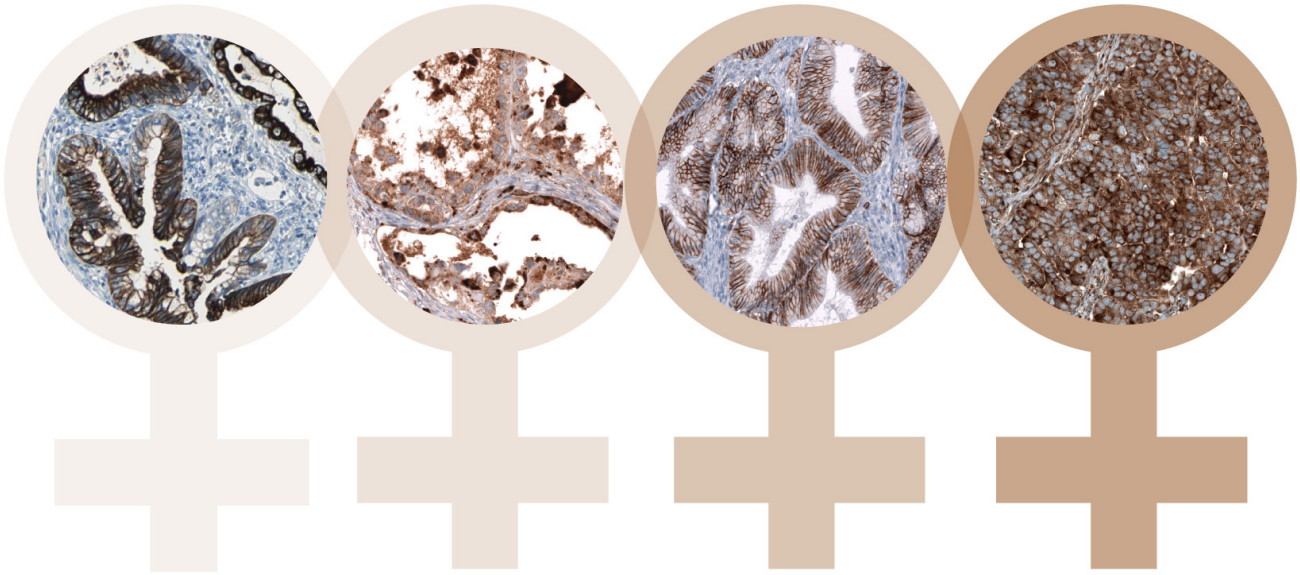
PRIMARY ANTIBODIES FOR CANCER RESEARCH



PROGNOSTIC MARKERS IN

GYNECOLOGICAL CANCERS

endometrial - cervical - ovarian

ATLAS ANTIBODIES

Prognostic Markers in Gynecological Cancers

Gynecological cancers affect the reproductive organs of women.

The main types of gynecologic cancer are: endometrial, cervical, ovarian, uterine, vaginal/vulvar. A sixth type of gynecologic cancer is the sporadic fallopian tube cancer.

Of all the gynecological cancers, only cervical cancer has screening tests to find this cancer early, when treatment can be most effective.

Therefore, there is a high demand to identify biomarkers specific to these diseases for screening for early detection and new therapeutic targets.

The Human Protein Atlas (HPA) has classified the genes associated with unfavorable and favorable prognoses in cervical, endometrial, and ovarian cancers.

For *unfavorable genes*, higher relative expression levels at diagnosis significantly lower overall survival for the patients.

For *favorable genes*, higher relative expression levels at diagnosis give significantly higher overall survival for the patients.

Atlas Antibodies continues searching for better early detection markers and new therapeutic targets.

This white paper presents our selected TripleA Polyclonals™ and PrecisA Monoclonals™ targeting the top 20 unfavorable and favorable prognostic markers in female gynecological cancers:

