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Assessors' report for cIQc Run 34: Breast Module (ER, PR and HER2)

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Assessment performed on Thursday, March 20, 2014 and Tuesday, April 1, 2014, at Vancouver General Hospital

N.B. This is the last assessment report before financial support for cIQc from the Canadian Partnership Against Cancer starts, and we anticipate that henceforth we will be able to issue assessment reports more quickly, allowing more rapid feedback to participating laboratories. For example, the assessment meeting for Run 35 (IDH1 immunostaining) has taken place already and a report will be issued shortly.

Overview

Participating laboratories were asked to stain a tissue microarray consisting of 46 single-core breast carcinoma specimens. Overall, self-assessments from participating labs were very good. All slides from Lab 173 were unfortunately shattered during return shipping, as was the HER2 slide from Lab 152. Slides from Labs 106, 107, 116, 120, 122, 124, 126, 132, 136, 141, 168, 191, 202, 207 (except PR) and 208 were not returned to cIQc in time for the assessment meetings. Available slides from all other participating labs were blindly reviewed by cIQc assessors. Independent review led to occasional alteration of original self-reported results for certain discordant cores due to 1) an obvious data entry error or 2) a score was deemed to be discordant between self-assessment and final cIQc review then re-classified based on cIQc assessor consensus.

ER: ER staining by participating laboratories continues to be excellent, overall. Core 25 was excluded from all analyses due to high dropout, while Core 33 was excluded from all analyses due to borderline ER positivity and true staining heterogeneity observed by cIQc assessors that led to multiple discordant results from the reference laboratory (R1). Assessors also noted that Core 31 generally had weak nuclear staining in most labs (Labs 119, 123, 128, 138, 157, 165, 167, 178, 180, 184, 199 and 209) that was deemed to be incorrectly interpreted as negative during self-assessment.

Unless specified below, the majority of participating labs exhibited **optimal** ER staining. Labs 103, 129, 170, 175, 183 and 199 had **technically optimal** staining, but two or more interpretive errors (e.g. stromal cell or lymphocyte staining was reported as ER positivity in tumour cells during self-assessment) after cIQc independent review. Labs 167, 184, 187 and 188 were considered to have **technically adequate** ER staining due to overall weaker staining intensity compared to all other labs. For instance, labs with technically adequate staining demonstrated weak positive nuclear staining in Core 12 that was incorrectly reported as negative during self-assessment. Similarly, labs with technically adequate staining also exhibited very weak staining or a false negative in Core 31. Both Cores 12 and 31 from Lab 198 were confirmed to be negative for ER staining by cIQc assessors. As the only lab with two false negatives after cIQc independent review, Lab 198 was considered to have **suboptimal** ER staining.



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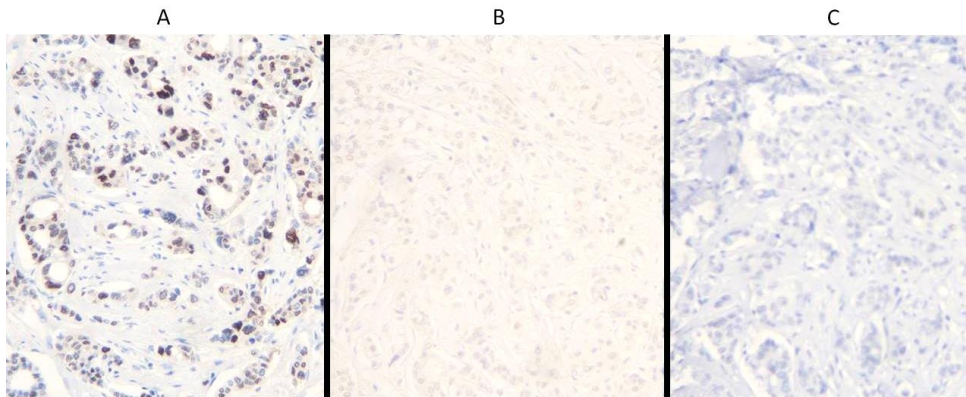


FIGURE 1. Representative ER staining in Core 12 (A). Lab 188 weak positive ER staining in Core 12 (B). Lab 198 negative staining in Core 12 (C).

PR: PR staining continues to show more variability than ER or HER2, making assessment of adequacy problematic. Cores 25 and 41 were excluded from all analyses due to high dropout. Assessors noted that Core 4 generally comprised of a mix of stained benign and tumour cells that complicated interpretation and led many participants (Labs 114, 127, 128, 129, 134, 138, 151, 153, 167, 190, 192, 194 and 207) to incorrectly report it as negative during self-assessment. Assessors also noted that Core 42 generally had borderline PR positivity with only a few tumour cells present.

Unless specified below, the majority of participating labs exhibited **optimal** PR staining. Labs 103, 109, 113 and 117 had **technically optimal** staining, but two or more interpretive errors that involved reporting of staining in benign cells. Lab 119 was deemed to have **technically adequate** staining since cIQc assessors noted generally higher cytoplasmic background staining in all cores compared to other labs. False positive PR staining was observed in Lab 129 (Cores 22 and 33), 135 (Core 22) and 184 (Core 33), with the latter exhibiting the highest cytoplasmic background staining of all participants. Conversely, false negative staining was observed in Lab 138 (Core 11), 198 (Core 11) and 207 (Core 30).

HER2: Overall, the quality of HER2 staining was excellent. Cores 21, 25 and 39 were excluded from all analyses due to high dropout, while Core 8 was excluded due to true staining heterogeneity observed by cIQc assessors that led to multiple discordant results from the reference laboratory (R1). In general, a qualitative assessment of staining by all participating labs was performed and cIQc assessors primarily focused review on HER2 3+ cases (Cores 9, 17, 31 and 40).

Unless specified below, the majority of participating labs exhibited **optimal** HER2 staining (assuming that 2+ cases would be sent for further testing to determine amplification status). Labs 113, 129, 135, 147 and 160 had **technically optimal** staining, but generally increased cytoplasmic and/or nuclear background staining. Labs 145, 167, 188 and 199 were also considered to have **technically optimal** staining, but generally weaker in intensity compared to most other labs. Lab 151 was deemed to have **technically adequate** staining since cIQc assessors noted very high background staining in all cores, leading to a false 3+ in Core 5. Due to very weak HER2 staining intensity overall (yet strong counterstaining), Lab 153 was considered to have **suboptimal** staining that led to the sole false negative (Core 17) in the entire challenge. Lab 186 was also deemed to have **suboptimal** staining that was very intense with excessive background (despite that self-assessment results having perfect concordance with the reference lab (R1)).



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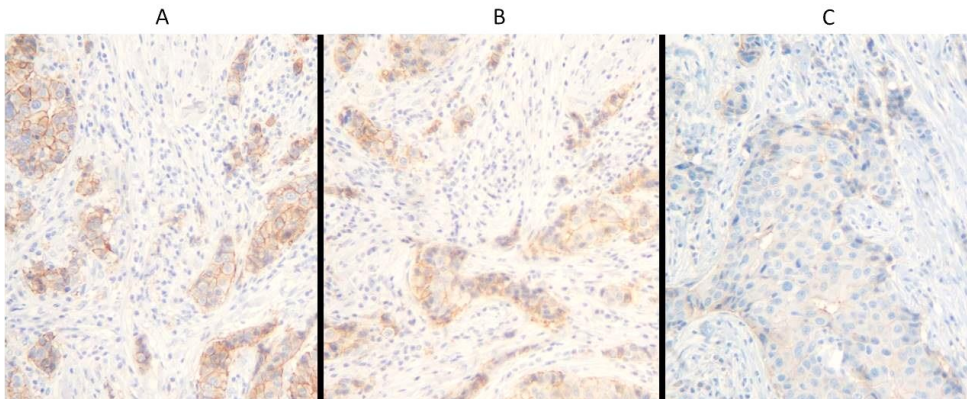


FIGURE 2. Representative HER2 3+ (A) and 2+ (B) staining in Core 17. HER2 1+ staining by Lab 153 in Core 17 (C).

