic information were verified at <https://www.ncbi.nlm.nih.gov/gene>.