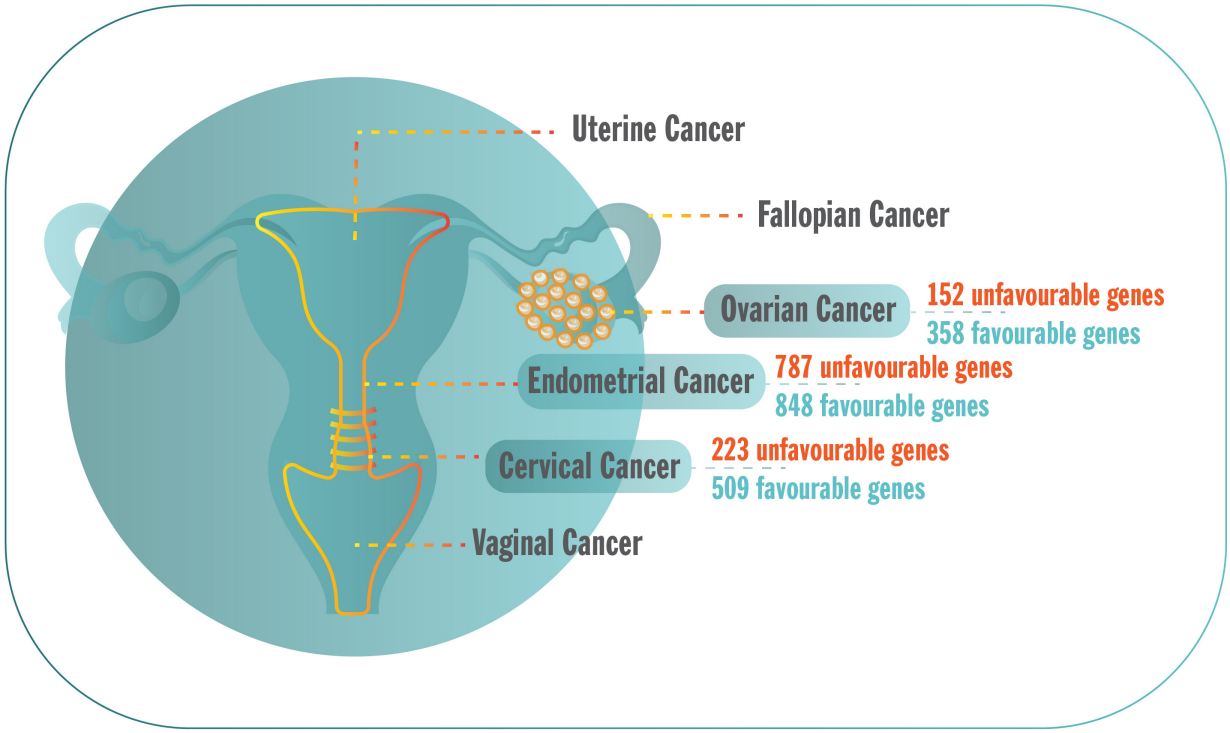


Figure 1. Schematic of cancers of the female genital tract and number of unfavorable and favorable genes detected in ovarian, endometrial and cervical cancer according to the Human Protein Atlas project (proteinatlas.org).

Endometrial Cancer: Unfavorable and Favorable Prognostic Genes

Endometrial cancer originates from the endometrium (the mucosal lining of the uterus). It is the 5th most common cancer in women and one of the most common forms of gynecological cancer in developed countries. Endometrial cancer is highly associated with hormonal factors.

Endometrial cancer is rising, which is believed to be related to increased life expectancy and the epidemic of obesity.

Around 80% of endometrial cancers represent endometrioid histology. These are considered hormone-dependent, and the prognosis of endometrioid cancers is generally favorable.

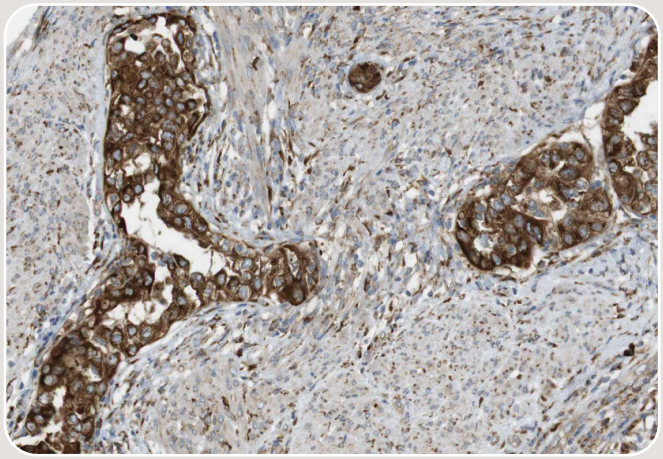
The majority of endometrial cancers are detected at an early stage, with the disease restricted to the uterus.

The 5-year survival rate in patients without metastatic disease varies from 74% to 91%.

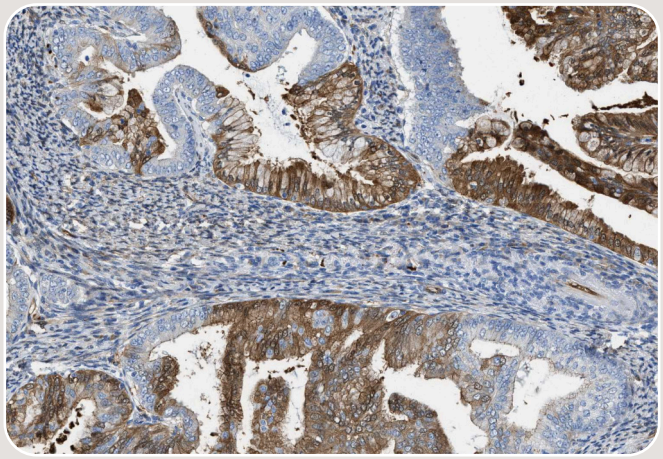
According to The Human Protein Atlas (HPA), the prognostic genes in endometrial cancers are:

- **787** unfavorable genes
- **848** favorable genes

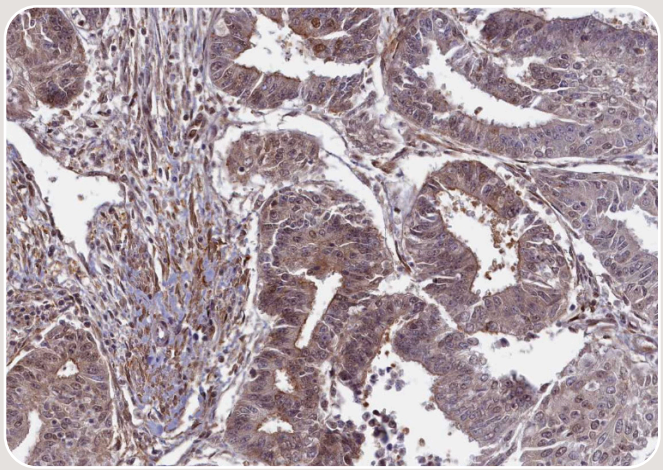
Table 1 lists the top 20 unfavorable and favorable prognostic genes in endometrial cancer and the corresponding Atlas Antibodies protein markers for IHC, WB, and ICC-IF.



