

**Supplmentary Materials for, Error control  
variability in pathway-based microarray  
analysis.**

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May 7, 2009

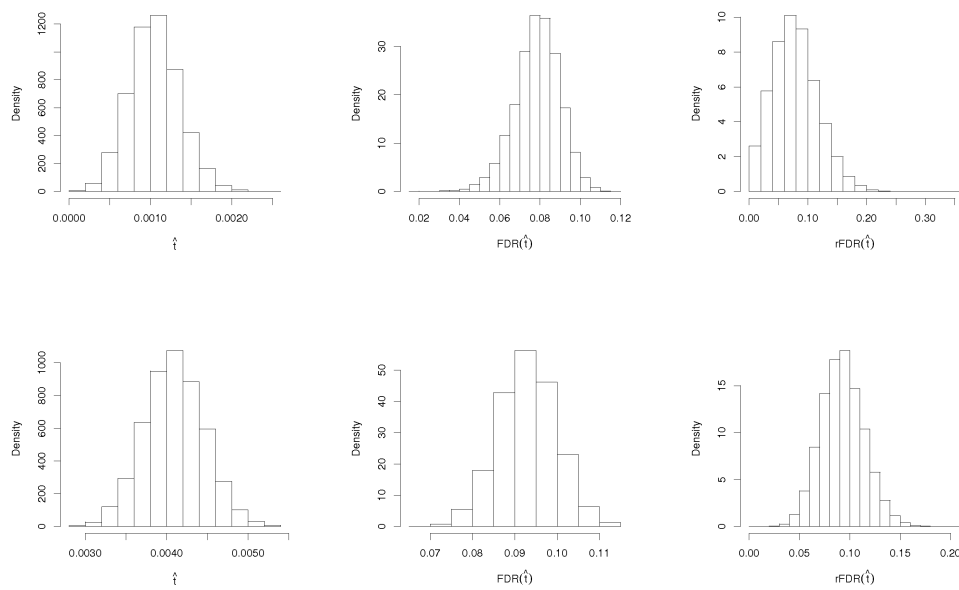


Figure 1: Simulation of sampling variability  $N = 5,000$  tests, BH control at 10%. Top row Simulation 1, bottom row Simulation 2.

Table 1: FDR Control Simulation

$\alpha$	Simulation	Measure	Mean	S.D.	Q1	Q3	Percent 0's
0.1	1	$\text{FDR}(\hat{t})$	0.06490253	0.04440780	0.02661292	0.09945102	0.15630000
0.1	1	$\text{rFDR}(\hat{t})$	0.05968226	0.15631118	0.00000000	0.00000000	0.82362300
0.1	2	$\text{FDR}(\hat{t})$	0.06466942	0.03703513	0.03612314	0.09113119	0.00040000
0.1	2	$\text{rFDR}(\hat{t})$	0.06444959	0.08895831	0.00000000	0.11111111	0.56355100
0.01	1	$\text{FDR}(\hat{t})$	0.004857392	0.007650451	0.000000000	0.009045793	0.603100000
0.01	1	$\text{rFDR}(\hat{t})$	0.001805742	0.039327402	0.000000000	0.000000000	0.997604000
0.01	2	$\text{FDR}(\hat{t})$	0.004613782	0.003818927	0.001238682	0.007217677	0.001800000
0.01	2	$\text{rFDR}(\hat{t})$	0.004574139	0.027852792	0.000000000	0.000000000	0.968182000

Table 2: Mean and S.D. of Counts of Cervical Cancer Pathways Detected with GSA.

	<i>BH</i>											
$\alpha =$	0.001	0.01	0.05	0.1	0.15	0.175	0.2	0.225	0.25	0.3	0.325	0.35
Mean	6.8	6.8	8.48	10.26	11.56	12.3	13.26	13.65	14.72	16.53	17.76	18.51
S.D.	2.4	2.4	3.27	3.29	3.38	3.46	3.33	3.49	3.76	4.22	4.66	5.03

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	<i>KBIN</i>											
$K =$	0	1	2	3	4	5	6	7	8	9	10	11
Mean	6.8	6.8	9.85	10.83	12.27	12.85	13.91	14.98	15.95	16.57	17.57	18.49
S.D.	2.4	2.4	2.59	2.49	2.4	2.41	2.35	2.31	2.55	2.61	2.85	2.88

Table 3: Mean and S.D. of Counts of Cervical Cancer Pathways Detected with GSEA.