Corrected Garrattograms for ER, PR and HER2 are provided in Supplementary Figures 1 to 3. Supplementary Tables 1 to 3 summarize kappa agreement values, sensitivity and specificity of each participating laboratory based on self-assessment and cIQc assessment. Quality control methodologies of immunohistochemical assessment are evolving, and numeric results should be interpreted with this reservation. Supplementary Tables 4 to 6 summarizing staining protocols can also be found at the end of this document. Your regular participation in cIQc is greatly appreciated and we look forward to continually working with you and the Canadian Association of Pathologists – Association Canadienne des Pathologistes.

Table S1. ER descriptive statistics generated from self-assessment and cIQC assessment.

Lab ID	Self-assessment									Lab ID	cIQC Assessment								
	Total n	% Scorable	Pairwise Complete Observations	Concordance with Reference (%)	Sensitivity	Specificity	PPV (positive predictive value)	NPV (negative predictive value)	Cohen's kappa		Total n	% Scorable	Pairwise Complete Observations	Concordance with Reference (%)	Sensitivity	Specificity	PPV (positive predictive value)	NPV (negative predictive value)	Cohen's kappa
101	44	88.64	38	38/38 (100%)	1	1	1	1	1	101	44	88.64	38	38/38 (100%)	1	1	1	1	1
102	44	100	43	43/43 (100%)	1	1	1	1	1	102	44	100	43	43/43 (100%)	1	1	1	1	1
103	44	100	43	39/43 (91%)	1	0.5	0.9	1	0.62	103	44	95.45	41	41/41 (100%)	1	1	1	1	1
105	44	95.45	41	41/41 (100%)	1	1	1	1	1	105	44	95.45	41	41/41 (100%)	1	1	1	1	1
106	44	95.45	41	41/41 (100%)	1	1	1	1	1	106	44	95.45	41	41/41 (100%)	1	1	1	1	1
107	44	97.73	42	40/42 (95%)	0.94	1	1	0.78	0.85	107	44	97.73	42	40/42 (95%)	0.94	1	1	0.78	0.85
109	44	95.45	41	41/41 (100%)	1	1	1	1	1	109	44	95.45	41	41/41 (100%)	1	1	1	1	1
111	44	90.91	39	39/39 (100%)	1	1	1	1	1	111	44	90.91	39	39/39 (100%)	1	1	1	1	1
112	44	95.45	41	41/41 (100%)	1	1	1	1	1	112	44	95.45	41	41/41 (100%)	1	1	1	1	1
113	44	90.91	39	39/39 (100%)	1	1	1	1	1	113	44	90.91	39	39/39 (100%)	1	1	1	1	1
114	44	100	43	43/43 (100%)	1	1	1	1	1	114	44	100	43	43/43 (100%)	1	1	1	1	1
115	44	95.45	41	41/41 (100%)	1	1	1	1	1	115	44	95.45	41	41/41 (100%)	1	1	1	1	1
116	44	90.91	39	39/39 (100%)	1	1	1	1	1	116	44	90.91	39	39/39 (100%)	1	1	1	1	1
117	44	93.18	40	40/40 (100%)	1	1	1	1	1	117	44	93.18	40	40/40 (100%)	1	1	1	1	1
119	44	88.64	38	37/38 (97%)	0.97	1	1	0.86	0.91	119	44	88.64	38	38/38 (100%)	1	1	1	1	1
120	44	90.91	39	36/39 (92%)	0.94	0.86	0.97	0.75	0.75	120	44	90.91	39	36/39 (92%)	0.94	0.86	0.97	0.75	0.75
122	44	84.09	36	36/36 (100%)	1	1	1	1	1	122	44	84.09	36	36/36 (100%)	1	1	1	1	1
123	44	84.09	36	35/36 (97%)	0.97	1	1	0.86	0.91	123	44	84.09	36	36/36 (100%)	1	1	1	1	1
124	44	93.18	40	38/40 (95%)	0.94	1	1	0.78	0.84	124	44	93.18	40	38/40 (95%)	0.94	1	1	0.78	0.84
125	44	88.64	38	38/38 (100%)	1	1	1	1	1	125	44	88.64	38	38/38 (100%)	1	1	1	1	1
126	44	95.45	41	41/41 (100%)	1	1	1	1	1	126	44	95.45	41	41/41 (100%)	1	1	1	1	1
127	44	97.73	42	42/42 (100%)	1	1	1	1	1	127	44	97.73	42	42/42 (100%)	1	1	1	1	1
128	44	84.09	36	32/36 (89%)	0.9	0.86	0.96	0.67	0.68	128	44	81.82	35	35/35 (100%)	1	1	1	1	1
129	44	81.82	35	33/35 (94%)	0.93	1	1	0.71	0.8	129	44	77.27	33	33/33 (100%)	1	1	1	1	1
132	44	97.73	42	42/42 (100%)	1	1	1	1	1	132	44	97.73	42	42/42 (100%)	1	1	1	1	1
133	44	97.73	42	42/42 (100%)	1	1	1	1	1	133	44	97.73	42	42/42 (100%)	1	1	1	1	1
134	44	97.73	42	42/42 (100%)	1	1	1	1	1	134	44	97.73	42	42/42 (100%)	1	1	1	1	1
135	44	97.73	42	42/42 (100%)	1	1	1	1	1	135	44	97.73	42	42/42 (100%)	1	1	1	1	1
136	44	95.45	41	38/41 (93%)	0.91	1	1	0.73	0.8	136	44	95.45	41	38/41 (93%)	0.91	1	1	0.73	0.8
138	44	95.45	41	40/41 (98%)	0.97	1	1	0.88	0.92	138	44	95.45	41	41/41 (100%)	1	1	1	1	1
