

Figure S1: Representative dimension reduced electropherogram of one gel lane.

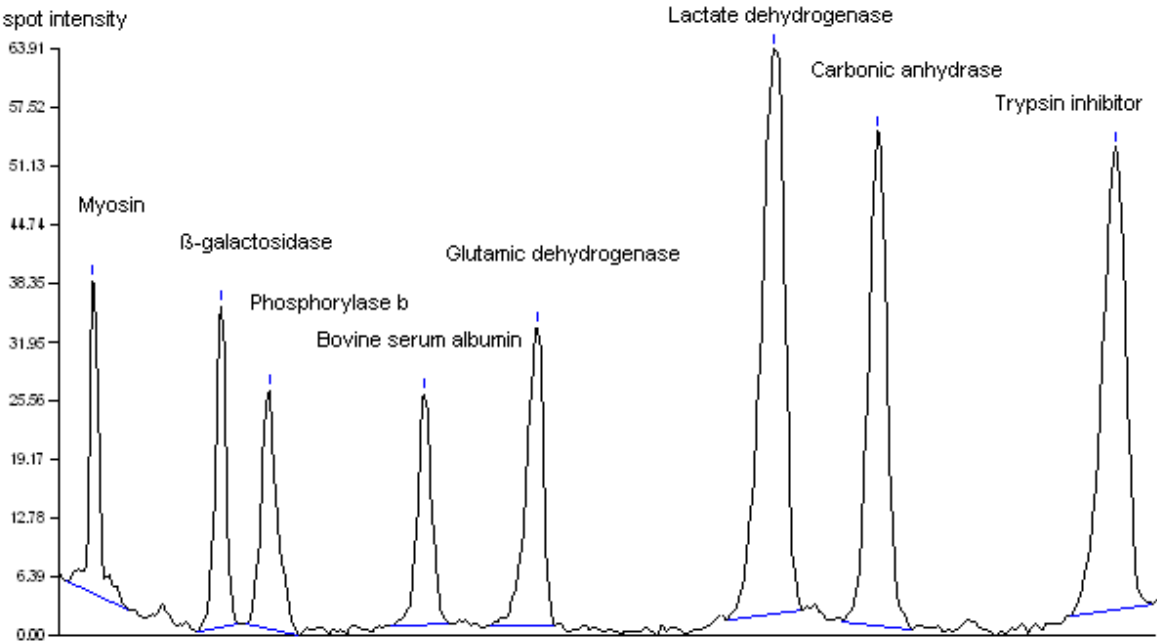


Figure S2: Linearity of Mark 12™ Unstained Standard, part 1.