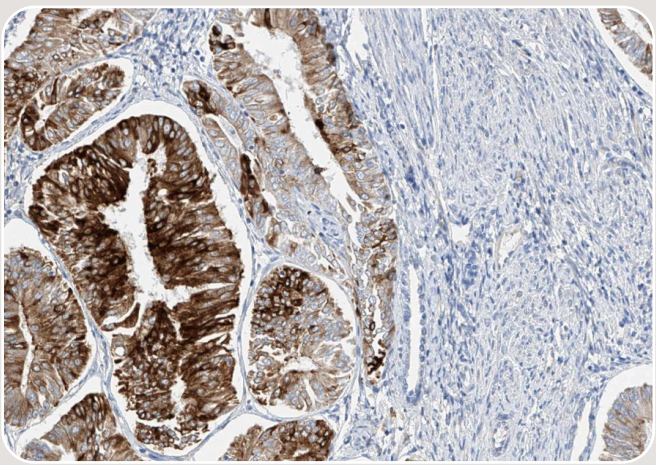
Anti-MBOAT2 (HPA014836) Unfavorable
Endometrial cancer



Anti-ASS1 (HPA020896) Unfavorable
Endometrial cancer



Anti-HIF3A (HPA041141) Unfavorable
Endometrial cancer



Anti-SCGB2A1 (HPA034584) Favorable
Endometrial cancer

Table 1: Prognostic Genes in Endometrial Cancer and Corresponding Protein Markers

Top 20 UNFAVORABLE PROGNOSTIC genes in endometrial cancer	Prognostic p-value	Product Name	Product Number
L1 cell adhesion molecule	8.51e-10	Anti-L1CAM	AMAb91829*, HPA005830*
membrane bound O-acyltransferase domain containing 2	2.13e-9	Anti-MBOAT2	HPA014836*
hypoxia inducible factor 3 subunit alpha	6.90e-9	Anti-HIF3A	HPA041141
argininosuccinate synthase	8.14e-9	Anti-ASS1	HPA020896*, HPA020934*
pentraxin 3	8.35e-9	Anti-PTX3	HPA069320
family with sequence similarity 110 member B	3.88e-8	Anti-FAM110B	HPA008318, HPA011781
immunoglobulin superfamily member 1	4.25e-8	Anti-IGSF1	HPA012732*
alpha-1,3-mannosyl-glycoprotein 4-beta-N-acetylglucos-aminyltransferase A	6.48e-8	Anti-MGAT4A	HPA007608
ketohexokinase	7.62e-8	Anti-KHK	HPA007040*
microtubule affinity regulating kinase 4	8.31e-8	Anti-MARK4	HPA039186
G protein regulated inducer of neurite outgrowth 2	8.60e-8	Anti-GPRIN2	HPA070760
erb-b2 receptor tyrosine kinase 2	8.99e-8	Anti-ERBB2	HPA001338, HPA001383
diacylglycerol lipase alpha	1.13e-7	Anti-DAGLA	HPA062497
adenosine deaminase	1.23e-7	Anti-ADA	HPA001399*, HPA023884*
cyclin dependent kinase inhibitor 2A	1.82e-7	Anti-CDKN2A	HPA047838
ring finger protein 44	2.57e-7	Anti-RNF44	HPA038981
leucine rich repeat neuronal 2	2.59e-7	Anti-LRRN2	HPA029124*
tripartite motif containing 46	2.61e-7	Anti-TRIM46	HPA030389, HPA055583*
microtubule associated protein 1 light chain 3 gamma	2.90e-7	Anti-ARL4C	HPA028927*
NUAK family, SNF1-like kinase, 2	3.01e-7	Anti-NUAK2	HPA008958

Top 20 FAVORABLE PROGNOSTIC genes in endometrial cancer	Prognostic p-value	Product Name	Product Number
beta-1,4-N-acetyl-galactosaminyltransferase 3	1.69e-10	Anti-B4GALNT3	HPA011404*
purinergic receptor P2X 4	6.30e-10	Anti-P2RX4	HPA039494*
SAM pointed domain containing ETS transcription factor	9.26e-9	Anti-SPDEF	HPA055707
secretoglobin family 2A member 1	1.54e-8	Anti-SCGB2A1	HPA034584*
dehydrogenase/reductase 7B	1.98e-8	Anti-DHRS7B	HPA012132*, HPA016873
phospholipid phosphatase 2	3.21e-8	Anti-PLPP2	HPA055540
nucleoredoxin like 2	3.83e-8	Anti-NXNL2	HPA045526
solute carrier family 47 member 1	5.54e-8	Anti-SLC47A1	HPA021987*
hexosaminidase subunit alpha	5.63e-8	Anti-HEXA	HPA018082
progesterone receptor	5.76e-8	Anti-PGR	AMAb91529*, HPA004751*
syntaxin 18	6.33e-8	Anti-STX18	HPA003019
sperm associated antigen 4	9.52e-8	Anti-SPAG4	HPA048393, HPA061789
secretoglobin family 2A member 2	9.57e-8	Anti-SCGB2A2	AMAb91536
zeta chain of T cell receptor associated protein kinase 70	9.66e-8	Anti-ZAP70	HPA003134*
G protein-coupled receptor 108	1.04e-7	Anti-GPR108	HPA041924, HPA041951
msh homeobox 1	1.64e-7	Anti-MSX1	HPA063895, HPA073604*
serine incorporator 2	1.69e-7	Anti-SERINC2	HPA005974*
high mobility group 20B	1.72e-7	Anti-HMG20B	HPA050220, HPA069832
coiled-coil domain containing 159	1.87e-7	Anti-CCDC159	HPA047126, HPA054655
cysteine rich with EGF like domains 2	2.42e-7	Anti-CRELD2	HPA000603

** Enhanced Validation*

Cervical Cancer: Unfavorable and Favorable Prognostic Genes

Cervical cancer is the 3rd most common type of cancer in women worldwide. Globally, the average age at diagnosis ranges from 44 years to 68 years.

There are two main types of cervical cancer:
- squamous cell carcinomas: originating from the squamous epithelium of the distal portion of the cervix.
- adenocarcinomas: arising from the columnar cells in the endocervical channel.

The leading cause of cervical cancer is infection with Human Papilloma Viruses (HPV), which accounts for 99% of cervical cancer. While HPV infection is considered to cause most of the squamous cell carcinomas, adenocarcinomas are only partially associated with such infection. Also, there is an approved vaccine for the prevention of HPV infection.