141	44	95.45	41	41/41 (100%)	1	1	1	1	1	141	44	95.45	41	41/41 (100%)	1	1	1	1	1
143	44	100	43	42/43 (98%)	0.97	1	1	0.89	0.93	143	44	97.73	42	42/42 (100%)	1	1	1	1	1
144	44	100	43	42/43 (98%)	0.97	1	1	0.89	0.93	144	44	100	43	43/43 (100%)	1	1	1	1	1
145	44	100	43	43/43 (100%)	1	1	1	1	1	145	44	100	43	43/43 (100%)	1	1	1	1	1
146	44	97.73	42	41/42 (98%)	1	0.86	0.97	1	0.91	146	44	97.73	42	42/42 (100%)	1	1	1	1	1
147	44	100	43	43/43 (100%)	1	1	1	1	1	147	44	100	43	43/43 (100%)	1	1	1	1	1
148	44	97.73	42	42/42 (100%)	1	1	1	1	1	148	44	97.73	42	42/42 (100%)	1	1	1	1	1
149	44	93.18	40	40/40 (100%)	1	1	1	1	1	149	44	93.18	40	40/40 (100%)	1	1	1	1	1
150	44	95.45	41	40/41 (98%)	1	0.88	0.97	1	0.92	150	44	93.18	40	40/40 (100%)	1	1	1	1	1
151	44	95.45	41	41/41 (100%)	1	1	1	1	1	151	44	95.45	41	41/41 (100%)	1	1	1	1	1
152	44	90.91	39	39/39 (100%)	1	1	1	1	1	152	44	90.91	39	39/39 (100%)	1	1	1	1	1
153	44	95.45	41	41/41 (100%)	1	1	1	1	1	153	44	95.45	41	41/41 (100%)	1	1	1	1	1
155	44	100	43	43/43 (100%)	1	1	1	1	1	155	44	100	43	43/43 (100%)	1	1	1	1	1
156	44	97.73	42	42/42 (100%)	1	1	1	1	1	156	44	97.73	42	42/42 (100%)	1	1	1	1	1
157	44	100	43	41/43 (95%)	0.94	1	1	0.8	0.86	157	44	97.73	42	42/42 (100%)	1	0.86	1	1	1
159	44	97.73	42	42/42 (100%)	1	1	1	1	1	159	44	97.73	42	42/42 (100%)	1	1	1	1	1
160	44	88.64	38	38/38 (100%)	1	1	1	1	1	160	44	88.64	38	38/38 (100%)	1	1	1	1	1
161	44	93.18	40	40/40 (100%)	1	1	1	1	1	161	44	93.18	40	40/40 (100%)	1	1	1	1	1
162	44	97.73	42	42/42 (100%)	1	1	1	1	1	162	44	97.73	42	42/42 (100%)	1	1	1	1	1
164	44	93.18	40	40/40 (100%)	1	1	1	1	1	164	44	93.18	40	40/40 (100%)	1	1	1	1	1
165	44	95.45	41	40/41 (98%)	0.97	1	1	0.88	0.92	165	44	95.45	41	41/41 (100%)	1	1	1	1	1
167	44	95.45	41	39/41 (95%)	0.94	1	1	0.78	0.85	167	44	95.45	41	41/41 (100%)	1	1	1	1	1
168	44	100	43	39/43 (91%)	0.89	1	1	0.67	0.74	168	44	100	43	39/43 (91%)	0.89	1	1	0.67	0.74
170	44	93.18	40	38/40 (95%)	0.97	0.83	0.97	0.83	0.8	170	44	88.64	38	38/38 (100%)	1	1	1	1	1
173	44	97.73	42	41/42 (98%)	1	0.88	0.97	1	0.92	173	44	97.73	42	41/42 (98%)	1	0.88	0.97	1	0.92
175	44	97.73	42	40/42 (95%)	1	0.75	0.94	1	0.83	175	44	97.73	42	42/42 (100%)	1	1	1	1	1
177	44	93.18	40	38/40 (95%)	0.97	0.86	0.97	0.86	0.83	177	44	93.18	40	40/40 (100%)	1	1	1	1	1
178	44	95.45	41	38/41 (93%)	0.94	0.88	0.97	0.78	0.78	178	44	93.18	40	40/40 (100%)	1	1	1	1	1
180	44	100	43	41/43 (95%)	0.94	1	1	0.8	0.86	180	44	97.73	42	42/42 (100%)	1	1	1	1	1
183	44	100	43	41/43 (95%)	0.97	0.88	0.97	0.88	0.85	183	44	95.45	41	41/41 (100%)	1	1	1	1	1
184	44	100	43	39/43 (91%)	0.91	0.88	0.97	0.7	0.72	184	44	95.45	41	41/41 (100%)	1	1	1	1	1
186	44	97.73	42	42/42 (100%)	1	1	1	1	1	186	44	97.73	42	42/42 (100%)	1	1	1	1	1
187	44	95.45	41	40/41 (98%)	0.97	1	1	0.88	0.92	187	44	95.45	41	40/41 (98%)	0.97	1	1	0.88	0.92
188	44	97.73	42	39/42 (93%)	0.94	0.88	0.97	0.78	0.78	188	44	97.73	42	40/42 (95%)	0.97	0.88	0.97	0.88	0.85
189	44	100	43	41/43 (95%)	1	0.75	0.95	1	0.83	189	44	97.73	42	42/42 (100%)	1	0.83	1	1	1
190	44	86.36	37	37/37 (100%)	1	1	1	1	1	190	44	86.36	37	37/37 (100%)	1	1	1	1	1
191	44	93.18	40	40/40 (100%)	1	1	1	1	1	191	44	93.18	40	40/40 (100%)	1	1	1	1	1
192	44	79.55	34	33/34 (97%)	0.96	1	1	0.88	0.91	192	44	79.55	34	34/34 (100%)	1	1	1	1	1
194	44	93.18	40	40/40 (100%)	1	1	1	1	1	194	44	93.18	40	40/40 (100%)	1	1	1	1	1
198	44	97.73	42	40/42 (95%)	0.94	1	1	0.78	0.85	198	44	97.73	42	40/42 (95%)	0.94	1	1	0.78	0.85
199	44	100	43	41/43 (95%)	0.94	1	1	0.8	0.86	199	44	100	43	43/43 (100%)	1	1	1	1	1
202	44	88.64	38	36/38 (95%)	0.94	1	1	0.71	0.8	202	44	88.64	38	36/38 (95%)	0.94	1	1	0.71	0.8
207	44	90.91	39	36/39 (92%)	0.94	0.83	0.97	0.71	0.72	207	44	90.91	39	36/39 (92%)	0.94	0.83	0.97	0.71	0.72
208	44	88.64	38	36/38 (95%)	0.94	1													

