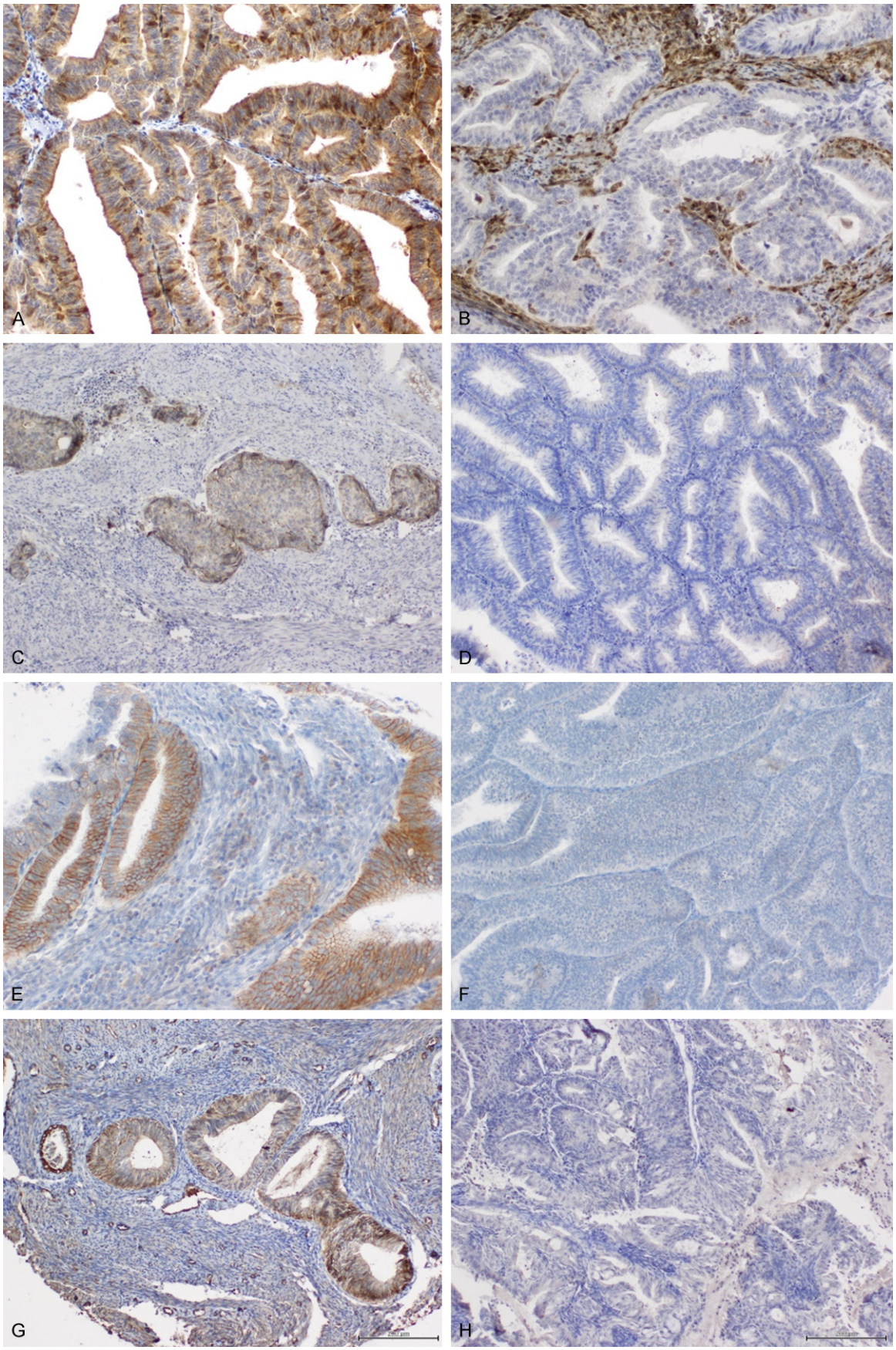
Table S1. Immunohistochemistry staining details

Antibody	Clone	Manufacturer	Dilution	Antigen retrival	Incubation	Kit
ESR1	SP1	Roche	ready to use	Benchmark's protocol		ultraView
PGR	1E2	Roche	ready to use	Benchmark's protocol		ultraView
ERBB1	EGFR113	Novocastra	1:20	pH=9 (DAKO S3267), heat induced	90 min, room temperature	Novolink
HER2	4B5	Roche	ready to use	Benchmark's protocol		ultraView
ERBB3	DAK-H3-IC	DAKO	1:50	pH=9 (DAKO S3267), heat induced	90 min, room temperature	Novolink
ERBB4	HFR1	Abcam	1:50	pH=6.1 (DAKO S1699), heat induced	90 min, room temperature	Novolink
PIK3CA	C73F8	Cell Signaling	1:50	pH=6.1 (DAKO S1699), heat induced	90 min, room temperature	Novolink
pAKT1	D9E	Cell Signaling	1:20	pH=6.1 (DAKO S1699), heat induced	90 min, room temperature	Novolink
STMN1	EPR1574	Abcam	1:400	pH=6.1 (DAKO S1699), heat induced	90 min, room temperature	Novolink
