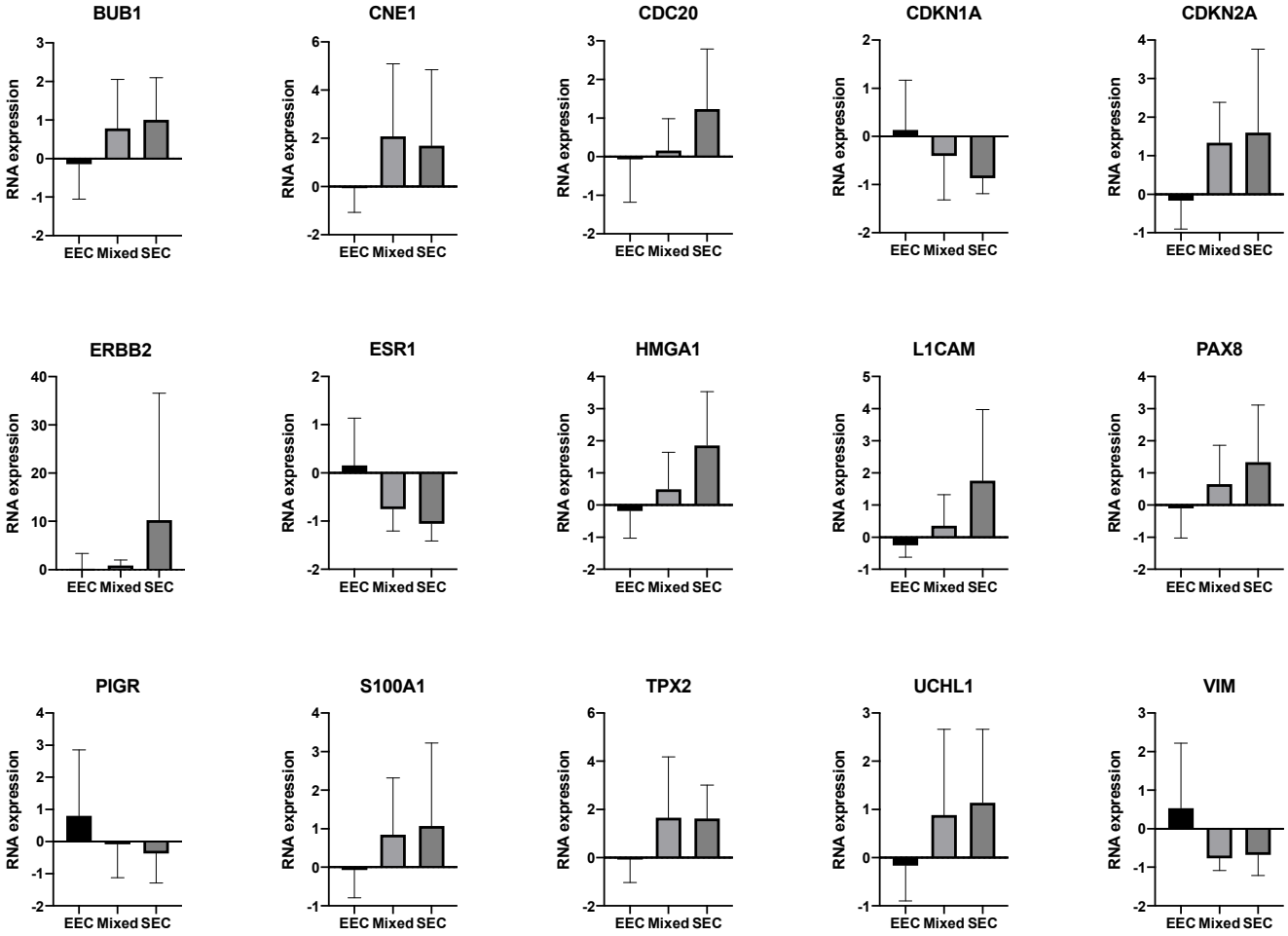


Figure Supplementary 1. Boxplots of the described validated biomarkers for histological type representing different non-endometrioid histologies as different entities (n=271 endometrioid (EEC) type, n=62 non-EEC type including n=10 mixed carcinomas, and n=52 serous (SEC) carcinomas).