Table S2. PR descriptive statistics generated from self-assessment and cIQc assessment.

Lab ID	Self-assessment									cIQc Assessment									
	Total n	% Scorable	Pairwise Complete Observations	Concordance with Reference (%)	Sensitivity	Specificity	PPV (positive predictive value)	NPV (negative predictive value)	Cohen's kappa	Lab ID	Total n	% Scorable	Pairwise Complete Observations	Concordance with Reference (%)	Sensitivity	Specificity	PPV (positive predictive value)	NPV (negative predictive value)	Cohen's kappa
101	44	84.09	36	35/36 (97%)	0.96	1	1	0.89	0.92	101	44	84.09	36	36/36 (100%)	1	1	1	1	1
102	44	79.55	34	33/34 (97%)	0.96	1	1	0.89	0.92	102	44	77.27	33	33/33 (100%)	1	1	1	1	1
103	44	93.18	40	36/40 (90%)	0.93	0.83	0.93	0.83	0.76	103	44	86.36	37	37/37 (100%)	1	1	1	1	1
105	44	75	32	31/32 (97%)	1	0.88	0.96	1	0.91	105	44	72.73	31	31/31 (100%)	1	1	1	1	1
106	44	86.36	37	36/37 (97%)	0.96	1	1	0.92	0.94	106	44	86.36	37	36/37 (97%)	0.96	1	1	0.92	0.94
107	44	86.36	37	35/37 (95%)	1	0.82	0.93	1	0.86	107	44	86.36	37	35/37 (95%)	1	0.82	0.93	1	0.86
109	44	90.91	39	33/39 (85%)	0.93	0.64	0.87	0.78	0.6	109	44	81.82	35	35/35 (100%)	1	1	1	1	1
111	44	79.55	34	33/34 (97%)	0.96	1	1	0.9	0.93	111	44	79.55	34	34/34 (100%)	1	1	1	1	1
112	44	79.55	34	33/34 (97%)	0.96	1	1	0.9	0.93	112	44	77.27	33	33/33 (100%)	1	1	1	1	1
113	44	88.64	38	35/38 (92%)	0.93	0.9	0.96	0.82	0.8	113	44	84.09	36	36/36 (100%)	1	1	1	1	1
114	44	100	43	42/43 (98%)	0.97	1	1	0.93	0.95	114	44	100	43	43/43 (100%)	1	1	1	1	1
115	44	77.27	33	33/33 (100%)	1	1	1	1	1	115	44	77.27	33	33/33 (100%)	1	1	1	1	1
116	44	93.18	40	37/40 (93%)	0.93	0.92	0.96	0.85	0.83	116	44	93.18	40	37/40 (93%)	0.93	0.92	0.96	0.85	0.83
117	44	86.36	37	35/37 (95%)	0.96	0.9	0.96	0.9	0.86	117	44	81.82	35	35/35 (100%)	1	1	1	1	1
119	44	79.55	34	34/34 (100%)	1	1	1	1	1	119	44	79.55	34	34/34 (100%)	1	1	1	1	1
120	44	86.36	37	35/37 (95%)	0.96	0.91	0.96	0.91	0.87	120	44	86.36	37	35/37 (95%)	0.96	0.91	0.96	0.91	0.87
122	44	77.27	33	33/33 (100%)	1	1	1	1	1	122	44	77.27	33	33/33 (100%)	1	1	1	1	1
123	44	84.09	36	34/36 (94%)	0.93	1	1	0.82	0.86	123	44	81.82	35	34/35 (97%)	0.96	1	1	0.9	0.93
124	44	93.18	40	36/40 (90%)	0.93	0.83	0.93	0.83	0.76	124	44	93.18	40	36/40 (90%)	0.93	0.83	0.93	0.83	0.76
125	44	81.82	35	34/35 (97%)	0.96	1	1	0.9	0.93	125	44	79.55	34	34/34 (100%)	1	1	1	1	1
126	44	86.36	37	34/37 (92%)	0.89	1	1	0.77	0.81	126	44	86.36	37	34/37 (92%)	0.89	1	1	0.77	0.81
127	44	97.73	42	41/42 (98%)	0.97	1	1	0.92	0.94	127	44	97.73	42	42/42 (100%)	1	1	1	1	1
128	44	97.73	43	42/43 (98%)	0.97	1	1	0.93	0.95	128	44	97.73	43	42/43 (98%)	0.97	1	1	0.93	0.95
129	44	100	43	40/43 (93%)	0.97	0.85	0.94	0.92	0.83	129	44	100	43	41/43 (95%)	1	0.85	0.94	1	0.88
132	44	77.27	33	33/33 (100%)	1	1	1	1	1	132	44	77.27	33	33/33 (100%)	1	1	1	1	1
133	44	77.27	33	32/33 (97%)	1	0.88	0.96	1	0.91	133	44	75	32	32/32 (100%)	1	1	1	1	1
134	44	95.45	41	40/41 (98%)	0.97	1	1	0.92	0.94	134	44	95.45	41	41/41 (100%)	1	1	1	1	1
135	44	97.73	42	41/42 (98%)	1	0.92	0.97	1	0.94	135	44	97.73	42	41/42 (98%)	1	0.92	0.97	1	0.94
136	44	95.45	41	41/41 (100%)	1	1	1	1	1	136	44	95.45	41	41/41 (100%)	1	1	1	1	1
138	44	95.45	41	39/41 (95%)	0.93	1	1	0.86	0.89	138	44	95.45	41	40/41 (98%)	0.97	1	1	0.92	0.94
141	44	97.73	42	42/42 (100%)	1	1	1	1	1	141	44	97.73	42	42/42 (100%)	1	1	1	1	1
143	44	100	43	42/43 (98%)	0.97	1	1	0.93	0.95	143	44	97.73	42	42/42 (100%)	1	1	1	1	1
145	44	95.45	41	41/41 (100%)	1	1	1	1	1	145	44	95.45	41	41/41 (100%)	1	1	1	1	1
146	44	97.73	42	40/42 (95%)	1	0.83	0.94	1	0.88	146	44	97.73	42	41/42 (98%)	1	0.92	0.97	1	0.94
147	44	100	43	42/43 (98%)	0.97	1	1	0.93	0.95	147	44	97.73	42	42/42 (100%)	1	1	1	1	1
149	44	100	43	43/43 (100%)	1	1	1	1	1	149	44	100	43	43/43 (100%)	1	1	1	1	1
150	44	97.73	42	42/42 (100%)	1	1	1	1	1	150	44	97.73	42	42/42 (100%)	1	1	1	1	1
151	44	93.18	41	39/41 (95%)	0.93	1	1	0.86	0.89	151	44	93.18	41	41/41 (100%)	1	1	1	1	1
152	44	95.45	42	42/42 (100%)	1	1	1	1	1	152	44	95.45	42	42/42 (100%)	1	1	1	1	1
153	44	95.45	42	40/42 (95%)	0.93	1	1	0.87	0.89	153	44	95.45	42	42/42 (100%)	1	1	1	1	1
155	44	100	43	43/43 (100%)	1	1	1	1	1	155	44	100	43	43/43 (100%)	1	1	1	1	1
156	44	100	43	43/43 (100%)	1	1	1	1	1	156	44	100	43	43/43 (100%)	1	1	1	1	1
157	44	95.45	42	42/42 (100%)	1	1	1	1	1	157	44	95.45	42	42/42 (100%)	1	1	1	1	1
159	44	97.73	43	43/43 (100%)	1	1	1	1	1	159	44	97.73	43	43/43 (100%)	1	1	1	1	1
160	44	97.73	43	43/43 (100%)	1	1	1	1	1	160	44	97.73	43	43/43 (100%)	1	1	1	1	1
161	44	95.45	42	42/42 (100%)	1	1	1	1	1	161	44	95.45	42	42/42 (100%)	1	1	1	1	1
162	44	93.18	40	39/40 (98%)	0.96	1	1	0.92	0.94	162	44	90.91	39	39/39 (100%)	1	1	1	1	1
164	44	95.45	42	42/42 (100%)	1	1	1	1	1	164	44	95.45	42	42/42 (100%)	1	1	1	1	1
165	44	97.73	42	42/42 (100%)	1	1	1	1	1	165	44	97.73	42	42/42 (100%)	1	1	1	1	1
167	44	100	43	41/43 (95%)	0.93	1	1	0.87	0.89	167	44	100	43	43/43 (100%)	1	1	1	1	1
168	44	95.45	42	42/42 (100%)	1	1	1	1	1	168	44	95.45	42	42/42 (100%)	1	1	1	1	1
170	44	97.73	43	43/43 (100%)	1	1	1	1	1	170	44	97.73	43	43/43 (100%)	1	1	1	1	1
173	44	100	43	41/43 (95%)	0.97	0.92	0.97	0.92	0.89	173	44	100	43	41/43 (95%)	0.97	0.92	0.97	0.92	0.89
175	44	97.73	42	42/42 (100%)	1	1	1	1	1	175	44	97.73	42	42/42 (100%)	1	1	1	1	1
177	44	95.45	42	41/42 (98%)	0.97	1	1	0.93	0.95	177	44	93.18	41	41/41 (100%)	1	1	1	1	1
178	44	84.09	36	35/36 (97%)	0.96	1	1	0.92	0.94	178	44	81.82	35	35/35 (100%)	1	1	1	1	1
183	44	97.73	42	42/42 (100%)	1	1	1	1	1	183	44	97.73	42	42/42 (100%)	1	1	1	1	1
184	44	97.73	43	41/43 (95%)	0.97	0.92	0.97	0.92	0.89	184	44	97.73	43	41/43 (95%)	0.97	0.92	0.97	0.92	0.89
186	44	100	43	43/43 (100%)	1	1	1	1	1	186	44	100	43	43/43 (100%)	1	1	1	1	1
187	44	100	43	43/43 (100%)	1	1	1	1	1	187	44	100	43	43/43 (100%)	1	1	1	1	1
188	44	95.45	42	42/42 (100%)	1	1	1	1	1	188	44	95.45	42	42/42 (100%)	1	1	1	1	1
189	44	97.73	43	43/43 (100%)	1	1	1	1	1	189	44	97.73	43	43/43 (100%)	1	1	1	1	1
190	44	95.45	41	40/41 (98%)	0.96	1	1	0.93	0.94	190	44	95.45	41	41/41 (100%)	1	1	1	1	1
191	44	81.82	35	35/35 (100%)	1	1	1	1	1	191	44	81.82	35	35/35 (100%)	1	1	1	1	1
192	44	93.18	40	39/40 (98%)	0.97	1	1	0.92	0.94	192	44	93.18	40	40/40 (100%)	1	1	1	1	1
194	44	97.73	42	41/42 (98%)	0.97	1	1	0.92	0.94	194	44	97.73	42	42/42 (100%)	1	1	1	1	1
198	44	97.73	43	42/43 (98%)	0.97	1	1	0.93	0.95	198	44	97.73	43	42/43 (98%)	0.97	1	1	0.93	0.95
199	44	100	43	43/43 (100%)	1	1	1	1	1	199	44	100	43	43/43 (100%)	1	1	1	1	1
202	44	93.18	40	39/40 (98%)	0.97	1	1	0.92	0.94	202	44	93.18	40	39/40 (98%)	0.97	1	1	0.92	0.94
207	44	90.91	39	35/39 (90%)	0.9	0.9	0.96	0.75	0.75	207	44	90.91	39	35/39 (90%)	0.9	0.9	0.96	0.75	0.75
207 (16)	44	95.45	42	39/42 (93%)	0.9	1	1	0.81	0.84	207 (16)	44	95.45	42	41/42 (98%)	0.97	1	1	0.93	0.95
208	44	86.36	37	35/37 (95%)	0.97	0.88	0.97	0.88	0.84	208	44	86.36	37	35/37 (95%)	0.97	0.88	0.97	0.88	0.84
209	44	93.18	40	40/40 (100%)															