PTEN	6H2.1	DAKO	1:200	pH=6.1 (DAKO S1699), heat induced	90 min, room temperature	Novolink
TP53	BP-53-11	Roche	ready to use	Benchmark's protocol		ultraView
MLH1	M1	Roche	ready to use	Benchmark's protocol		ultraView
MSH2	G219-1129	Roche	ready to use	Benchmark's protocol		ultraView
MYC	9E11	Novocastra	1:100	pH=6.1 (DAKO S1699), heat induced	90 min, room temperature	Novolink
TOP2A	Ki-S1	DAKO	1:200	pH=6.1 (DAKO S1699), heat induced	90 min, room temperature	Novolink
CDKN2A	JC8	Santa Cruz	1:200	pH=6.1 (DAKO S1699), heat induced	90 min, room temperature	Novolink
RAD21	Polyclonal	Abcam	1:500	pH=6.1 (DAKO S1699), heat induced	90 min, room temperature	Novolink
RUNX1	DW71	Santa Cruz	1:50	pH=6.1 (DAKO S1699), heat induced	90 min, room temperature	Novolink

Table S2. Details of immunohistochemical evaluation

Evaluated protein	Staining localisation	Staining intensity	% of stained cells
ER	nucleus	Allred score*	
PR	nucleus	Allred score	
