

Supplemental Material to:

**Cheryl C.Y. Li, Sally Eaton, Paul E. Young, Maggie Lee,
Rupert Shuttleworth, David T. Humphreys,
Georges E. Grau, Valery Combes, Mary Bebawy,
Joyce Gong, Susan Brammah, Michael E. Buckland,
Catherine M. Suter**

**Glioma microvesicles carry selectively packaged
coding and noncoding RNAs which alter
gene expression in recipient cells**

2012; 10(8)

<http://dx.doi.org/10.4161/rna.25281>

www.landesbioscience.com/journals/rnabiology/article/25281/

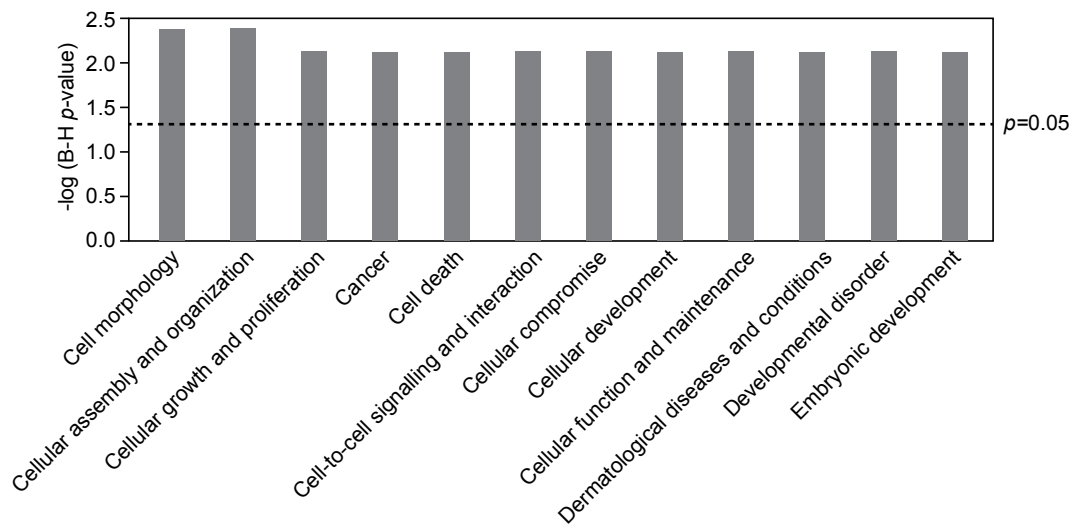


Figure S1: Bar graph showing $-\log$ Benjamini-Hochberg corrected p -values of functional ontologies identified as being significantly overrepresented in genes enriched in microvesicles relative to U251 cells.

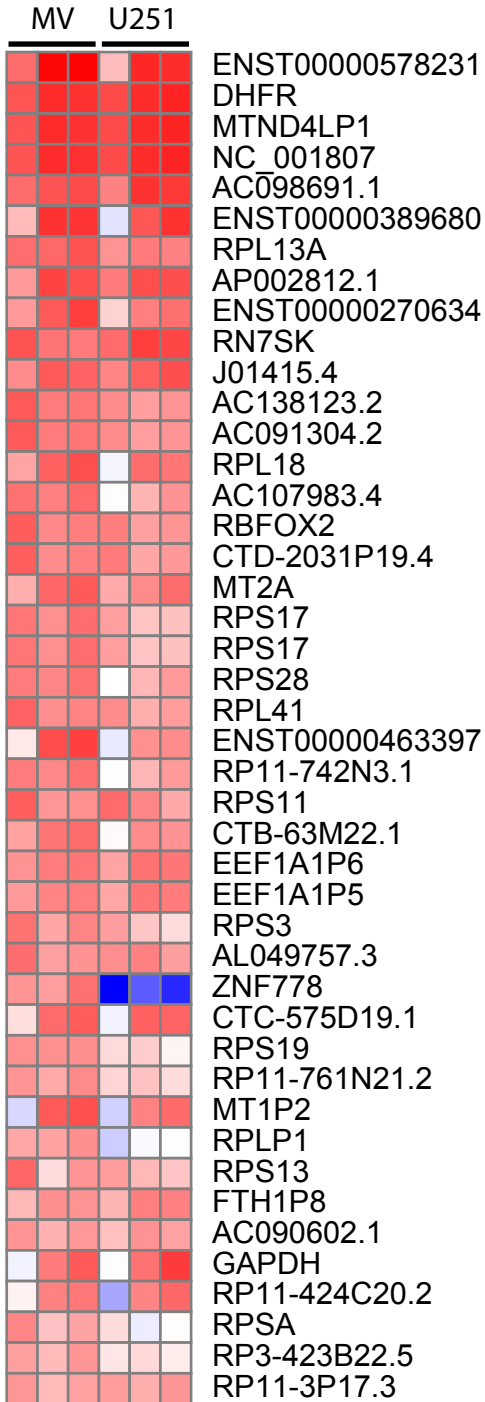
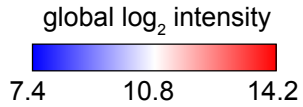