Table S3. HER2 descriptive statistics generated from self-assessment (unchanged after cIQc assessment).

Lab ID	Total n	% Scorable	Pairwise Complete Observations	Concordance with Reference (%)	Sensitivity	Specificity	PPV (positive predictive value)	NPV (negative predictive value)	Cohen's kappa
101	42	88.1	35	35/35 (100%)	1	1	1	1	1
102	42	92.86	37	37/37 (100%)	1	1	1	1	1
103	42	100	39	39/39 (100%)	1	1	1	1	1
105	42	95.24	38	38/38 (100%)	1	1	1	1	1
106	42	97.62	38	38/38 (100%)	1	1	1	1	1
107	42	100	39	39/39 (100%)	1	1	1	1	1
109	42	100	39	39/39 (100%)	1	1	1	1	1
111	42	97.62	38	38/38 (100%)	1	1	1	1	1
112	42	85.71	34	34/34 (100%)	1	1	1	1	1
113	42	100	39	39/39 (100%)	1	1	1	1	1
114	42	100	39	39/39 (100%)	1	1	1	1	1
115	42	90.48	37	37/37 (100%)	1	1	1	1	1
116	42	100	39	39/39 (100%)	1	1	1	1	1
117	42	100	39	39/39 (100%)	1	1	1	1	1
119	42	92.86	37	37/37 (100%)	1	1	1	1	1
120	42	100	39	39/39 (100%)	1	1	1	1	1
123	42	95.24	37	37/37 (100%)	1	1	1	1	1
124	42	95.24	38	38/38 (100%)	1	1	1	1	1
125	42	97.62	39	39/39 (100%)	1	1	1	1	1
126	42	97.62	38	37/38 (97%)	0.75	1	1	0.97	0.84
127	42	97.62	38	38/38 (100%)	1	1	1	1	1
129	42	95.24	37	37/37 (100%)	1	1	1	1	1
133	42	90.48	36	36/36 (100%)	1	1	1	1	1
135	42	97.62	38	38/38 (100%)	1	1	1	1	1
136	42	90.48	36	35/36 (97%)	0.75	1	1	0.97	0.84
138	42	92.86	38	38/38 (100%)	1	1	1	1	1
145	42	90.48	37	37/37 (100%)	1	1	1	1	1
147	42	100	39	39/39 (100%)	1	1	1	1	1
149	42	100	39	39/39 (100%)	1	1	1	1	1
150	42	92.86	37	37/37 (100%)	1	1	1	1	1
151	42	97.62	38	37/38 (97%)	1	0.97	0.8	1	0.87
152	42	92.86	37	37/37 (100%)	1	1	1	1	1
153	42	100	39	38/39 (97%)	0.75	1	1	0.97	0.84
155	42	97.62	38	38/38 (100%)	1	1	1	1	1
156	42	85.71	33	33/33 (100%)	1	1	1	1	1
157	42	95.24	37	37/37 (100%)	1	1	1	1	1
160	42	95.24	38	38/38 (100%)	1	1	1	1	1
161	42	97.62	39	39/39 (100%)	1	1	1	1	1
162	42	100	39	39/39 (100%)	1	1	1	1	1
164	42	90.48	36	36/36 (100%)	1	1	1	1	1
167	42	97.62	38	38/38 (100%)	1	1	1	1	1
170	42	100	39	39/39 (100%)	1	1	1	1	1
175	42	95.24	37	37/37 (100%)	1	1	1	1	1
181	42	97.62	38	38/38 (100%)	1	1	1	1	1
186	42	95.24	37	37/37 (100%)	1	1	1	1	1
187	42	97.62	38	38/38 (100%)	1	1	1	1	1
188	42	97.62	39	39/39 (100%)	1	1	1	1	1
189	42	100	39	39/39 (100%)	1	1	1	1	1
190	42	90.48	37	37/37 (100%)	1	1	1	1	1
191	42	90.48	37	37/37 (100%)	1	1	1	1	1
194	42	95.24	38	38/38 (100%)	1	1	1	1	1
198	42	100	39	39/39 (100%)	1	1	1	1	1
199	42	97.62	38	38/38 (100%)	1	1	1	1	1
202	42	92.86	37	37/37 (100%)	1	1	1	1	1
207	42	100	39	39/39 (100%)	1	1	1	1	1

Table S4. ER staining protocols.

