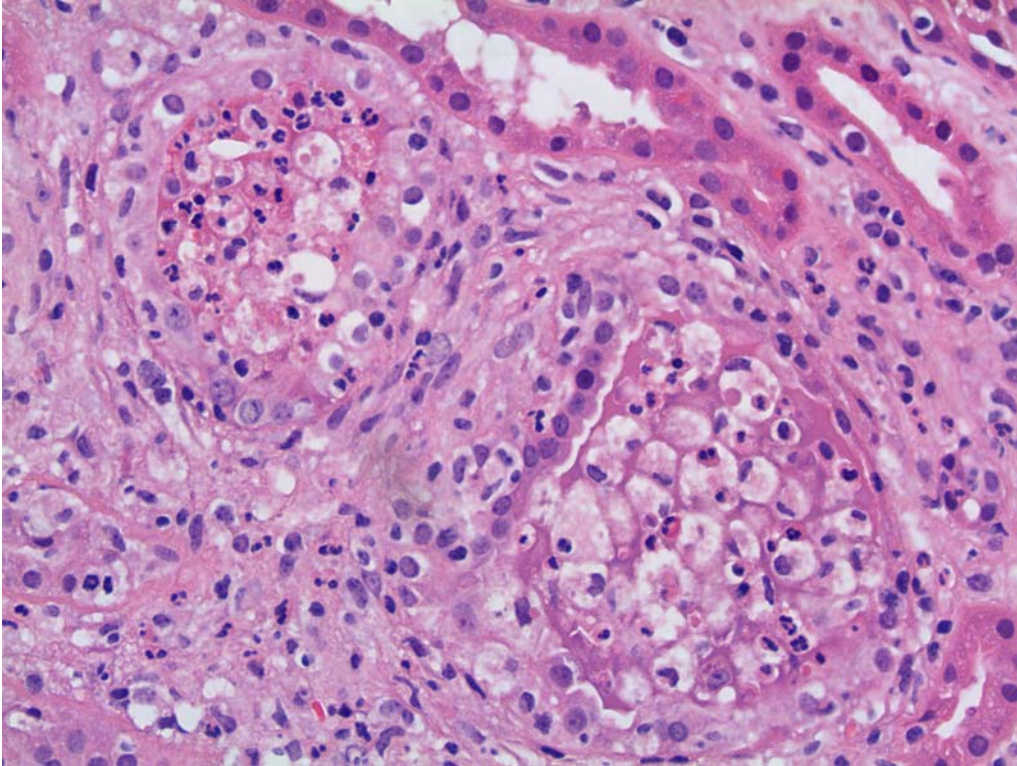
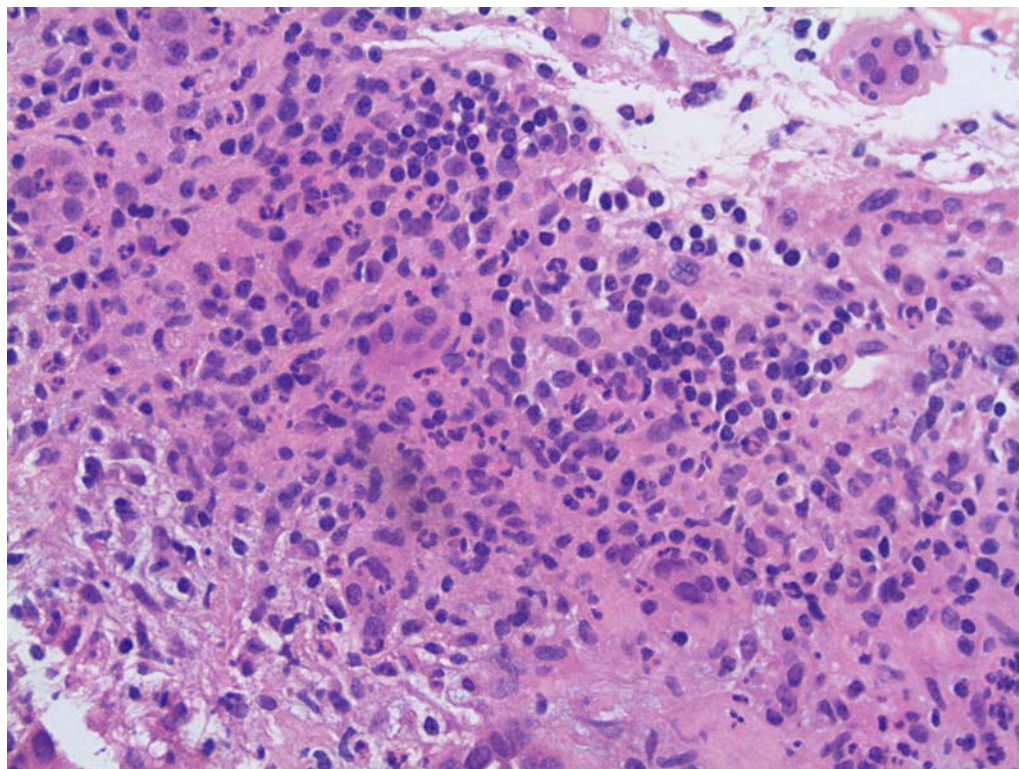