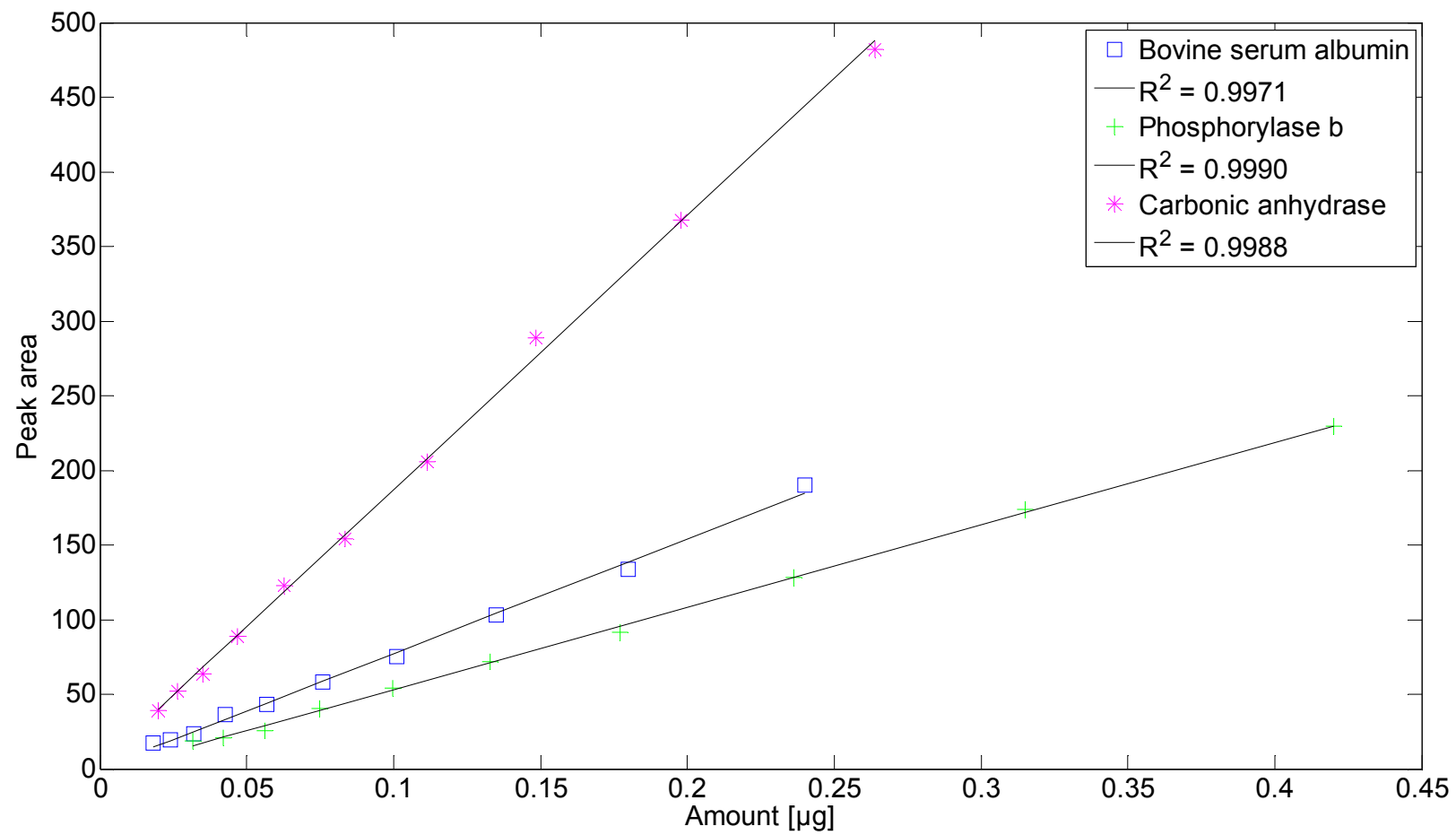


Figure S3: Linearity of Mark 12™ Unstained Standard, part 2.