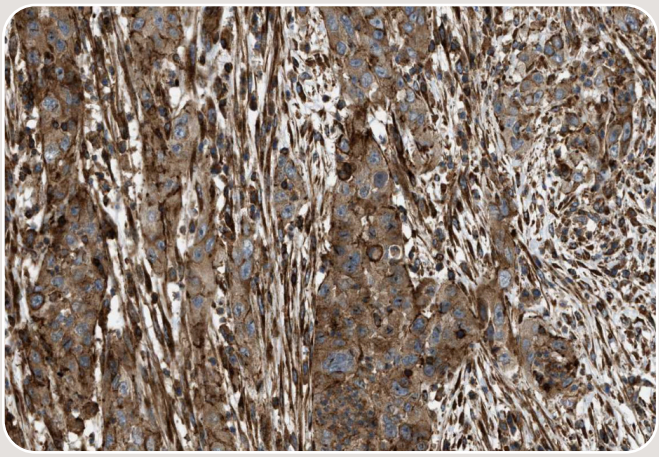
Risk factors include having sex at an early age, having multiple sexual partners, smoking, and poor socio-economic status.

The the 5-years survival rate varies greatly depending on the cancer stage. With treatment, is:
- 80-90% of women at stage I
- 50-65% of women at stage II
- 25-35% of women at stage III
- 15% or fewer women at stage IV.

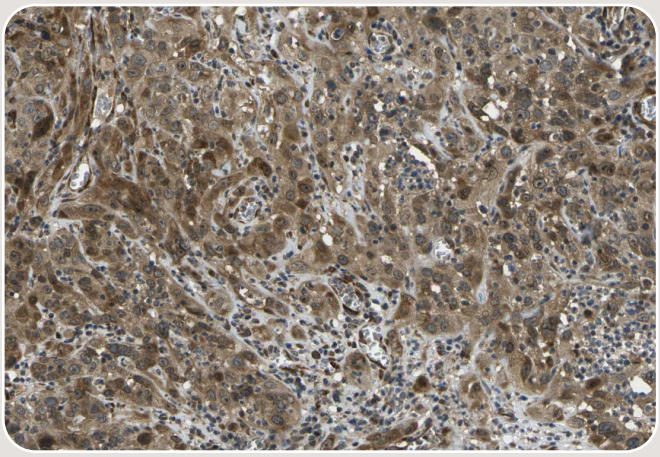
The Human Protein Atlas (HPA) has classified the genes associated with unfavorable and favorable prognoses in cervical cancer. According to the Pathology section of the HPA in cervical cancer, there are:

- **223** unfavorable genes
- **509** favorable genes

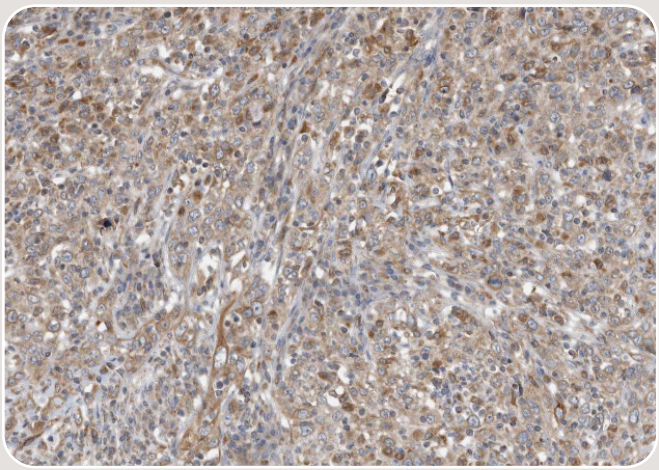
Table 2 lists the top 20 unfavorable and favorable prognostic genes detected in cervical cancer and the corresponding Atlas Antibodies protein markers for IHC, WB, and ICC-IF.



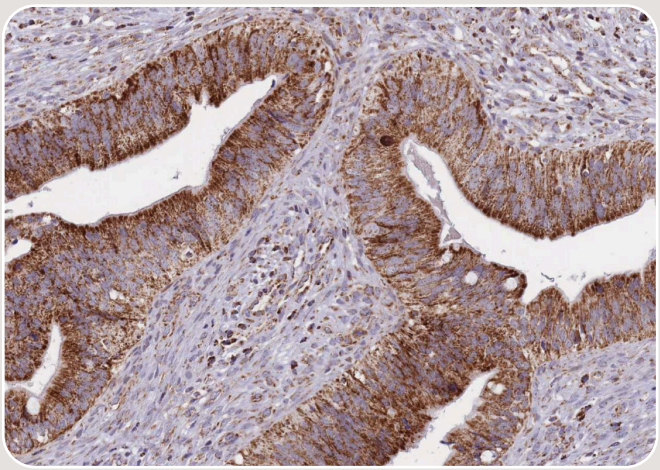
Anti-EGLN1 (HPA022129) Unfavorable
Cervical cancer, Squamos Cell Carcinoma