Lab	Clone	Dilution	Supplier	Antigen Retrieval	Detection System	Enhancement	Chromagen
101	SP1	1:50	Thermo Scientific	CC1 ventana	Ventana optiview	Copper	DAB
102	SP1	1/30	LABVISION	DAKO 3 IN 1 HIGH PH	DAKO FLEX	CUS04	DAB+
103	SP1	Pre-diluted	Ventana/Roche	CC1 64 MINS	ULTRA VIEW	COPPER	DAB
105	SP1	1:50	Thermoscientific	CC1 Standard	Ultramap Anti Rb HRP	None	DAB
106	6F11	1:75	Leica	TRIS/HCl pH9.0, microwave/pressure	HAM/Elite	none	DAB
107	SP1	Pre-diluted	Ventana	Ventana cc1 36 minutes	Ventana UltraView	No	DAB
109	6F11	1/40	VECTOR	CC1 STD (HIER)	ULTRAVIEW	COPPER	DAB
111	SP1	Pre-diluted	VENTANA	CC1-36 MINUTE	ULTRAVIEW	NO	DAB
112	SP1	Ready-to-Use	VENTANA	CC1	ultraVIEW	COPPER	DAB
113	SP1	Pre-diluted	Ventana	CC1	Ultraview	copper	DAB
114	SP1	1/50	Thermo Fisher	CC1-32min	Optiview-Ventana	oView Copper	DAB
115	SP1	Pre-diluted	VENTANA	CC1	iVIEW DAB	COOPER	DAB
116	SP1	Ready-to-Use	VENTANA	CC1 64MIN	UltraView DAB Ventana	no	DAB
117	Sp1	Pre-diluted	Ventana	CC1	Ultraview	Cuso4	Dab
119	SP1	Pre-diluted	Ventana	HIER/CC1	Ultraview Ventana	-	DAB
120	EP1	Ready-to-Use	Dako	high PH	Dako Autostainer Link 48	.	DAB
122	6F11	Ready-to-Use	Nova Castra	ER2 high pH 20 min	Polymer	N/A	DAB
123	SP1	Pre-diluted	Roche/Ventana	CC1 mild	Ultraview	Copper	DAB
124	SP1	1/100	Cell Marque	CC1	Streptavidin	none	DAB
125	SP1	Pre-diluted	Roche	ER2-20	Bond Polymer Refine	Bond Enhancer	DAB
126	SP1	1:200	Lab Vision	Citrate pH6.0 MWPC	Polymer	None	DAB
127	SP1	Pre-diluted	Ventana	36 mins.	Ventana ultraview Det.	n/a	DAB
128	SP1	Pre-diluted	ROCHE	TES	ULTRAVIEW	YES	DAB
129	Sp1	1:50	Thermo Fisher	ER2 High pH Retrieval Buffer	Bond Refine Detection Kit	NO	DAB
132	6F11	1:80	DAKO	PT Link High pH	Flex	N/A	DAB
133	SP1	Pre-diluted	Roche	CC1 High ph	polymer - Ultraview	none	Dab
134	SP1	Ready-to-Use	Ventana/Roche	30 minutes	Ultraview	None	DAB
135	SP1	1:50	Thermol Fisher	PH 9 buffer 20 min	Bond refined polymer	N/A	DAB
136	6F11	1/40	Vector	HIER pH 6.0	LSAB	none	DAB
138	EP1	Ready-to-Use	Dako	High pH HIER (9.0)	Polymer (Dako)	None	DAB
141	SP1	Pre-diluted	Ventana / Roche	HIER online -30m high pH	ultraView	none	DAB
143	SP1	no	Confirm Ventana	CC1 60 min	I view DAB detection kit	no	DAB
144	SP1	Pre-diluted	Ventana	CC1, 8 min.	Optiview	Copper	DAB
145	SP1	1/100	CELL MARQUE	CC1	VENTANA OPTIVIEW	NO	DAB
146	EP1	Ready-to-Use	Dako	Flex TRS HIGH	EnVision Flex Peroxydase	None	Substrat Working Solution DAB
147	SP1	1:50	FISHER	ER2, pH 9 (edta)	Leica Refine	No	DAB
148	SP1	Ready-to-Use	Ventana	CC1 36 MIN	Ultraview	no	DAB
149	IR084	Ready-to-Use	Dako	PT Link High pH 98 C 20 min	EnVision Flex	No	DAB
150	sp1	Ready-to-Use	ventana	cc1	ultra view	copper	DAB
151	SP1	1:50	thermo scientific	HIER 2 (pH 9.0) 20 min	Bond	N/A	DAB
152	SP1	Pre-diluted	Roche-Ventana	CC1 (standard)	iVIEW	Copper sulfate	DAB
153	sp1	Pre-diluted	Ventana	cc1	Ultraview Dab	Ultraview copper	Dab
155	SP1	Pre-diluted	Ventana	CC1	Ultraview dab	Ultraview copper	dab
157	SP-1	Pre-diluted	VENTANA	YES	BENCHMARK XT OPTIVIEW	YES	YES
159	EP1	Pre-diluted	DAKO	High pH	Flex	None	DAB
160	SP1	no	Ventana	EDTA pH8	Ventana Ultraview	None	DAB
161	EP1	Ready-to-Use	DAKO	High EDTA Buffer Tris	Envision Flex	no	DAB
162	SP1	1:100	Thermo Scientific RM-9101s	CC1 - Roche 48 min	OptiView - Roche	-	DAB - Roche
164	SP1	Pre-diluted	Ventana	CC1/ 36 min	Benchmark ultra	no	Ultraview DAB
165	sp1	nil	ventana	cc1	ultraview	ultraview	dab
167	SP1	Ready to use	Ventana	Yes	XT Ultraview DAB	Yes	DAB
168	SP1	1/200	Cellmarque	High pH	Envision Flex	Rabbit linker	DAB
170	Ep1	Ready-to-Use	dako	HIER pH high	flex 20	no	DAB
173	SP1	Pre-diluted	Ventana	CC1-EDTA	Ultraview- Polymer	Polymer	DAB
175	SP1	Pre-diluted	Ventana	CC1	Ultraview	Copper	DAB
177	6F11	1 : 25	Novocastra	Yes	Ventana Ultraview	Yes	DAB
178	SP1	Pre-diluted	Ventana	CC1 Mild	Ultraview	None	DAB
180	SP1	Ready-to-Use	Ventana	CC1 mild (30 min)	iView DAB	none	DAB
183	SP1	Pre-diluted	VENTANA	ULTRA CC1	ULTRAVIEW	NONE	DAB
184	RxH EP1	Ready-to-Use	Dako	Hi pH HIER	Envision Flex	n/a	DAB+
186	SP1	1:50	Thermoscientific	HIER in EDTA buffer for 20'	Bond refine detection kit	None	DAB
187	SP1	Pre-diluted	Ventana	CC1	Optiview	None	DAB
188	6F11	1/50	Leica Biosystems	ER1 (20)	Bond Polymer Refine Detection System	None	DAB
189	SP1	Ready-to-Use	Ventana	CC1 Std	Ultraview	Copper	DAB
191	SP1	Ready-to-Use	Roche	CC1	Ultraview	none	DAB
192	SP1	Ready to use	Ventana	CC1 mild (30 min.)	Ventana Ultraview DAB detection kit	Copper	DAB
194	SP1	Pre-diluted	Ventana	CC1	AVIDIN/BIOTIN	COPPER	DAB
198	6F11	1/100	Leica Microsystems	DIVA (pH 6.2)	MACH 1 polymer	Copper Sulphate	DAB
199	6F11	Pre-diluted	Leica Microsystems	HIER (ER-1 Bond)	Bond Refine	None	DAB
202	6F11	1/300	VECTOR	LEICA H2 SOLUTION	LECIA REFINE DETECTION KIT	NONE	DAB
207	SP1	Pre-diluted	Ventana	CC1-36	Ultraview DAB	None	Peroxidase-DAB
208	6F11	1:50	Leica	PH6	dako	none	DAB
209	EP1	N/A	DAKO	YES (HIER)	ENVISION FLEX /HRP (DAKO)	N/A	DAB

Table S5. PR staining protocols.