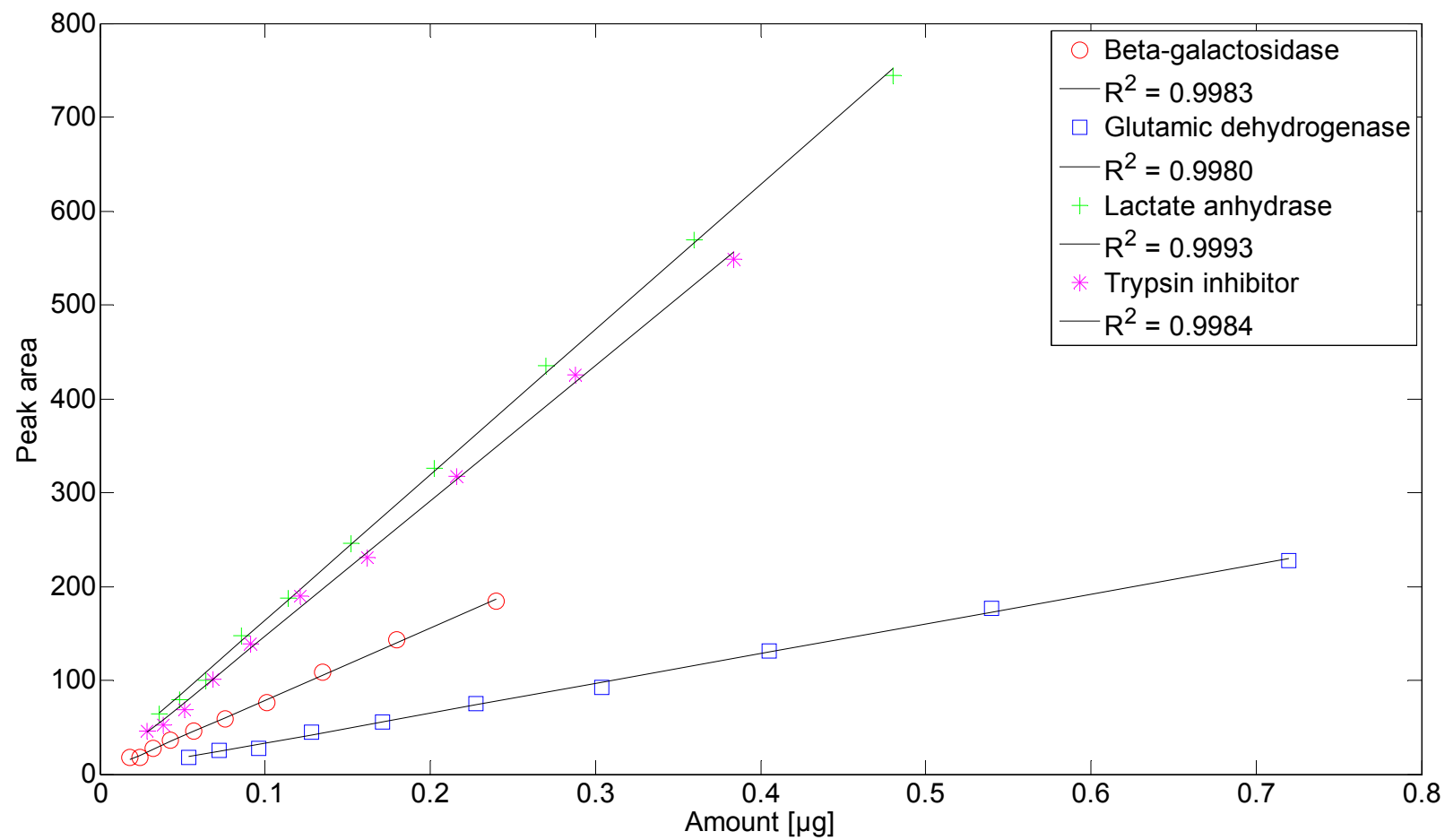


Figure S4: Regression plot for glutamic dehydrogenase with 95% confidence interval,  $R^2=0.9980$ .