Anti-FUT11 (HPA014033) Unfavorable
Cervical cancer, Squamos Cell Carcinoma



Anti-PON2 (HPA029193) Unfavorable
Cervical cancer, Squamos Cell Carcinoma



Anti-DDX49 (HPA048093) Favorable
Cervical cancer, Adenocarcinoma

Table 2: Prognostic Genes in Cervical Cancer and Corresponding Protein Markers

Top 20 UNFAVORABLE PROGNOSTIC genes in cervical cancer	Prognostic p-value	Product Name	Product Number
egl-9 family hypoxia inducible factor 1	2.99e-7	Anti-EGLN1	HPA022129
polypeptide N-acetylgalactosaminyltransferase 2	1.22e-6	Anti-GALNT2	HPA011222*
fucosyltransferase 11	2.39e-6	Anti-FUT11	HPA014033
androgen induced 1	3.26e-6	Anti-AIG1	HPA060766
argininosuccinate lyase	4.05e-6	Anti-ASL	HPA016646*
integrin subunit alpha 5	4.07e-6	Anti-ITGA5	AMAb91447*, AMAb91449*
ETS transcription factor ERG	6.18e-6	Anti-ERG	HPA046598
sulfatase modifying factor 2	6.58e-6	Anti-SUMF2	HPA024040*
SPRY domain containing 7	8.48e-6	Anti-SPRYD7	HPA043934
chromosome 1 open reading frame 74	8.52e-6	Anti-C1orf74	HPA028496
TATA-box binding protein associated factor, RNA polymerase I subunit A	9.26e-6	Anti-TAF1A	HPA054334
lysyl oxidase like 2	9.83e-6	Anti-LOXL2	HPA036257, HPA056542
transforming growth factor beta induced	1.03e-5	Anti-TGFBI	HPA008612*, HPA017019*
molybdenum cofactor synthesis 1	1.07e-5	Anti-MOCS1	HPA045783, HPA058177
C-X-C motif chemokine ligand 8	1.18e-5	Anti-CXCL8	HPA057179
prolyl 4-hydroxylase subunit alpha 2Intracellular	1.24e-5	Anti-P4HA2	AMAb90710*, HPA01699*
fatty acid synthase	1.42e-5	Anti-FASN	HPA006461*, HPA056108*
paraoxonase 2	1.43e-5	Anti-PON2	HPA029193*
SET and MYND domain containing 2	1.53e-5	Anti-SMYD2	HPA029023
methylenetetrahydrofolate dehydrogenase 1 like	1.68e-5	Anti-MTHFD1L	HPA029040*

Top 20 FAVORABLE PROGNOSTIC genes in cervical cancer	Prognostic p-value	Product Name	Product Number
ELL associated factor 2	2.25e-9	Anti-EAF2	HPA008411*
non-SMC condensin II complex subunit H2	2.24e-8	Anti-NCAPH2	HPA067932*, HPA069056*
kinesin family member 22	3.87e-8	Anti-KIF22	HPA041076*, HPA048213
RIB43A domain with coiled-coils 2	7.08e-8	Anti-RIBC2	HPA003210
phospholipase A1 member A	2.81e-7	Anti-PLA1A	HPA059740
serine protease 36	2.97e-7	Anti-PRSS36	HPA036079
NMRA like redox sensor 1	3.33e-7	Anti-NMRAL1	HPA041353*
TNF receptor superfamily member 13C	4.44e-7	Anti-TNFRSF13C	HPA003246*
iron-sulfur cluster assembly enzyme	4.90e-7	Anti-ISCU	HPA038602, HPA0357592
zyg-11 related cell cycle regulator	1.18e-6	Anti-ZER1	HPA048464*
SH3 domain containing GRB2 like, endophilin B2	1.56e-6	Anti-SH3GLB2	HPA021438, HPA024734*
meiotic double-stranded break formation protein 1	1.59e-6	Anti-MEI1	HPA049240
coagulation factor VIII associated 1	1.67e-6	Anti-F8A1	HPA046960
DEAD-box helicase 49	2.01e-6	Anti-DDX49	HPA041870, HPA048093
solute carrier family 2 member 8	2.57e-6	Anti-SLC2A8	HPA011935
aldo-keto reductase family 1 member A1	2.66e-6	Anti-AKR1A1	HPA017919, HPA019649*
minichromosome maintenance complex component 5	2.81e-6	Anti-MCM5	HPA000845*, HPA052880
dual oxidase 1	4.31e-6	Anti-DUOX1	HPA023544
UBA domain containing 1	4.34e-6	Anti-UBAC1	HPA005651
L-antigen family member 3	5.29e-6	Anti-LAGE3	HPA036122, HPA036123

** Enhanced Validation*

Ovarian Cancer:
Unfavorable and Favorable Prognostic Genes

Ovarian cancer is the 7th most common cancer in women. Although it is the third most common gynecological cancer, after cervical and uterine cancer, ovarian cancer has the worst prognosis and the highest mortality rate.

Early age at menarche and late age at menopause increase the risk, while the number of pregnancies and breastfeeding have a protective effect.

Most ovarian cancers (90%) are of epithelial origin (ovarian carcinoma), while germ-cell and sex cord tumors are less common. Ovarian carcinoma is bilateral (involving both ovaries) in 30% to 50% of the cases.

Ovarian epithelial cancers are classified depending on histomorphologic features into:

- *Serous carcinoma* (high grade and low-grade) is the most common form of ovarian carcinoma (up to 75% of ovarian cancer).
- *Mucinous carcinoma* represents 35% of ovarian carcinomas endometrioid.
- *Endometrioid carcinoma* represents 10% of ovarian carcinomas.
- *Clear cell carcinoma* accounts for around 10% of ovarian carcinomas.

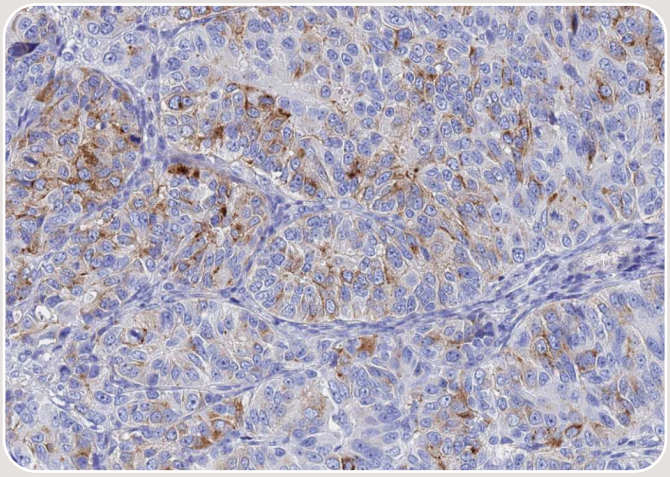
Diagnosis of ovarian cancer is often based on morphological features. Immunohistochemistry is used for better classification into subtypes, especially in the case of poorly differentiated tumors, and for excluding metastatic tumors.

The transcriptome analysis of the ovarian cancer proteome shows that 72% (n= 14467) of all human genes (n=20090) are expressed in ovarian cancer.