HER2	membrane	HercepTest**	
ERBB1	membrane	HercepTest***	
ERBB3	cytoplasm	assessed	not assessed****
ERBB4	cytoplasm	assessed	not assessed
PIK3CA	cytoplasm	assessed	not assessed
pAKT1	cytoplasm, nucelus	assessed (sum of intensities)	not assessed
STMN1	cytoplasm	assessed	assessed
PTEN	cytoplasm, nucelus	not assessed	assessed
TP53	nucleus	assessed	assessed
MLH1	nucleus	not assessed	assessed
MSH2	nucleus	not assessed	assessed
MYC	cytoplasm	assessed	assessed
TOP2A	nucleus	not assessed	assessed
CDKN2A	cytoplasm, nucleus	assessed	assessed
RAD21	nucleus	assessed	not assessed
RUNX1	cytoplasm	assessed	assessed

*The score of staining intensity (0-3) and the % of the stained cells (divided into 5 intervals - 1: 0-1%, 2: 2-10%, 3: 11-33%, 4: 34-66%, 5: 67-100%). **Score ranging from 0 to 3, with 3 defined as "A strong complete membrane staining observed in more than 10% of the tumor cells". ***modification: cut-off 1% instead of 10%. ****not assessed-homogenous staining or equal staining intensity in all specimen.