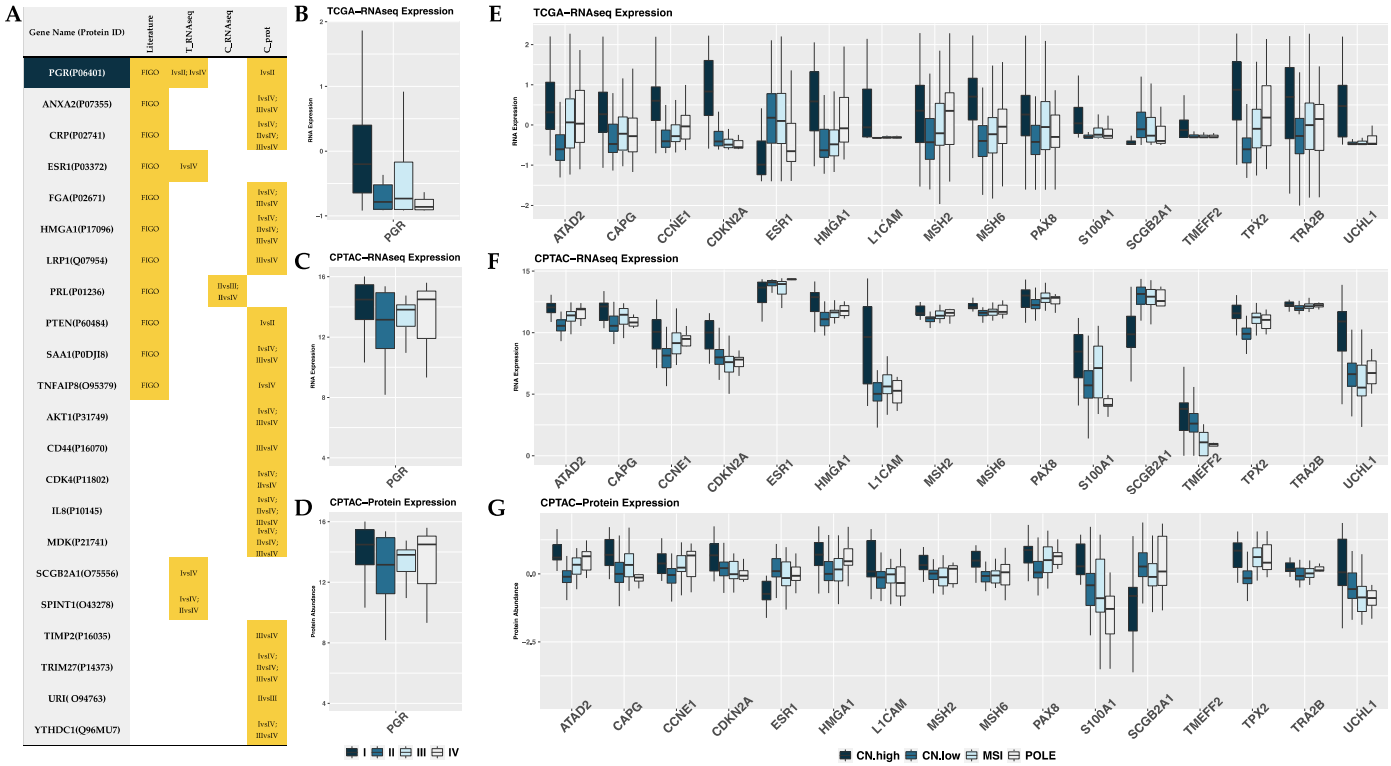
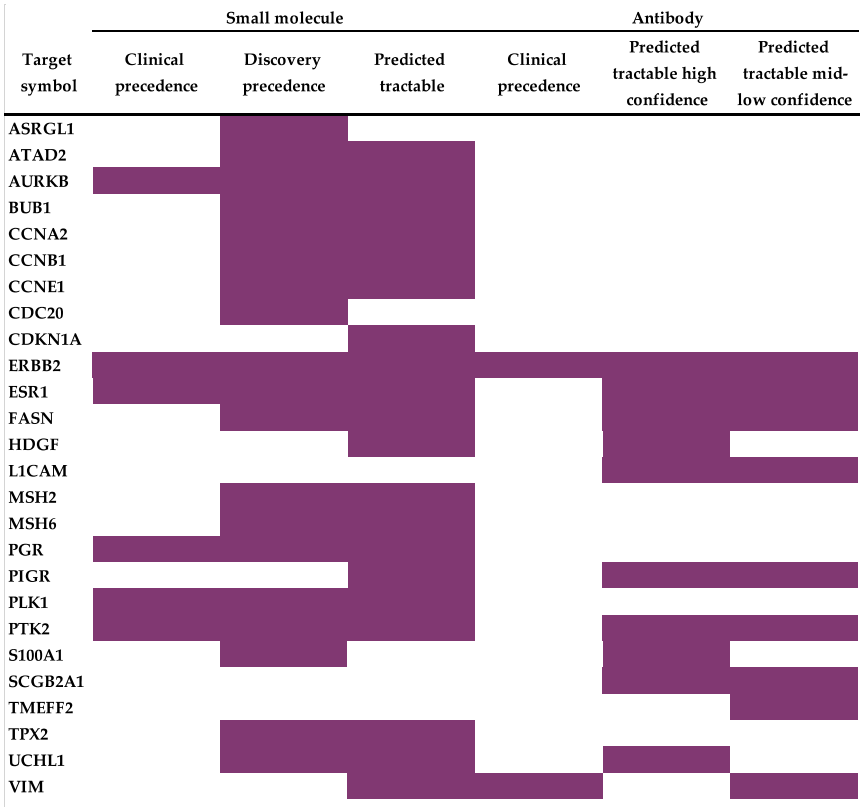


Figure Supplementary 2. Biomarkers related to FIGO stage with its respective boxplots, and molecular classification of the validated biomarkers. (**a**) Table of the proteins that were found differentially expressed between (**a**) Any of the FIGO stages in any of the tested cohorts. Highlighted in yellow, the specific cohort in which that protein was found to be differentially expressed between FIGO stages. Proteins highlighted in blue are those validated in more than one cohort, and therefore, the ones that we considered as validated biomarkers; (**b–d**) Boxplots showing the expression of the significant biomarkers for FIGO stage in each cohort of patients: TCGA RNA-Seq data, CPTAC RNA-Seq data, and CPTAC proteomic data, respectively; (**e–g**) Boxplots showing the expression of the significant biomarkers for molecular classification in each cohort of patients: TCGA RNA-Seq data, CPTAC RNA-Seq data, and CPTAC proteomic data, respectively. *Literature: literature revision from Coll-de la Rubia E et al., 2020* [1]; *T_RNAseq: RNA-Seq data of the TCGA's cohort; C_RNAseq: RNA-Seq data of the CPTAC's cohort; C_prot: proteomic data of the CPTAC's cohort.*

	Function [CC] - Uniprot	EMT - EMTome	Cancer prognostic summary - The Human Protein Atlas	
Gene Name	**Function**	**EMT-related proteins**	**Favorable**	**Unfavorable**
ASRGL1	Has both L-asparaginase and beta-aspartyl peptidase activity.	No	colorectal, renal	liver
ATAD2	Involved in the estrogen-induced cell proliferation and cell cycle progression of breast cancer cells.	No		lung, renal
BUB1	Serine/threonine-protein kinase that performs 2 crucial functions during mitosis: it is essential for spindle-assembly checkpoint signaling and for correct chromosome alignment.	No		liver, pancreatic
CAPG	Calcium-sensitive protein which reversibly blocks the barbed ends of actin filaments but does not sever preformed actin filaments.	Yes	renal	liver
CCNE1	Essential for the control of the cell cycle at the G1/S (start) transition.	No		liver, **ovarian**
CDC20	Required for full ubiquitin ligase activity of the anaphase promoting complex/cyclosome (APC/C).	No		liver, pancreatic, renal
CDKN1A	Binds to and inhibits cyclin-dependent kinase activity, preventing phosphorylation of critical cyclin-dependent kinase substrates and blocking cell cycle progression.	Yes	renal	lung