	<i>BH</i>											
$\alpha =$	0.001	0.01	0.05	0.1	0.15	0.175	0.2	0.225	0.25	0.3	0.325	0.35
Mean	3.73	3.73	4.19	5.67	7.09	7.95	8.74	9.46	10.64	12.21	13.94	15.45
S.D.	1.57	1.57	2.29	2.7	3.45	3.88	4.34	4.79	5.41	6.17	6.62	6.87

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	<i>KBIN</i>											
$K =$	0	1	2	3	4	5	6	7	8	9	10	11
Mean	3.73	3.73	6.27	7.11	8.86	9.65	11.12	12.51	13.94	14.65	15.88	16.92
S.D.	1.57	1.57	2.18	2.5	2.78	2.96	3.08	3.32	3.44	3.54	3.67	3.86

Table 4: Mean and S.D. of Counts of Smoking Related Pathways Detected with GSA.

		<i>BH</i>											
$\alpha =$	0.001	0.01	0.05	0.1	0.15	0.175	0.2	0.225	0.25	0.3	0.325	0.35	
Mean	3.75	3.75	4.28	5.41	5.41	6.43	7.41	8.2	9.08	10	11	11.91	
S.D.	2.45	2.45	3.29	4.19	4.19	4.96	5.6	6.08	6.57	7.22	7.72	8.36	

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		<i>KBIN</i>											
$K =$	0	1	2	3	4	5	6	7	8	9	10	11	
Mean	3.75	3.75	5.11	7.15	7.95	9.3	10.01	11.09	11.72	12.64	13.5	14.01	
S.D.	2.45	2.45	3.18	3.95	4.19	4.51	4.82	5.04	5.19	5.32	5.52	5.67	

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Table 5: Mean and S.D. of Counts of Smoking Related Pathways Detected with GSEA.

		<i>BH</i>											
$\alpha =$	0.001	0.01	0.05	0.1	0.15	0.175	0.2	0.225	0.25	0.3	0.325	0.35	
Mean	0.82	0.82	0.86	0.93	1.33	1.53	1.65	2.1	2.8	3.27	3.71	4.17	
S.D.	1.12	1.12	1.36	1.68	2.07	2.61	3.03	3.22	4.23	4.68	5.3	5.74	

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		<i>KBIN</i>											
$K =$	0	1	2	3	4	5	6	7	8	9	10	11	
Mean	0.82	0.82	1.44	3.04	3.59	5.21	5.74	7.01	7.55	8.79	9.7	10.4	
S.D.	1.12	1.12	1.62	2.31	2.32	2.92	3.26	3.65	3.8	4.05	4.18	4.38	

Table 6: Mean and S.D. of Counts of AMKL Pathways Detected with GSA.

		<i>BH</i>											
$\alpha =$	0.001	0.01	0.05	0.1	0.15	0.175	0.2	0.225	0.25	0.3	0.325	0.35	
Mean	0.28	0.28	0.28	0.35	0.36	0.36	0.56	0.56	0.56	0.84	0.92	1.06	
S.D.	0.6	0.6	0.6	0.8	0.82	0.82	1.27	1.27	1.27	1.79	2.06	2.47	

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		<i>KBIN</i>											
$K =$	0	1	2	3	4	5	6	7	8	9	10	11	
Mean	0.28	0.28	1.02	1.43	2.26	2.65	3.33	4.24	5.1	5.41	6.25	6.88	
S.D.	0.6	0.6	1.14	1.38	1.81	1.97	2.26	2.6	2.88	3.03	3.44	3.66	

Table 7: Mean and S.D. of Counts of AMKL Pathways Detected with GSEA.

		<i>BH</i>											
$\alpha =$	0.001	0.01	0.05	0.1	0.15	0.175	0.2	0.225	0.25	0.3	0.325	0.35	
Mean	0.33	0.33	0.33	0.33	0.37	0.45	0.67	0.67	0.68	0.99	1.04	1.15	
S.D.	0.65	0.65	0.65	0.65	0.75	1.07	1.26	1.26	1.29	1.84	1.99	2.29	

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		<i>KBIN</i>											
$K =$	0	1	2	3	4	5	6	7	8	9	10	11	
Mean	0.33	0.33	1.25	1.64	2.51	2.95	3.72	4.38	5.2	5.62	6.45	7.21	
S.D.	0.65	0.65	1.14	1.37	1.67	1.81	2.14	2.22	2.54	2.6	2.68	2.93	