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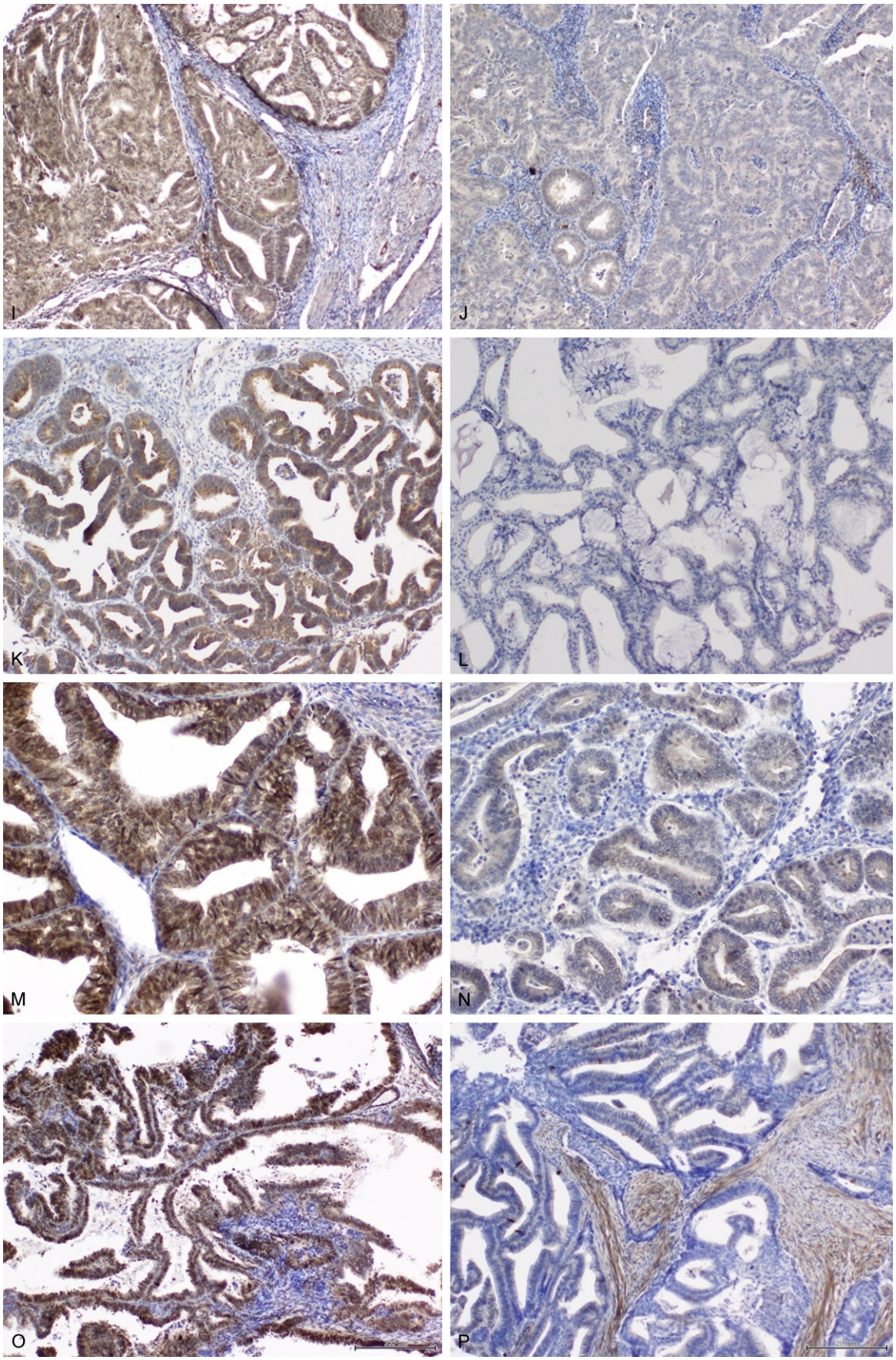
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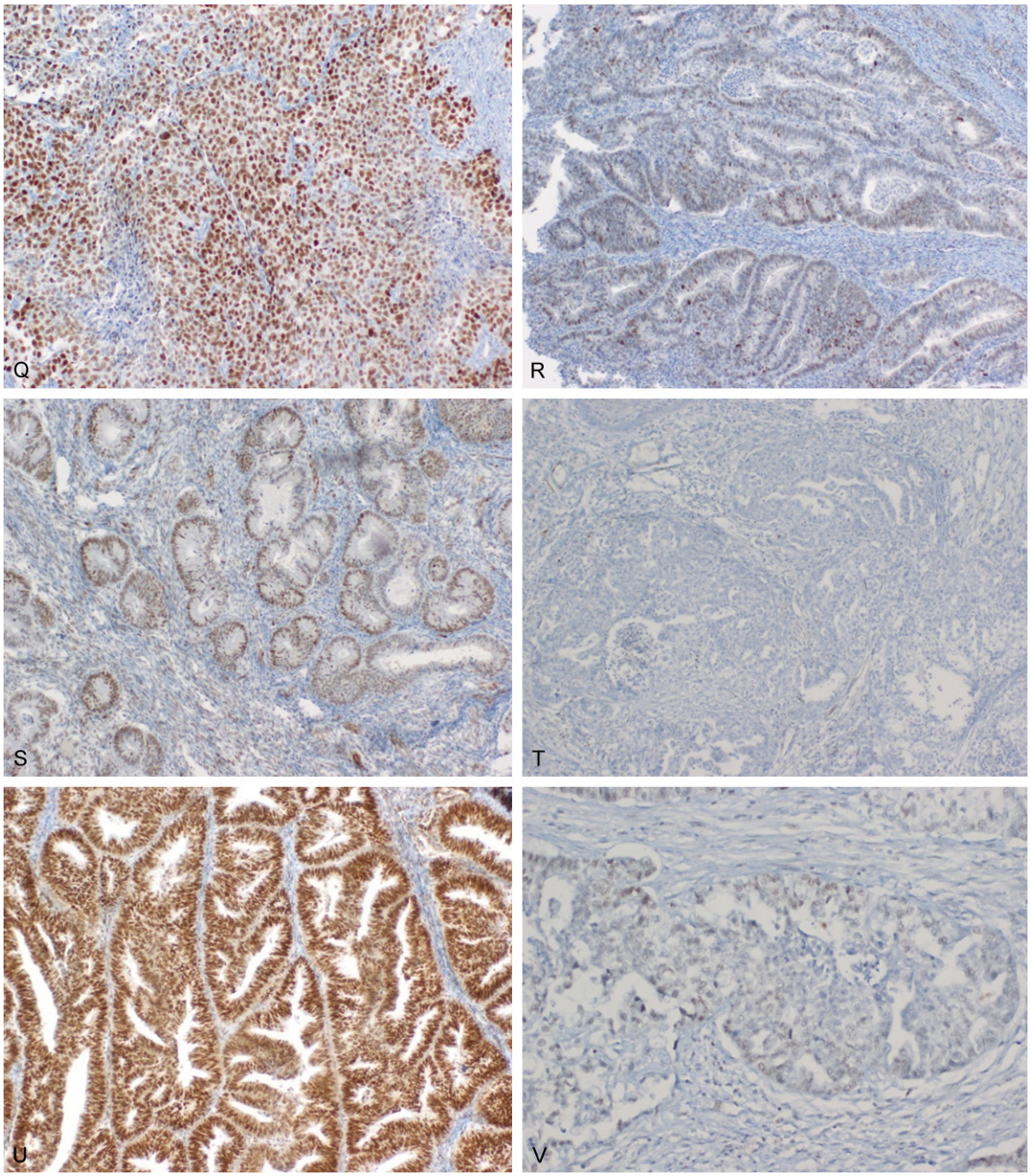

Figure S1. Representative immunohistochemistry images of: A. Positive PTEN staining; B. Negative PTEN staining; C. Positive ERBB1 staining; D. Negative ERBB1 staining; E. positive HER2 staining; F. Negative HER2 staining; G. Positive ERBB3 staining; H. Negative ERBB3 staining; I. Positive ERBB4 staining; J. Negative ERBB4 staining; K. Positive PI3K staining; L. Negative PI3K staining; M. Positive pAKT1 staining; N. Negative pAKT1 staining; O. Positive STMN1 staining; P. Negative STMN1 staining; Q. Positive TP53 staining; R. Negative TP53 staining; S. Positive MLH1 staining; T. Negative MLH1 staining; U. Positive MSH2 staining; V. Negative MSH2 staining.