Lab	Clone	Dilution	Supplier	Antigen Retrieval	Detection System	Enhancement	Chromagen
101	16	1:100	Leica	CC1 Ventana	Ventana Optiview	Copper	DAB
102	16	1/150	NOVOCASTRA	DAKO 3 IN 1 HIGH PH	DAKO FLEX	CUSO4	DAB+
103	Sp1	Pre-diluted	Ventana Roche	CC1 64 mins	ultra view	copper	dab
105	PgR636	1:50	Dako	CC1 Standard	Ultramap anti Rb HRP	None	DAB
106	PgR 1294	1:1800	Dako	Tris/HCl pH 9.0 microwave/pressure	HAM/Elite	none	DAB
107	PgR 1294	1:50	Dako	Ventana cc1 64 minutes	Ventana UltraView	Ventana Amp Kit	DAB
109	16	1 / 100	VECTOR	CC1 STD (HIER)	ULTRAVIEW	COPPER	DAB
111	16	Pre-diluted	LEICA	CC1-36 MINUTE	ULTRAVIEW	NO	DAB
112	100	Ready-to-Use	VENTANA	CC1	ultraVIEW	COPPER	DAB
113	PgR 636	1/300	Dako	Low pH	Flex	+Mouse	DAB
114	16	1/25	Novocastra	CC1-32min	Optiview Ventana	oView Copper	DAB
115	100	Pre-diluted	VENATANA	CC1	IVIEW DAB	COOPER	DAB
116	clone 16	1/100	LEICA	CC1 64 MIN	Ultraview DAB Ventana	yes	DAB
117	100	Pre-diluted	Ventana	CC1	Ultraview	Cuso4	Dab
119	16	Pre-diluted	Ventana	HIER/CC1	Ultraview Ventana	-	DAB
120	PgR 636	Ready-to-Use	Dako	High PH	Dako Autostainer Link 48	.	DAB
122	16	Ready-to-Use	Nova Castra	ER2 - 20 min	Polymer refine (Leica)	N/A	DAB
123	16	1/50	Vector Laboratories	CC1 standard	Ultraview	Copper	DAB
124	IE2	none	Ventana	CC1	Streptavidin	none	DAB
125	100	1/4 of predilute	Roche	ER2-20	Bond Polymer Refine	Bond Enhancer	DAB
126	PgR 636	1:500	Dako	Citrate pH6.0 MWPC	Polymer	None	DAB
127	100	Pre-diluted	Ventana	36 mins.	Ventana ultraview Det.	n/a	DAB
128	IE2	Pre-diluted	ROCHE	YES	ULTRAVIEW	YES	DAB
129	16	1:400	Nova Castra	Bond ER2 High pH Retrieval Buffer	Bond Refine Detection Kit	No	DAB
132	PR16	1:200	DAKO	PTLink High pH	Flex	N/A	DAB
133	16	1/50	Vector	CC1 high ph	polymer- Ultraview	none	Dab
134	100	Ready-to-Use	Ventana/Roche	30 minutes	Ultraview	None	DAB
135	16	1:400	Leica	PH9 buffer 20 min	BOND refined polymer	N/A	DAB
136	16	1/200	Vector	HIER pH 6	LSAB	none	DAB
138	PgR 636	Ready-to-Use	Dako	High pH HIER (9.0)	Polymer (Dako)	None	DAB
141	100	Pre-diluted	Ventana / Roche	HIER online 30m high pH	ultraView	none	DAB
143	100	no	Confirm Ventana	CC1 60 min	Mew DAB detection kit	endogenous biotin kit	DAB
145	100	1/10 FROM PRE-DILUTED	VENTANA	CC1	VENTANA OPTIVIEW	NO	DAB
146	PgR 636	Ready-to-Use	Dako	FLEX TRS HIGH	EnVision Flex Peroxydase	None	Substrat Working Solution
147	16	1:800	NCL	ER2, pH 9 (edta)	Leica Refine	No	DAB
149	IR068	Ready-to-Use	Dako	PT Link high pH 98 C 20 min	EnVision Flex Plus	Yes	DAB
150	100	Pre-diluted	ventana	cc1	ultra view	copper	DAB
151	1A6	1:200	NCL	HIER 1 (pH6.0) 20 min	Bond Vision	N/A	DAB
152	100	Pre-diluted	Roche-Ventana	CC1 (standard)	ivIEW	Copper sulfate	DAB
153	100	Pre-diluted	Ventana	CC1	Ultraview Dab	Ultra view copper	Dab
155	100	Pre-diluted	Ventana	CC1	Ultraview dab	ultraview copper	dab
157	IE 2	Pre-diluted	VENTANA	YES	BENCHMARK XT OPTIVIEW	YES	YES
159	PgR636	Pre-diluted	DAKO	High pH	Flex Envision	None	DAB
160	100	No	Ventana	EDTA pH8	Ventana Ultraview	None	DAB
161	PgR636	Ready-to-Use	DAKO	High EDTA Buffer Tris	Envision Flex	mouse linker	DAB
162	16	1:80	Leica - NCL-L-PR-312	CC1 - Roche - 48 min	OptiView - Roche		DAB
164	100	Pre-diluted	Ventana	CC1/ 36 min	Benchmark ultra	no	Ultraview DAB
165	100	nil	ventana	cc1	ultraview	ultraview	dab
167	100	Ready-to-Use	Ventana	Yes	XT Ultraview DAB	Yes	DAB
168	PgR 636	Ready-to-Use	Dako	High pH	Envision Flex	Mouse Linker	DAB
170	PgR636	Ready-to-Use	dako	HIER pH high	flex 20	no	DAB
173	100	Pre-diluted	Ventana	CC1-EDTA	Ultraview-Polymer	Polymer	DAB
175	E2	Pre-diluted	Ventana	CC1	Ultraview	Copper	DAB
177	pgR636	1 : 25	DAKO	YES	VENTANA ULTRAVIEW	YES	DAB
178	100	Pre-diluted	Ventana	CC1 Mild	Ultraview	None	DAB
183	100	Pre-diluted	VENTANA	ULTA CC1	ULTRAVIEW	NONE	DAB
184	MxH 636	Ready-to-Use	Dako	High pH HIER	Envision FLEX	Mouse Linker	DAB+
186	PR88	1:100	Biogenex	HIER EDTA buffer 20'	Bond refine detection kit	None	DAB
187	100	Pre-diluted	Ventana	CC1	Optiview	None	DAB
188	16	Pre-diluted	Leica Biosystems	ER2(20)	Bond Polymer Refine Detection System	None	DAB
189	100	Ready-to-Use	Ventana	CC1 Std	Ultraview	Copper	DAB
191	100	Ready-to-Use	Roche	CC1	Ultraview	none	DAB
192	100	Ready to use	Ventana	CC1 mild (30 min.)	Ventana Ultraview DAB detection kit	Copper	DAB
194	IE2	Pre-diluted	VENTANA	CC1	AVIDIN/BIOTIN	COPPER	DAB
198	16	1/400	Vector Laboratories	DIVA (pH 6.2)	MACH 1 polymer	Copper Sulphate	DAB
199	16	1:200	Leica Microsystems	HIER (ER-1 Bond)	Bond Refine	None	DAB
202	16	Ready-to-Use	LEICA	LEICA H2 SOLUTION	LEICA REFINE DETECTION KIT	NONE	DAB
207	100	Pre-diluted	Ventana	CC1-36	Ultraview DAB	None	Preoxidase- DAB
207 (16)	16		Vector	CC1-64	Ultraview DAB	None	Preoxidase- DAB
208	PgR636	1:50	Dako	Ph6	Dako	none	DAB
209	PgR636	N/A	DAKO	YES (HIER)	ENVISION FLEX/HRP (DAKO)	N/A	DAB