CDKN2A	Acts as a negative regulator of the proliferation of normal cells by interacting strongly with CDK4 and CDK6.	Yes	head and neck	liver, renal
ERBB2	Protein tyrosine kinase that is part of several cell surface receptor complexes, but that apparently needs a coreceptor for ligand binding. In the nucleus is involved in transcriptional regulation. Involved in the transcription of rRNA genes by RNA Pol I and enhances protein synthesis and cell growth.	Yes	renal	pancreatic
ESR1	Nuclear hormone receptor. The steroid hormones and their receptors are involved in the regulation of eukaryotic gene expression and affect cellular proliferation and differentiation in target tissues. Also mediates membrane-initiated estrogen signaling involving various kinase cascades.	Yes		
FASN	Fatty acid synthetase is a multifunctional enzyme that catalyzes the de novo biosynthesis of long-chain saturated fatty acids starting from acetyl-CoA and malonyl-CoA in the presence of NADPH.	No		**cervical**, renal
HDGF	[Isoform 1]: Acts as a transcriptional repressor. Has mitogenic activity for fibroblasts. Heparin-binding protein.	Yes	**ovarian**	liver
HMGA1	HMG-I/Y bind preferentially to the minor groove of A+T rich regions in double-stranded DNA.They are also involved in the transcription regulation of genes containing, or in close proximity to A+T-rich regions.	Yes		liver, lung, pancreatic
L1CAM	Neural cell adhesion molecule involved in the dynamics of cell adhesion and in the generation of transmembrane signals at tyrosine kinase receptors.	Yes		head and neck, lung, renal
MACC1	Acts as a transcription activator for MET and as a key regulator of HGF-MET signaling. Promotes cell motility, proliferation and hepatocyte growth factor (HGF)-dependent.	Yes	renal	
MCM6	Acts as component of the MCM2-7 complex (MCM complex) which is the putative replicative helicase essential for 'once per cell cycle' DNA replication initiation and elongation in eukaryotic cells.	No		liver, melanoma, renal
MCM7	Acts as component of the MCM2-7 complex (MCM complex) which is the putative replicative helicase essential for 'once per cell cycle' DNA replication initiation and elongation in eukaryotic cells. Required for S-phase checkpoint activation upon UV-induced damage.	Yes	**cervical**	liver