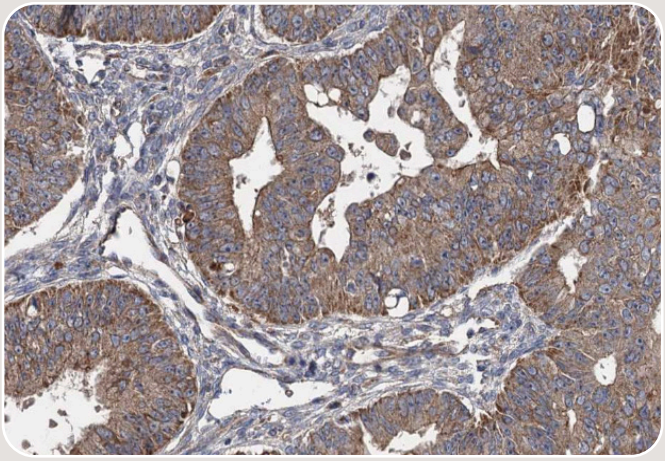
The Human Protein Atlas (HPA) has classified the genes associated with unfavorable and favorable prognoses in ovarian cancer. According to the Pathology section of the HPA in ovarian cancer, there are:

- **152** unfavorable genes
- **358** favorable genes

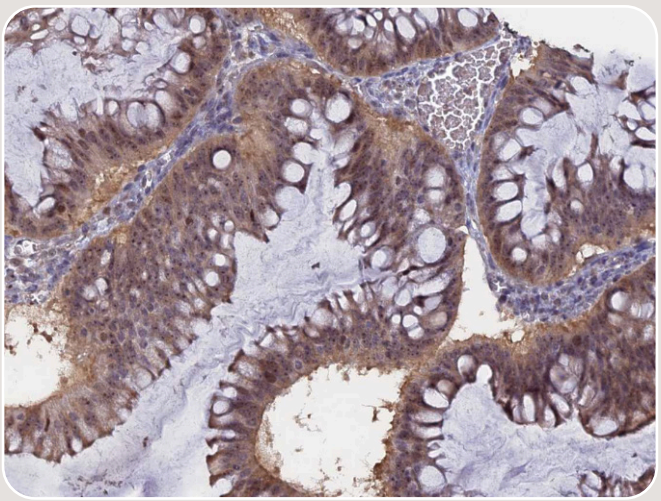
Table 3 lists the top 20 unfavorable and favorable prognostic genes detected in ovarian cancer and the corresponding Atlas Antibodies protein markers for IHC, WB, and ICC-IF.



Anti-CST4 (HPA044763) Unfavorable
Ovarian Cancer, Carcinoma Endometroid,



Anti-PPTC7 (HPA039335) Unfavorable
Ovarian cancer, Carcinoma Endometroid



Anti-FAM98C (HPA040930) Unfavorable
Ovarian cancer, Cystadenocarcinoma Mucinous

Table 3: Prognostic Genes in Ovarian Cancer and Corresponding Protein Markers

Top 20 UNFAVORABLE PROGNOSTIC genes in ovarian cancer	Prognostic p-value	Product Name	Product Number
peptidase inhibitor 3	3.84e-6	Anti-PI3	HPA017737*
FAM20C golgi associated secretory pathway kinase	9.40e-6	Anti-FAM20C	HPA019823
Fc fragment of IgG binding protein	9.70e-6	Anti-FCGBP	HPA003517*, HPA003564*
transforming growth factor beta induced	1.14e-5	Anti-TGFBI	HPA008612*, HPA017019*
RCC1 and BTB domain containing protein 1	1.21e-5	Anti-RCBTB1	HPA056783
protein phosphatase targeting COQ7	1.43e-5	Anti-PPTC7	HPA039335*, HPA040614*
solute carrier family 39 member 13	2.73e-5	Anti-SLC39A13	HPA043971
ArfGAP with FG repeats 1	3.43e-5	Anti-AGFG1	HPA008741
ribosomal protein L7a	3.60e-5	Anti-RPL7A	HPA046794
unc-5 netrin receptor B	3.80e-5	Anti-UNC5B	HPA076687
cystatin S	4.98e-5	Anti-CST4	HPA044763
FA complementation group D2	5.00e-5	Anti-FANCD2	HPA063742
receptor interacting serine/threonine kinase 4	6.22e-5	Anti-RIPK4	HPA030942*
diacylglycerol lipase beta	7.18e-5	Anti-DAGLB	HPA069377
pyruvate carboxylase	7.86e-5	Anti-PC	HPA043922*, HPA058765*
suppressor of glucose, autophagy associated 1	8.28e-5	Anti-SOGA1	HPA043992
family with sequence similarity 98 member C	8.51e-5	Anti-FAM98C	HPA040930, HPA041730*
ribosomal protein S6 kinase A2	8.63e-5	Anti-RPS6KA2	HPA045061, HPA054237
myb related transcription factor, partner of profilin	8.67e-5	Anti-MYPOP	HPA065307
keratin 7	9.42e-5	Anti-KRT7	AMAb91530*, HPA007272