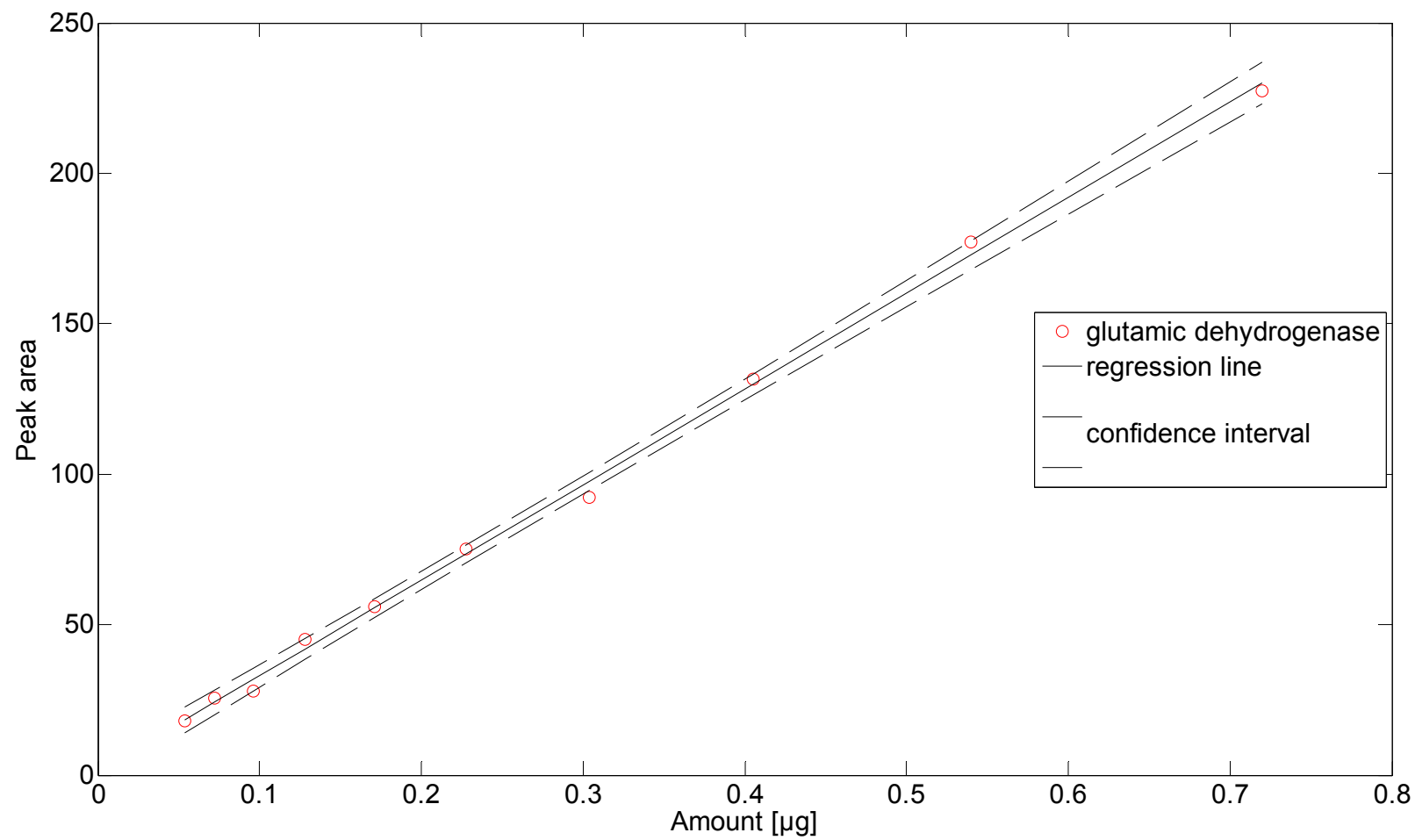


Figure S5: Regression plot for bovine serum albumin with 95% confidence interval,  $R^2=0.9971$ .