MSH2	Component of the post-replicative DNA mismatch repair system (MMR).	No		liver, pancreatic
MSH6	Component of the post-replicative DNA mismatch repair system (MMR).	No		liver, renal
PAX8	Transcription factor for the thyroid-specific expression of the genes exclusively expressed in the thyroid cell type, maintaining the functional differentiation of such cells.	No		
PGR	The steroid hormones and their receptors are involved in the regulation of eukaryotic gene expression and affect cellular proliferation and differentiation in target tissues.	Yes		
PIGR	Mediates selective transcytosis of polymeric IgA and IgM across mucosal epithelial cells. Binds polymeric IgA and IgM at the basolateral surface of epithelial cells.	No	**breast**, renal	
PTK2	Non-receptor protein-tyrosine kinase that plays an essential role in regulating cell migration, adhesion, spreading, reorganization of the actin cytoskeleton, formation and disassembly of focal adhesions and cell protrusions, cell cycle progression, cell proliferation and apoptosis.	Yes		**breast**
S100A1	Small calcium binding protein that plays important roles in several biological processes such as Ca(2+) homeostasis, chondrocyte biology and cardiomyocyte regulation.	No		renal
SCGB2A1	May bind androgens and other steroids, may also bind estramustine, a chemotherapeutic agent used for prostate cancer. May be under transcriptional regulation of steroid hormones.	No	colorectal, renal	
TMEFF2	May be a survival factor for hippocampal and mesencephalic neurons. The shedded form up-regulates cancer cell proliferation, probably by promoting ERK1/2 phosphorylation.	No	Gene product is not prognostic	
TPX2	Spindle assembly factor required for normal assembly of mitotic spindles.	No		liver, lung, pancreatic, renal
TRA2B	Sequence-specific RNA-binding protein which participates in the control of pre-mRNA splicing. Can either activate or suppress exon inclusion.	No	**ovarian**	liver
UCHL1	Ubiquitin-protein hydrolase involved both in the processing of ubiquitin precursors and of ubiquitinated proteins (Probable). This enzyme is a thiol protease that recognizes and hydrolyzes a peptide bond at the C-terminal glycine of ubiquitin. Also binds to free monoubiquitin and may prevent its degradation in lysosomes (By similarity).	Yes		urothelial