Top 20 FAVORABLE PROGNOSTIC genes in ovarian cancer	Prognostic p-value	Product Name	Product Number
magnesium transporter MRS2	5.14e-11	Anti-MRS2	HPA017642
zinc finger protein 429	1.96e-8	Anti-ZNF429	HPA004139
tyrosyl-DNA phosphodiesterase 2	2.53e-7	Anti-TDP2	HPA074011
G protein-coupled receptor 27	1.21e-6	Anti-GPR27	HPA029395
mediator complex subunit 19	1.76e-6	Anti-MED19	HPA039912, HPA040860
chromosome 18 open reading frame 21	1.81e-6	Anti-C18orf21	HPA065505, HPA067322
acyl-CoA thioesterase 13	2.53e-6	Anti-ACOT13	HPA019881, HPA057134
ubiquitin conjugating enzyme E2 L3	3.82e-6	Anti-UBE2L3	HPA045609, HPA062415
kelch domain containing 9	4.20e-6	Anti-KLHDC9	HPA032058*, HPA043197*
adaptor related protein complex 1 sub sigma 2	5.53e-6	Anti-AP1S2	HPA049894*
arylacetamide deacetylase	5.58e-6	Anti-AADAC	HPA002911
formation of mitoch complex V factor 1 homol	5.63e-6	Anti-FMC1	HPA045663, HPA050553
family with sequence similarity 166 member B	6.20e-6	Anti-FAM166B	HPA045540*
zinc finger protein 85	6.45e-6	Anti-ZNF85	HPA044760
proline rich 3	6.49e-6	Anti-PRR3	HPA064061
coiled-coil domain containing 160	7.62e-6	Anti-CCDC160	HPA044684
small nuclear ribonucleoprotein D1 polypeptide	7.90e-6	Anti-SNRPD1	HPA040516
glutaredoxin 5 / C14orf8	1.08e-5	Anti-GLRX5	HPA042465*, HPA063716
zinc finger and SCAN domain containing 16	1.14e-5	Anti-ZSCAN16	HPA007290*
caspase activity and apoptosis inhibitor 1	1.27e-5	Anti-CAAP1	HPA020404*, HPA024100*

** Enhanced Validation*

References: validated products in selected publications (2011-2022)

Anti-ASS1 (HPA020934)
Endometrial cancer, unfavorable
Ji JX, et al. *Arginine Depletion Therapy with ADI-PEG20 Limits Tumor Growth in Argininosuccinate Synthase-Deficient Ovarian Cancer, Including Small-Cell Carcinoma of the Ovary, Hypercalcemic Type.* Clin Cancer Res. 2020 Aug 15;26(16):4402-4413

Anti-ATAD2 (HPA029424, AMAb90541)
Endometrial cancer, unfavorable
Wan WN, et al. *ATAD2 is highly expressed in ovarian carcinomas and indicates poor prognosis.* Asian Pac J Cancer Prev. 2014;15(6):2777-83

Zhang H, et al. *Long non-coding RNAs in HBV-related hepatocellular carcinoma (Review)*. Int J Oncol. 2020 Jan;56(1):18-32

Anti-AURKA (HPA002636)
Endometrial cancer, unfavorable
Zhan SJ, et al. *Identifying genes as potential prognostic indicators in patients with serous ovarian cancer resistant to carboplatin using integrated bioinformatics analysis.* Oncol Rep. 2018 Jun;39(6):2653-2663

Anti-BTN3A3 (HPA007904)
Ovarian cancer, favorable
Le Page C, et al. *BTN3A2 expression in epithelial ovarian cancer is associated with higher tumor infiltrating T cells and a better prognosis.* PLoS One. 2012;7(6):e38541

Anti-GCNT3 (HPA011154
Endometrial cancer, favorable
Fernández LP, et al. *The role of glycosyltransferase enzyme GCNT3 in colon and ovarian cancer prognosis and chemoresistance.* Sci Rep. 2018 May 31;8(1):8485

Anti-GGT7 (HPA013204)
Endometrial cancer, unfavorable
Grimm C, et al. *Association of gamma-glutamyltransferase with severity of disease at diagnosis and prognosis of ovarian cancer.* Br J Cancer. 2013 Aug 6;109(3):610-4

Anti-GZMA (HPA054134)
Endometrial cancer, favorable
Roufas C, et al. *The Expression and Prognostic Impact of Immune Cytolytic Activity-Related Markers in Human Malignancies: A Comprehensive Meta-analysis.* Front Oncol. 2018 Feb 21;8:27

Anti-HSDL2 (HPA050453)
Endometrial cancer, favorable
Sun Q, et al. *Role of Hydroxysteroid Dehydrogenase-Like 2 (HSDL2) in Human Ovarian Cancer.* Med Sci Monit. 2018 Jun 12;24:3997-4008

Anti-MCM3 (HPA004789)
Cervical cancer, favorable
Ehlén Å, et al. *RBM3-regulated genes promote DNA integrity and affect clinical outcome in epithelial ovarian cancer.* Transl Oncol. 2011 Aug;4(4):212-21

Nodin B, et al. *High MCM3 expression is an independent biomarker of poor prognosis and correlates with reduced RBM3 expression in a prospective cohort of malignant melanoma.* Diagn Pathol. 2012 Jul 17;7:82

Anti-MSX1 (HPA073604)
Endometrial cancer, favorable
Eppich S, et al. *MSX1-A Potential Marker for Uterus-Preserving Therapy of Endometrial Carcinomas.* Int J Mol Sci. 2020 Jun 25;21(12):4529

Anti-PIGR (HPA012012)
Endometrial cancer, favorable
Berntsson J, et al. *Expression and prognostic significance of the polymeric immunoglobulin receptor in epithelial ovarian cancer.* J Ovarian Res. 2014 Feb 26;7:26

Anti-PRF1 (HPA037940)
Endometrial cancer, favorable
Roufas C, et al. *The Expression and Prognostic Impact of Immune Cytolytic Activity-Related Markers in Human Malignancies: A Comprehensive Meta-analysis.* Front Oncol. 2018 Feb 21;8:27

Anti-PRR11 (HPA023923)
Endometrial cancer, unfavorable
Zhan Y, et al. *Proline-rich protein 11 overexpression is associated with a more aggressive phenotype and poor overall survival in ovarian cancer patients.* World J Surg Oncol. 2020 Dec 4;18(1):318

Anti-SCNN1A (HPA012743)
Ovarian cancer, unfavorable
Lou J, et al. *SCNN1A Overexpression Correlates with Poor Prognosis and Immune Infiltrates in Ovarian Cancer.* Int J Gen Med. 2022 Feb 18;15:1743-1763

Anti-STON2 (HPA003086)
Endometrial cancer, unfavorable
Sun X, et al. *Stonin 2 Overexpression is Correlated with Unfavorable Prognosis and Tumor Invasion in Epithelial Ovarian Cancer.* Int J Mol Sci. 2017 Jul 29;18(8):1653

Anti-TP53 (AMAb90956)
Endometrial cancer, favorable
Hedström E, et al. *Downregulation of the cancer susceptibility protein WRAP53β in epithelial ovarian cancer leads to defective DNA repair and poor clinical outcome.* Cell Death Dis. 2015 Oct 1;6(10):e1892

Enhanced Validation:
an additional layer of security in antibody validation

At Atlas Antibodies, we take great care to validate our antibodies in IHC, WB, and ICC-IF. Enhanced Validation is performed as an additional layer of security in an application and context-specific manner.