Table S6. HER2 staining protocols.

Lab	Clone	Dilution	Supplier	Antigen Retrieval	Detection System	Enhancement	Chromagen
101	SP3	1:200	Thermo Scientific	CC1 Ventana	Ventana Optiview	Copper	DAB
102	SP3	1/480	LABVISION	DAKO 3 IN 1 HIGH PH	DAKO FLEX	CUSO4	DAB+
103	4b5	Pre-diluted	Ventana/ Roche	CC1 36 mins	ULTRA VIEW	COPPER	DAB
105	4B5	Neat	Ventana	CC1 Standard	DABMAP	none	DAB
106	4B5	Pre-diluted	Ventana	CC1_online retrieval	Ultraview universal	none	DAB
107	4B5	Pre-diluted	Ventana	Ventana cc1 36 minutes	Ventana UltraView	No	DAB
109	4B5	Ready-to-Use	VENTANA	CCI MILD (HIER)	ULTRAVIEW UNIVERSAL	COPPER	DAB
111	4B5	Pre-diluted	VENTANA (790-4493)	CC1-36 MINUTES	ULTRAVIEW	NO	DAB
112	4B5	Ready-to-Use	VENTANA	CC1	ultraVIEW	COPPER	DAB
113	Polyclonal	1/175	Dako	CC1	Ultraview	copper	DAB
114	SP3	1/200	Thermo Fisher	CC1-32min	Optiview Ventana	oView Copper	DAB
115	4B5	Pre-diluted	VENTANA	CC1	IVEW DAB	COOPER	DAB
116	SP3	1/100	Thermoscientific	CC1 40min	Optiview DAB Ventana	no	DAB
117	Sp3	Sp3 1/200	Thermo	CC1	Ultraview	CUSO4	Dab
119	Dako A0485	1/1000	Dako	HIER/CC1	Ultraview Ventana	-	DAB
120	Hercep Test	Ready-to-Use	Dako	Epitope Retrieval Sol'n	Dako Autostainer Link 48	.	DAB
123	4B5	Pre-diluted	Roche/ Ventana	CC1 mild	Ultraview	Copper	DAB
124	4B5	none	Ventana	CCI	Streptavidin	none	DAB
125	4B5	Pre-diluted	Roche	CC1 mild	ultraView Universal detection	NA	DAB
126	SP3	1:200	Lab Vision	Steam Tris pH10 30'	Polymer	None	DAB
127	4B5	Pre-diluted	Ventana	36 mins.	Ventana ultraview Det.	n/a	DAB
129	Cerb b2 A0485	1:600	Dako	Bond ER1 Low pH Retrieval Buffer	Bond Refine Detection Kit	No	DAB
133	4B5	Pre-diluted	Roche	CC1 high ph	polymer- Ultraview	none	Dab
135	Polyclonal	1:700	Dako	PH6 buffer 20 min	BOND refined polymer	N/A	DAB
136	A0485	1/600	Dako	none	LSAB	none	DAB
138	Polyclonal (A0485)	1:600	Dako	Low pH HIER (6.0)	Polymer (Dako)	None	DAB
145	SP3	1/600	CELL MARQUE	CC1	VENTANA OPTIVIEW	NO	DAB
147	Polyclonal	1:400	Dako	ER1_pH 6 (citrate)	Leica Refine	No	DAB
149	A0485	1:500	Dako	PT Link low pH 98 C 20 min	EnVision Flex Plus	Yes	DAB
150	sp3	1/100	neomarquer	cc1	ultraview	copper	DAB
151	rabbit	1:450	DAKO	HIER 1 (pH6.0) 20 min	Bond	N/A	DAB
152	4B5	Pre-diluted	Roche-Ventana	CCI (standard)	iVIEW	Copper sulfate	DAB
153	SP3	1/100	Neo marker Thermo Fisher	CC1	Ultraview Dab	Ultraview Copper	DAB
155	4B5	Pre-diluted	Ventana	CC1	Ultraview dab	Ultraview copper	dab
157	4B5	Pre-diluted	VENTANA	YES	BENCHMARK XT OPTIVIEW	YES	YES
160	A0485	1/700	Dako	EDTA pH8	Ventana Ultraview	None	DAB
161	Rabbit anti-human Her2 protein	Ready-to-Use	Dako	Herceptest epitope retrieval solution	Herceptest visualization reagent	no	DAB
162	4B5	Ready-to-Use	Roche	CC1 - Roche - 32 min	Ultra View	-	DAB
164	4B5	Pre-diluted	Ventana	CC1/ 36 min	Benchmark ultra	no	ultraview DAB
167	A0485	1/1700	Dako	Yes	XT Ultraview DAB	Yes	DAB
170	ErB-2	Ready-to-Use	dako	HIER pH low	herceptest (flex 30)	no	DAB
175	4B5	Pre-diluted	Ventana	CC1	Ultraview	Copper	DAB
181	4B5	Pre-diluted	Ventana	CC1 for 30 minutes	Ventana Ultraview kit	N/A	DAB
186	Polyclonal	1:200	DAKO	HIER Citrate buffer 20'	Bond refine detection kit	None	DAB
187	4B5	Pre-diluted	Ventana	CC1	Optiview	None	DAB
188	CB11	Pre-diluted	Leica Biosystems	ER1(25)	Bond Oracle HER2 IHC detection system	None	DAB
189	4B5	Ready-to-Use	Ventana	CC1 Std	Ultraview	Copper	DAB
191	4B5	Ready-to-Use	Roche	CC2	ultraview	none	DAB
194	4B5	Pre-diluted	VENTANA	CC1	AVIDIN/BIOTIN	COPPER	DAB
198	4B5	Pre-diluted	Ventana-Roche	CC1	Ultraview	Copper sulphate	DAB
199	CB11	Ready-to-Use	Leica Microsystems	HIER (ER-1 Bond)	Oracle HER2 Kit-Leica	None	DAB
202	HER2	Ready-to-Use	DAKO	HERCEPTEST EPIPOPE RETRIEVAL SOLTUION	HERCEPTEST DETECTION KIT	NONE	DAB
207	4B5	Pre-diluted	Ventana	CC1-36	Ultraview DAB	None	Peroxidase-DAB