VIM	Vimentins are class-III intermediate filaments found in various non-epithelial cells, especially mesenchymal cells. Vimentin is attached to the nucleus, endoplasmic reticulum, and mitochondria, either laterally or terminally.	Yes		renal

Figure Supplementary 3. Description of the functions of the proteins described as validated biomarkers in our study, their relation to the epithelial-mesenchymal transition, and their prognostic behavior in other types of cancer. Highlighted in bold are gynecological cancers in which a prognostic association of that specific protein has been described. Source: Uniprot [2], EMTome [3], and The Human Protein Atlas (www.proteinatlas.org).



AURKB	AT-9283 (multiple myeloma); TOZASERTIB (leukemia); DANUSERTIB (multiple myeloma); ENMD-2076 (soft tissue sarcoma); BI-811283 (acute myeloid leukemia); BARASERTIB (acute myeloid leukemia); CHIAURANIB (ovarian cancer); ILORASERTIB (cancer); TAK-901 (acute myeloid leukemia); SNS-314 (neoplasm); KW-2449 (acute myeloid leukemia); CENISERTIB (lymphoid neoplasm); AMG-900 (cancer); CYC-116 (neoplasm); TTP-607 (lymphoma); GSK-1070916 (neoplasm); MK-6592 (neoplasm); PF-03814735 (neoplasm)
ERBB2 (Small molecules)	AFATINIB (non-small cell lung carcinoma); NERATINIB (neoplasm); VANDETANIB (thyroid cancer); LAPATINIB (neoplasm); DACOMITINIB (non-small cell lung carcinoma); TUCATINIB (HER2 Positive Breast Carcinoma); PYROTINIB (breast cancer); TESEVATINIB (non-small cell lung carcinoma); POZIOTINIB (non-small cell lung carcinoma); VARLITINIB (cholangiocarcinoma); BMS-690514 (non-small cell lung carcinoma); SAPITINIB (breast cancer); CP-724714 (metastasis); CANERTINIB (breast neoplasm); HEMAY-022 (breast cancer); CUDC-101 (head and neck malignant neoplasia); AEE-788 (glioblastoma multiforme); MUBRITINIB (breast neoplasm); AC-480 (cancer); TAK-285 (cancer); MP-412 (neoplasm); JNJ-26483327 (cancer)
ERBB2 (Antibodies)	TRASTUZUMAB EMTANSINE (neoplasm); TRASTUZUMAB (breast carcinoma); ; PERTUZUMAB (neoplasm); TRASTUZUMAB DERUXTECAN (breast cancer); MARGETUXIMAB (breast cancer); ERTUMAXOMAB (breast cancer); GANCOTAMAB (breast cancer); T-DM1 (breast cancer)