SDC Figure S1A. H&E stained biopsy I5 from Table 4 (400x). Polymorphonuclear cells in tubules and in the interstitium.



SDC Figure S1B. H&E stained biopsy I8 from Table 4 (400x). Prominence of polymorphonuclear leukocytes in the interstitium, infiltrating and destroying tubules.



SDC Table 1. The 10 of 49 patients with graft loss within one year of the diagnostic biopsy.

	Age	Race	Sex	Transplant type	Duration transplant to biopsy	Biopsy diagnosis	Duration between biopsy and urine culture	Urine culture result	CFU/ml	Baseline S. cr. before biopsy	S. cr. 1 month post-biopsy	S. cr. 1 year post-biopsy
1	21	AA	M	Cad	3 weeks	Mixed inflammation with PMNs, microabscesses, possible concomitant rejection	13 days before biopsy	<i>C. lusitanae</i>	1000 to 5000	DGF	3.5	lost
2	27	AA	F	Cad	1 month	Pyelonephritis, mild C4d positive, possible early rejection	1 month, 13 days before biopsy	<i>E. fecalis</i>	> 100,000	DGF	lost	n/a
3	44	AA	M	Cad	2 weeks	Pyelonephritis, Banff Grade 2A rejection, C4d negative	day of biopsy	<i>E. fecalis</i>	100,000	DGF	lost	n/a
4	68	AA	M	Cad	4 months, 3 weeks	Pyelonephritis	3 months, 10 days before biopsy	<i>Enterobacter</i>	100,000	2	lost	n/a
5	44	C	M	Cad	1 year, 2 months	Mixed inflammation with PMNs, cannot exclude pyelonephritis, mild C4d positive, transplant glomerulopathy	7 days before biopsy	<i>E. fecalis</i> , <i>P. rettgeri</i>	100,000	DGF	lost	n/a
6	26	C	F	Cad	1 week	Mixed inflammation with PMNs, suggestive of pyelonephritis.	11 days after biopsy	<i>E. fecalis</i>	100,000	DGF	lost	n/a
7	30	AA	F	Cad	2 weeks	Mixed inflammation with PMNs, suggestive of pyelonephritis	1 month after biopsy	<i>K. oxytoca</i> , <i>C. koseri</i>	< 50,000	5	lost	n/a
8	15	C	F	LRD	1 year	Pyelonephritis, recurrent aggressive IgA nephropathy	7 days before biopsy	<i>E. coli</i>	50,000 to 100,000	6.2	4.2	lost
9	71	C	F	LRD	1 year 1 month	Mixed inflammation with PMNs, neutrophilic tubulitis, mild interstitial fibrosis, mild focal C4d staining, history of desensitization protocol	6 months before biopsy	<i>E. coli</i>	> 100,000	1.5	1.7	lost
10	76	AA	M	Cad	3 months	Acute pyelonephritis, moderate interstitial fibrosis	1 month 15 days before biopsy	<i>E. coli</i>	> 100,000	1.3	lost	n/a