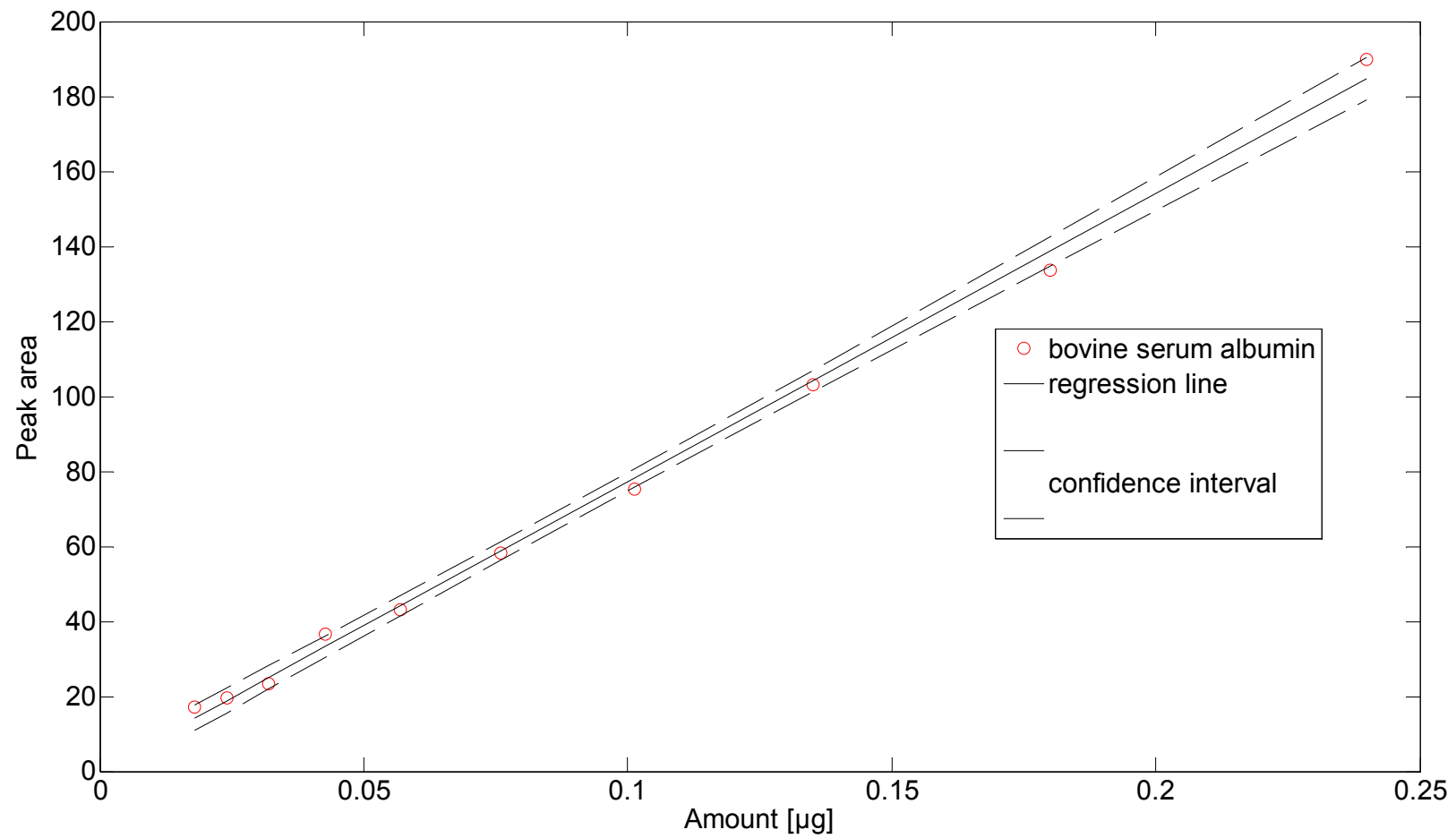


Figure S6: Exemplary workflow, corresponding to Table 4.

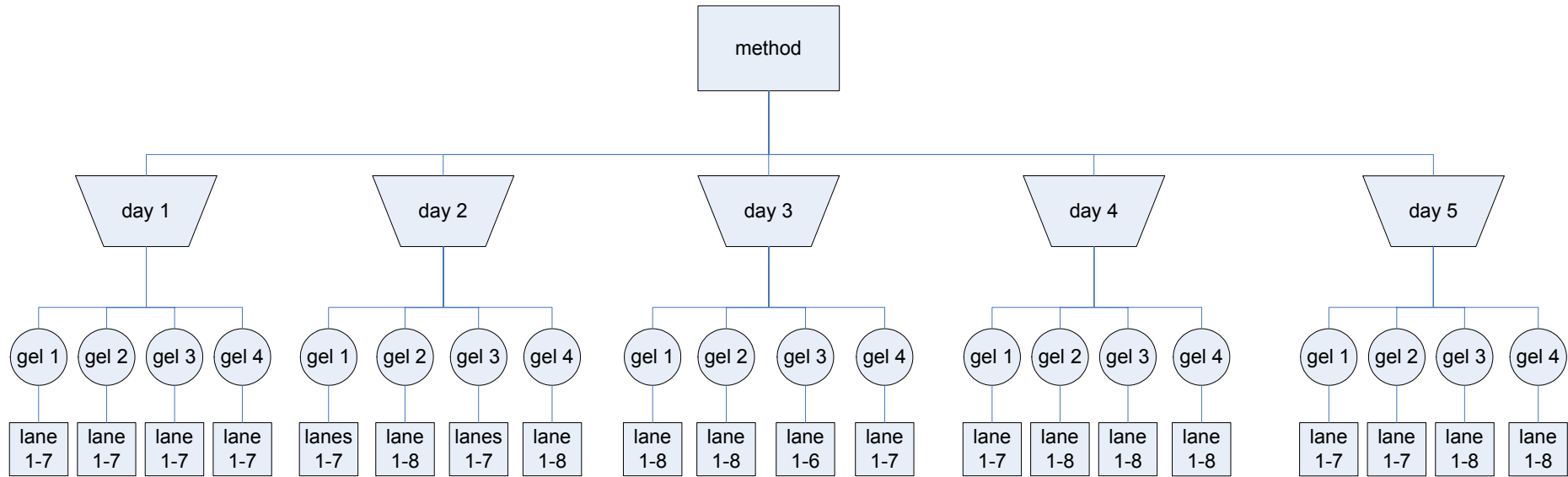


Table S1: Detector-dependant precision: Odyssey and Fla-9000.