ESR1	ESTRADIOL (hypogonadism); ESTRADIOL VALERATE (infertility); BAZEDOXIFENE (obesity); CLOMIPHENE (anovulation); FULVESTRANT (breast carcinoma); ETHINYL ESTRADIOL (infertility); TOREMIFENE (breast carcinoma); ESTROGENS, CONJUGATED (postmenopausal osteoporosis); TAMOXIFEN (breast cancer); DIETHYLSTILBESTROL (neoplasm); ESTRIOL (urinary tract infection); POLYESTRADIOL PHOSPHATE (neoplasm); DIETHYLSTILBESTROL DIPHOSPHATE (neoplasm); OSPEMIFENE (sexual dysfunction); LASOFOXIFENE (osteoporosis); ARZOXIFENE (postmenopausal osteoporosis); SYNTHETIC CONJUGATED ESTROGENS, B (menopause); AFIMOXIFENE (breast ductal carcinoma in situ); RAD1901 (Hot flashes); FISPEMIFENE (hypogonadism); BRILANESTRANT (breast cancer); ESTROGENS, ESTERIFIED (breast cancer); SR16234 (breast cancer); ESTRONE (obesity); GTX-758 (prostate cancer); ACOLBIFENE (breast cancer)
PGR	PROGESTERONE (infertility); ULIPRISTAL (uterine fibroid); NORETHINDRONE ACETATE (hypogonadism); ULIPRISTAL ACETATE (uterine fibroid); DROSPIRENONE (Dysmenorrhea); DYDROGESTERONE (premature birth); LEVONORGESTREL (Menorrhagia); HYDROXYPROGESTERONE CAPROATE (premature birth); MEDROXYPROGESTERONE ACETATE (hemorrhage); CYPROTERONE ACETATE (acne); DESOGESTREL (uterine fibroid); ETONOGESTREL (HIV infection); MEGESTROL ACETATE (precocious puberty); MIFEPRISTONE (persian gulf syndrome); NORGESTIMATE (acne); NORETHINDRONE (postpartum depression); TELAPRISTONE ACETATE (uterine fibroid); DANAZOL (diabetic macular edema); ASOPRISNIL (leiomyoma); NORELGESTROMIN (Metrorrhagia); NORGESTREL (endometrial cancer); LONAPRISAN (breast cancer); PF-05019702 (uterine fibroid); ONAPRISTONE (neoplasm)
PLK1	VOLASERTIB (acute myeloid leukemia); BI-2536 (acute myeloid leukemia); ONVANSERTIB (prostate cancer); TAK-960 (cancer); MK-1496 (neoplasm); GSK-461364 (non-Hodgkins lymphoma); CAFUSERTIB (acute myeloid leukemia)
PTK2	DEFACTINIB (pancreatic ductal adenocarcinoma); GSK-2256098 (pancreatic adenocarcinoma); VS-4718 (pancreatic carcinoma); CEP-37440 (neoplasm); BI-853520 (neoplasm)
VIM	PRITUMUMAB (glioma)

Figure Supplementary 4. Available drugs against validated proteins divided in small molecules and antibodies. A description of current clinical applications with the commercial names is given below. Source: Open Target Platform [4].

References

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4. Ochoa, D.; Hercules, A.; Carmona, M.; Suveges, D.; Gonzalez-Uriarte, A.; Malangone, C.; Miranda, A.; Fumis, L.; Carvalho-Silva, D.; Spitzer, M.; et al. Open Targets Platform: Supporting systematic drug-target identification and prioritisation. *Nucleic Acids Res.* **2021**, *49*, D1302–D1310, doi:10.1093/nar/gkaa1027.