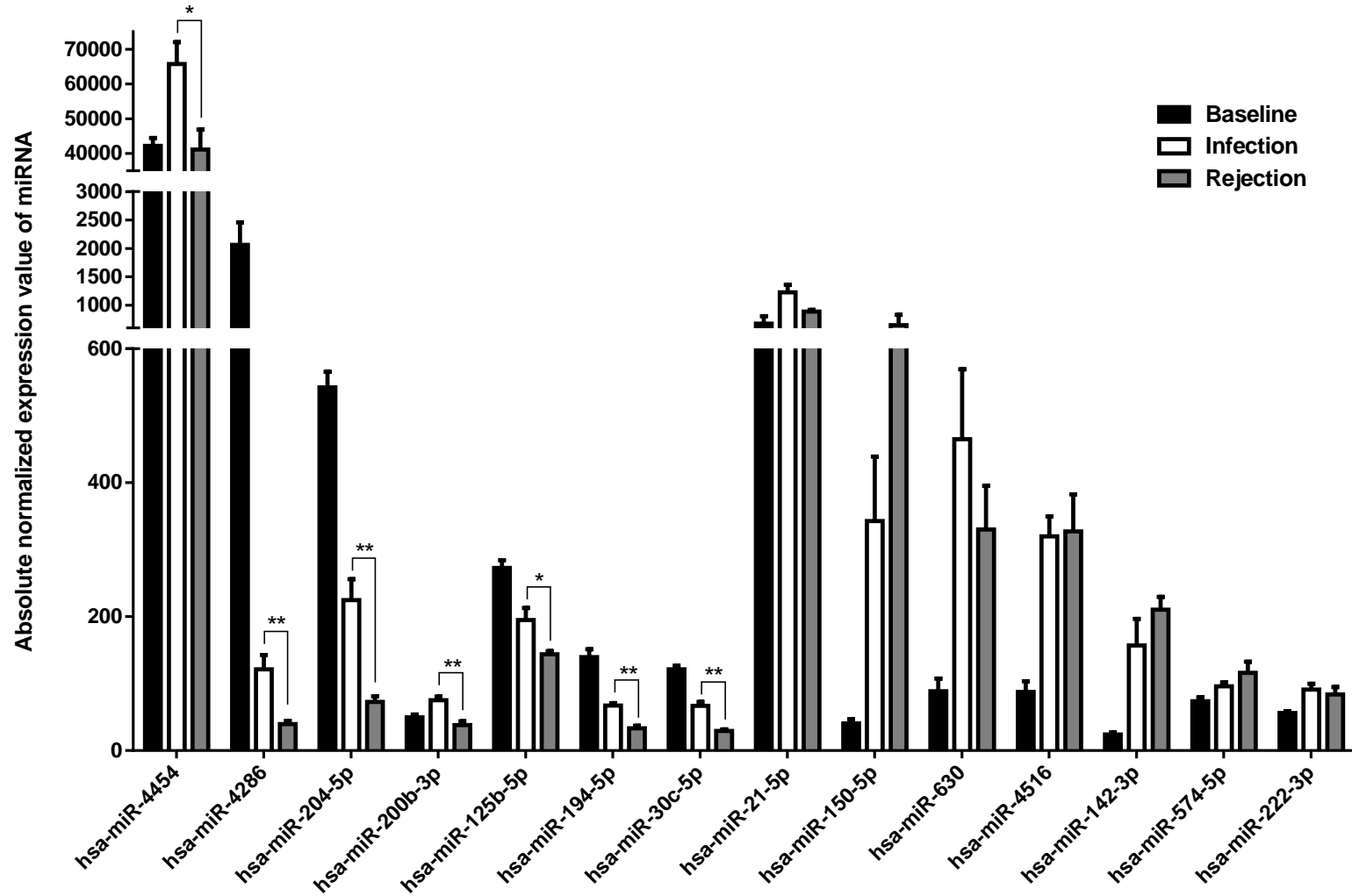
DGF= delayed graft function, PMNs=polymorphonuclear leukocytes, *C. koseri*=*Citrobacter koseri*, *C. lusitanae*=*Candida lusitanae*, *P. rettgeri*=*Providencia rettgeri*, *K. oxytoca*=*Klebsiella oxytoca*, S. cr=serum creatinine in mg/dl.