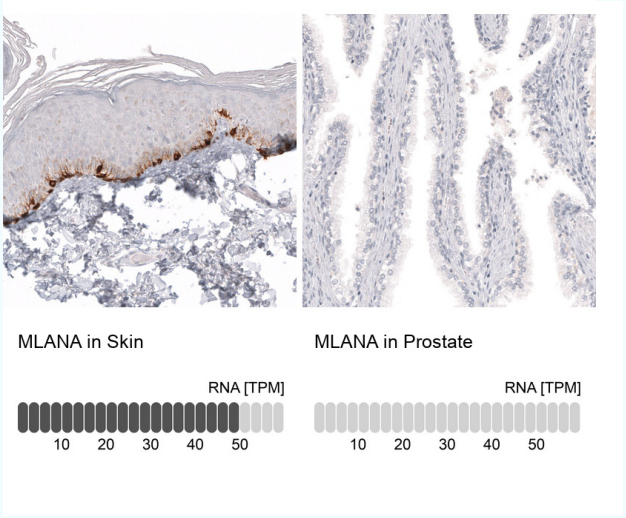
Enhanced Validation follows the guidelines proposed by the International Working Group for Antibody Validation (IWGAV) and published in Nature Methods*. By having all five methods recommended by IWGAV at our disposal, we have the power to validate a wide range of different antibodies.

* Uhlen, M., Bandrowski, A., Carr, S. et al. A proposal for validation of antibodies. Nat Methods 13, 823–827 (2016).

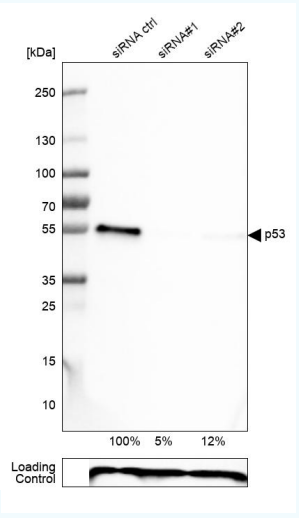
Enhanced validation offers increased security of antibody specificity in a defined context. By using 5 different enhanced validation methods we validate our antibodies for each combination of protein, sample, and application.

The 5 methods are:

- Genetic validation,
- Orthogonal validation,
- Validation by independent antibodies,
- Recombinant expression validation,
- Migration capture MS validation.



Example of **orthogonal validation in IHC** of protein expression using IHC by comparison of the staining signal to the RNA-seq data (TPM) of corresponding target in high and low expression tissues. The image shows the immunohistochemistry analysis in human skin and prostate tissues using the Anti-MLANA (AMAb91817) PrecisA Monoclonal antibody. Corresponding MLANA RNA-seq data (TPM) are presented for the same tissues.



Example of **genetic validation in WB** by siRNA knockdown. The image shows the Western blot analysis in U-251MG cells transfected with control siRNA, target specific siRNA probe #1 and #2, using the Anti-p53 (AMAb90956) PrecisA monoclonal antibody. Remaining relative intensity is presented. Loading control: Anti-PPIB.

VERY RELIABLE ANTIBODIES

Atlas Antibodies manufactures and provides over 21,000 highly validated monoclonal and polyclonal primary antibodies and control antigens targeting the majority of human proteins for tissue and cell analysis to explore and accelerate research in biology, pathology, and medicine. The portfolio covers different research areas such as neuroscience, cancer, cell biology, stem cell & development. All our products are rigorously evaluated for specificity, reproducibility and performance and characterized for use in IHC, WB, and ICC-IF. Enhanced validation is applied as an extra level of security of antibody specificity in a defined context. Available as 25 µL and 100 µL unit size.

CREATED BY THE HUMAN PROTEIN ATLAS

With our roots in the Human Protein Atlas project, an integration of antibody-based imaging, proteomics, and transcriptomics, our antibodies are affinity-purified, reproducible, selective, and specific for their target proteins through our enhanced validation process. Our Triple A Polyclonals™ are developed within the Human Protein Atlas project.

VALIDATED BY ENHANCED VALIDATION

We take great care to validate our antibodies in IHC, WB, and ICC-IF. Our antibodies are validated in all major human tissues and organs and 20 cancer tissues. Each antibody is supported by over 500 staining images. As an additional layer of security, we perform Enhanced Validation. By using 5 different enhanced validation methods we validate our antibodies for each combination of protein, sample, and application. Discover our Triple A Polyclonals™ and PrecisA Monoclonals™ antibodies targeting the majority of human proteins in cells, tissues, and organs.

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Atlas Antibodies Advanced Polyclonals.
Triple A Polyclonals™ are rabbit polyclonal primary antibodies developed within the Human Protein Atlas project. IHC characterization data from 44 normal and 20 cancer tissues is available on the Human Protein Atlas portal.

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PrecisA Monoclonals™ are mouse monoclonal primary antibodies developed against a number of carefully selected targets. Clones are selected to recognize only unique non-overlapping epitopes and isotypes.

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ATLAS ANTIBODIES

Atlas Antibodies AB
Voltavägen 13A
16869 Bromma, Sweden
atlasantibodies.com

Phone +46(0)8 54 59 58 50
contact@atlasantibodies.com
order@atlasantibodies.com
support@atlasantibodies.com