Proteins	RSD% pooled, higher speed <sup>a</sup> , Odyssey [%]	RSD% pooled, higher speed <sup>a</sup> , Fla-9000 [%]	F <sub>0</sub>	F <sub>crit</sub>	F-test		RSD% pooled, lower speed <sup>b</sup> , Odyssey [%]	RSD% pooled, lower speed <sup>b</sup> , Fla-9000 [%]	F <sub>0</sub>	F <sub>crit</sub>	F-test	
β-galactosidase	2.11	2.63	1.54	14.25	F <sub>0</sub> < F <sub>crit</sub>	no significant difference	4.63	5.12	1.22	15.44	F <sub>0</sub> < F <sub>crit</sub>	no significant difference
Phosphorylase b	3.77	2.86	1.74	4.15	F <sub>0</sub> < F <sub>crit</sub>	no significant difference	4.51	5.20	1.33	15.44	F <sub>0</sub> < F <sub>crit</sub>	no significant difference
Bovine serum albumin	2.80	2.52	1.23	4.15	F <sub>0</sub> < F <sub>crit</sub>	no significant difference	4.77	2.73	3.05	15.44	F <sub>0</sub> < F <sub>crit</sub>	no significant difference
Glutamic dehydrogenase	2.34	2.94	1.58	14.25	F <sub>0</sub> < F <sub>crit</sub>	no significant difference	3.00	2.53	1.40	15.44	F <sub>0</sub> < F <sub>crit</sub>	no significant difference
Lactate dehydrogenase	1.24	1.22	1.03	4.15	F <sub>0</sub> < F <sub>crit</sub>	no significant difference	2.80	1.70	2.70	15.44	F <sub>0</sub> < F <sub>crit</sub>	no significant difference
Carbonic anhydrase	1.05	1.39	1.75	14.25	F <sub>0</sub> < F <sub>crit</sub>	no significant difference	2.42	1.86	1.70	15.44	F <sub>0</sub> < F <sub>crit</sub>	no significant difference
Trypsin inhibitor	1.53	1.85	1.45	14.25	F <sub>0</sub> < F <sub>crit</sub>	no significant difference	3.26	2.57	1.60	15.44	F <sub>0</sub> < F <sub>crit</sub>	no significant difference
Number of gels	n = 4	n = 16					n = 4	n = 4				

a) staining and destaining at high agitation speed (50 min<sup>-1</sup>) and room temperature

b) staining and destaining at low agitation speed (30 min<sup>-1</sup>) and room temperature

Table S2: Temperature-dependant and agitation speed-dependant precision.

Proteins	RSD% pooled <sup>a</sup> , 4 °C [%]	RSD% pooled <sup>a</sup> , 20°C [%]	F <sub>0</sub>	F <sub>crit</sub>	F-test		RSD% pooled <sup>b</sup> , lower speed [%]	RSD% pooled <sup>b</sup> , higher speed [%]	F <sub>0</sub>	F <sub>crit</sub>	F-test	
β-galactosidase	2.49	2.54	1.04	14.18	F <sub>0</sub> < F <sub>crit</sub>	no significant difference	4.87	2.54	3.69	3.05	F <sub>0</sub> > F <sub>crit</sub>	significant difference
Phosphorylase b	3.86	3.05	1.60	3.90	F <sub>0</sub> < F <sub>crit</sub>	no significant difference	4.85	3.05	2.53	3.05	F <sub>0</sub> < F <sub>crit</sub>	no significant difference
Bovine serum albumin	4.93	2.57	3.67	3.90	F <sub>0</sub> < F <sub>crit</sub>	no significant difference	3.92	2.57	2.33	3.05	F <sub>0</sub> < F <sub>crit</sub>	no significant difference
Glutamic dehydrogenase	2.71	2.84	1.10	14.18	F <sub>0</sub> < F <sub>crit</sub>	no significant difference	2.78	2.84	1.04	4.48	F <sub>0</sub> < F <sub>crit</sub>	no significant difference
Lactate dehydrogenase	2.23	1.22	3.32	3.90	F <sub>0</sub> < F <sub>crit</sub>	no significant difference	2.34	1.22	3.64	3.05	F <sub>0</sub> > F <sub>crit</sub>	significant difference
Carbonic anhydrase	2.16	1.33	2.62	3.90	F <sub>0</sub> < F <sub>crit</sub>	no significant difference	2.17	1.33	2.64	3.05	F <sub>0</sub> < F <sub>crit</sub>	no significant difference
Trypsin inhibitor	2.58	1.79	2.07	3.90	F <sub>0</sub> < F <sub>crit</sub>	no significant difference	2.95	1.79	2.70	3.05	F <sub>0</sub> < F <sub>crit</sub>	no significant difference
Number of gels	n = 4	n = 20					n = 8	n = 20				