SDC Table 2. Baseline biopsies, and unequivocal rejection biopsies analyzed by Nanaostring nCounter. Biopsy features and follow up serum creatinine levels at 1 year are described.

	Biopsy	Age	Race	Sex	Type of transplant	Duration between transplant to biopsy	Biopsy diagnosis	Duration between biopsy and urine culture result	Urine culture result	Colony count (CFU)	Baseline S. Cr. before biopsy	S. cr. 1 month post biopsy	S. cr. 1 year post biopsy
1	B1	46	C	F	LUD	0 days	Baseline biopsy, unremarkable renal cortex	N/A	Negative	N/A	N/A	N/A	N/A
2	B2	48	C	F	LUD	0 days	Baseline biopsy, unremarkable renal cortex	day of biopsy	Negative	N/A	N/A	N/A	N/A
3	B3	61	C	M	LRD	0 days	Baseline biopsy, unremarkable renal cortex	N/A	Negative	N/A	N/A	N/A	N/A
4	B4	58	C	M	LUD	0 days	Baseline biopsy, unremarkable renal cortex	5 days after biopsy	Negative	N/A	N/A	N/A	N/A
5	R1	44	C	F	Cad	0 days	Acute cellular rejection Banff grade 2B	on day of biopsy	Negative	N/A	DGF	1.3	1.1
6	R2	29	C	F	Cad	6 months	Acute cellular rejection Banff grade IIA, mild diffuse C4d	4 days before biopsy	Enterococcus faecalis (UTI)	10,000 to 50,000	0.7	1.5	dialysis
7	R3	23	C	F	LUD	4 months	Acute cellular and humoral rejection Banff grade 1B	2 days before biopsy	Negative	N/A	0.9	1.2	0.9
8	R4	61	AA	F	Cad	19 days	Acute cellular rejection Banff grade IIB	6 days before biopsy	Negative	N/A	DGF	1.3	1.5
9	R5	51	C	F	Cad	1 month, 9 days	Acute cellular rejection Banff grade 1B	7 days before biopsy	MRSE; E. coli (UTI)	> 100,000	0.9	1.8	dialysis

B=baseline; R=rejection, Ph=Phillipino; LUD=living unrelated donor; LRD=living related donor; Cad=cadaveric donor; S. cr.=serum creatinine in mg/dl. MRSE = methicillin resistant Staphylococcus epidermidis; UTI=urinary tract infection.

SDC Figure S2. 14 miRs showing statistically significant differential expression between normal kidney (baseline biopsies) and the four biopsies with unequivocal pyelonephritis (I1, I2, I3, I6).



Graph shows means (+/- SEM) of absolute normalized values of miRNA expression for baseline, infection and rejection biopsies. Graphs were plotted using GRAPHPAD PRISM software and p values were calculated by unpaired t test. (\*  $p < 0.05$ , \*\*  $p < 0.01$ )

SDC Table 3. Thirty differentially expressed miRNAs between acute rejection and normal baseline biopsies. 14 of these miRNAs are differentially expressed between rejection and pyelonephritis. Two-tailed, two-sample unequal variance T-test, using cut-off p-value of 0.05).