a) temperature-dependant precision: staining and destaining at 4 °C or room temperature and constant high shaking rate

b) agitation speed-dependant precision: staining and destaining at high or low shaking rate and at room temperature



Table S3: Variance analysis of the total error and corresponding effective degrees of freedom, precision at high shaking rate and room temperature (20 gels, corresponding to Fig. 4 A in the article).

Proteins	$\hat{\sigma}_{\text{lanes}}^2$ , df <sub>lanes</sub> = 128	$\hat{\sigma}_{\text{gels}}^2$ , df <sub>gels</sub> = 15	$\hat{\sigma}_{\text{days}}^2$ , df <sub>days</sub> = 4	$\hat{\sigma}_{\text{total}}^2$	RSD% total [%]	Effective degrees of freedom df <sub>eff</sub>	Contribution to total variance [%]: lane-to-lane	Contribution to total variance [%]: gel-to-gel	Contribution to total variance [%]: day-to-day
β-galactosidase	0.030	0.026	0.245	0.301	7.88	6	10	9	81
Phosphorylase b	0.053	0.052	0.037	0.142	4.93	36	38	36	26
Bovine serum albumin	0.027	0.044	0.565	0.636	12.6	5	4	7	89
Glutamic dehydrogenase	0.100	0.377	1.287	1.764	13.0	7	6	21	73
Lactate dehydrogenase	0.114	0.238	0.302	0.653	2.97	16	17	37	46
Carbonic anhydrase	0.058	0.049	0.912	1.019	5.50	4	6	5	89
Trypsin inhibitor	0.169	0.037	0.936	1.143	4.60	5	15	3	82

Table S4: Variance analysis of the total error and corresponding effective degrees of freedom, only data sets from gels stained with the same batch of Coomassie solution were considered (12 gels, corresponding to Fig. 4 B in the article).

Proteins	$\hat{\sigma}_{\text{lanes}}^2$ , df <sub>lanes</sub> = 78	$\hat{\sigma}_{\text{gels}}^2$ , df <sub>gels</sub> = 9	$\hat{\sigma}_{\text{days}}^2$ , df <sub>days</sub> = 2	$\hat{\sigma}_{\text{total}}^2$	RSD% total [%]	Effective degrees of freedom df <sub>eff</sub>	Contribution to total variance [%]: lane-to-lane	Contribution to total variance [%]: gel-to-gel	Contribution to total variance [%]: day-to-day
β-galactosidase	0.032	0.017	0	0.049	3.18	52	65	35	0
Phosphorylase b	0.051	0.039	0	0.090	3.89	57	57	43	0
Bovine serum albumin	0.024	0.018	0	0.042	3.02	67	56	44	0
Glutamic dehydrogenase	0.056	0.020	0.004	0.079	2.71	74	70	25	5
Lactate dehydrogenase	0.109	0.221	0	0.330	2.09	17	33	67	0
Carbonic anhydrase	0.054	0.060	0	0.114	1.88	21	47	53	0
Trypsin inhibitor	0.146	0.064	0.028	0.239	2.15	41	61	26	12