Sample	Baseline biopsies (normal kidney)				Acute Rejection					Acute pyelonephritis				Rejection vs baseline		Infection vs rejection	
	B1	B2	B3	B4	R12	R2	R3	R4	R5	I1	I2	I3	I6	t-test	fold change	t-test	fold change
hsa-miR-1260a	1114.88	2447.8	3501.8	3850.72	1891.32	2045.91	904.3	1754.93	1481.85	2305.54	2465.99	2843.62	2105.34	<b>0.0399035</b>	0.4945743	<b>0.0116104</b>	1.5711104
hsa-miR-125b-5p	631.86	1178.05	1625.38	1408.18	698.19	922.49	892.13	899.48	789.05	1000.77	2662.19	2188.41	1254.12	<b>0.0376787</b>	0.5985369	0.152749	2.3212316
hsa-miR-150-5p	15.15	30.57	39.69	52.02	261.42	650.12	209.34	1138.62	968.52	66.36	513.28	407.1	383.71	<b>0.030812</b>	15.839156	0.2159742	0.5094661
hsa-miR-630	69.51	90.53	119.92	55.65	482.19	345.6	119.28	441.41	263.69	569.44	680.66	200.06	409.96	<b>0.0182907</b>	3.7252988	0.4113685	1.4628842
hsa-miR-4286	532.04	2307.9	2592.49	1289.62	51.81	41.08	25.56	32.12	48.13	70.84	123.67	116.19	174.69	<b>0.0361201</b>	0.0192601	<b>0.0507684</b>	2.6061064
hsa-miR-4516	48.12	101.11	106.12	55.65	247.87	367.03	323.75	510.42	187.49	403.54	320.8	284.8	270.61	<b>0.0102828</b>	3.7353013	0.8943912	1.0277045
hsa-miR-1972	127.44	47.03	50.9	131.87	291.71	271.48	267.76	536.59	436.13	420.58	181.32	76.88	155.5	<b>0.0039929</b>	4.7093211	0.3233549	0.6272212
hsa-miR-125a-5p	144.37	255.13	269.17	293.98	143.46	161.64	131.45	140.39	141.37	168.59	160.87	214.04	236.28	<b>0.0026147</b>	0.5266975	0.1427883	1.2610618
hsa-miR-204-5p	230.82	545.52	501.24	580.69	87.67	71.44	43.82	70.2	91.24	185.63	175.74	312.75	224.17	<b>0.0008012</b>	0.1343341	<b>0.0701865</b>	3.0834957
hsa-miR-126-3p	60.6	191.64	215.68	156.06	103.61	100.02	58.42	129.69	105.27	118.37	377.52	254.22	167.62	<b>0.0147669</b>	0.5293159	0.1791373	2.5154088
hsa-miR-342-3p	71.3	104.64	89.72	65.33	156.22	303.63	141.18	177.28	145.38	79.81	353.35	234.13	195.89	<b>0.0291523</b>	2.1341369	0.6910166	1.2040295
hsa-miR-30a-5p	142.59	348.01	339.05	216.55	76.51	107.16	76.68	76.15	84.22	201.77	245.48	217.53	253.45	<b>0.0339377</b>	0.2793595	<b>0.002666</b>	2.6335013
hsa-miR-142-3p	9.8	22.34	19.84	30.24	203.24	201.82	148.49	258.18	241.63	76.22	265.01	134.54	152.47	<b>0.0004898</b>	8.727092	0.4543819	0.7527816
hsa-miR-99b-5p	106.05	174	199.29	156.06	143.46	114.31	70.59	108.27	76.2	201.77	200.85	187.83	168.63	<b>0.0080673</b>	0.5812751	<b>0.0012802</b>	1.918927
hsa-miR-30d-5p	129.22	273.94	270.03	180.26	117.96	133.06	62.07	95.18	81.21	231.36	254.78	183.46	209.02	<b>0.02792</b>	0.4055176	<b>0.0099113</b>	2.2799706
hsa-miR-223-3p	12.48	28.22	12.94	25.41	102.02	95.55	51.12	184.42	121.32	77.12	221.31	83.87	78.76	<b>0.0135894</b>	4.9971158	0.7709154	1.1492283
hsa-miR-4443	75.75	47.03	63.84	79.85	115.57	118.77	114.41	89.23	101.26	50.22	69.74	87.36	76.74	<b>0.0215786</b>	1.6964346	<b>0.0468403</b>	0.6407784
hsa-miR-130a-3p	59.71	102.29	92.31	100.41	41.44	74.12	38.95	59.49	51.13	82.5	185.04	104.83	138.34	<b>0.0010064</b>	0.5392292	<b>0.1446966</b>	2.3408014
hsa-miR-888-5p	61.49	65.84	81.1	42.34	145.85	175.92	155.79	96.37	69.18	156.03	108.79	104.83	67.65	<b>0.029356</b>	2.0385989	0.840814	0.957975
hsa-miR-1276	40.1	25.87	25.02	38.71	93.25	115.2	93.72	105.89	120.31	160.52	61.37	48.92	45.44	<b>4.271E-05</b>	3.538192	0.706688	0.8542309
hsa-let-7i-5p	32.08	32.92	38.82	19.36	68.54	78.59	64.51	65.44	66.17	98.64	172.95	67.27	70.68	<b>0.0106967</b>	2.2607025	0.292634	1.6453508
hsa-miR-23b-3p	44.56	89.35	112.15	127.03	27.9	27.68	35.3	33.31	40.1	71.74	115.3	95.22	95.93	<b>0.0163503</b>	0.3000457	<b>0.0358985</b>	2.8634325
hsa-miR-99a-5p	41.89	77.6	87.14	105.25	35.87	42.86	36.51	35.69	29.08	47.53	125.53	104.83	110.06	<b>0.0163781</b>	0.400037	<b>0.1347428</b>	2.5729126
hsa-miR-30c-5p	48.12	131.68	119.92	112.51	22.32	36.61	25.56	32.12	29.08	50.22	71.6	70.76	75.73	<b>0.0008794</b>	0.2400758	<b>0.0263116</b>	2.2030796
hsa-miR-423-5p	23.17	48.2	55.21	54.44	47.82	41.97	40.16	51.16	40.1	47.53	71.6	63.77	56.55	<b>0.0419063</b>	0.8408362	<b>0.1316638</b>	1.3780269
hsa-miR-194-5p	56.15	148.14	154.43	116.14	32.68	46.44	25.56	28.55	34.09	63.67	76.25	60.28	68.66	<b>0.0077571</b>	0.239765	<b>0.0047437</b>	1.9941828
hsa-miR-100-5p	37.43	50.56	58.67	71.38	31.88	34.83	26.78	42.83	41.11	43.04	98.57	71.64	47.46	<b>0.0354604</b>	0.5894358	0.1524619	2.0031374
hsa-miR-1290	57.04	45.85	46.59	25.41	82.09	102.7	87.63	54.73	39.1	103.13	63.23	54.16	56.55	<b>0.0458973</b>	1.8646585	0.9898017	1.003504
hsa-miR-495	32.97	38.8	31.06	44.76	74.12	70.55	76.68	44.02	61.16	72.64	48.35	47.18	43.42	<b>0.0090591</b>	1.7092828	0.4154472	0.8583693

hsa-miR-27b-3p	49.02	88.18	101.8	65.33	29.49	34.83	25.56	22.61	21.05	58.29	84.62	75.13	60.59	<b>0.0263964</b>	0.3138302	<b>0.0187283</b>	2.721282
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