Figure S2: Heatmap showing global expression levels of the most abundant genes (>12 log₂ intensity units) in microvesicles.

Table S1: Proteins identified in microvesicles by mass spectrometry

Identified Proteins (112 total)	Symbol	Accession Number	Number of assigned spectra	on exocart?	top 25 exosome proteins?
Isoform 1 of EGF-like repeat and discoidin I-like domain-containing prote	EDIL3	IPI00306046	95	1	
Vimentin	Vim	IPI00418471	52	1	
Elongation factor 1-alpha 1	EEF1A1	IPI00396485	51	1	1
Basement membrane-specific heparan sulfate proteoglycan core proteir	HSPG2	IPI00024284	49	1	
Isoform 1 of Clathrin heavy chain 1	CLTC	IPI00024067	49	1	
Isoform 2 of Filamin-A	FLNA	IPI00302592	44	1	
fibronectin 1 isoform 2 preproprotein	FN1	IPI00845263	52	1	
Isoform 1 of Collagen alpha-1(XII) chain	COL12A1	IPI00329573	41	1	
Isoform 1 of Myosin-9	MYH9	IPI00019502	33	1	
ubiquitin and ribosomal protein S27a precursor	RPS27A	IPI00179330	38	1	
Isoform 1 of Tenascin	TNC	IPI00031008	32	1	
cDNA FLJ56065, highly similar to Pyruvate kinase isozyme M1	PKM2	IPI00479186	34	1	1
Isoform 1 of CD109 antigen	CD109	IPI00152540	31	1	
Histone H4		IPI00453473	31	1	
Prostaglandin F2 receptor negative regulator	PTGFRN	IPI00022048	28	1	
Isoform 1 of Heat shock cognate 71 kDa protein	HSPA8	IPI00003865	31	1	1
Isoform Long of Sodium/potassium-transporting ATPase subunit alpha-1	ATP1A1	IPI00006482	26	1	
Ras GTPase-activating-like protein IQGAP1	IQGAP1	IPI00009342	28	1	
D-3-phosphoglycerate dehydrogenase	PHGDH	IPI00011200	27	1	
Hemoglobin subunit alpha	HBA1	IPI00410714	26	1	
Heat shock protein HSP 90-beta	HSP90AB1	IPI00414676	23	1	1
Tubulin alpha-1A chain	TUBA1A	IPI00180675	25	1	
Moesin	MSN	IPI00219365	23	1	1
annexin A2 isoform 1	ANXA2	IPI00418169	25	1	1
Isoform alpha-enolase of Alpha-enolase	ENO1	IPI00465248	20	1	1
Cytoplasmic dynein 1 heavy chain 1	DYNC1H1	IPI00456969	18	1	
Tax_Id=9606 Gene_Symbol=MFGE8 Isoform 1 of Lactadherin	MFGE8	IPI00966900	24	1	
Isoform 1 of Polyadenylate-binding protein 1	PABPC1	IPI00008524	17	1	
Annexin A1	ANXA1	IPI00218918	25	1	
Isoform 1 of Filamin-B	FLNB	IPI00289334	21	1	

Tubulin, beta	TUBB	IPI00645452	21	1	
Phosphoglycerate kinase 1	PGK1	IPI00169383	22	1	1
Fatty acid synthase	FASN	IPI00026781	21	1	
PDCD6IP protein	PDCD6IP	IPI00246058	19	1	1
Isoform 1 of Myoferlin	MYOF	IPI00021048	16	0	
Histone H2B type 1-L	HIST1H2BL	IPI00018534	12	1	
Profilin-1	PFN1	IPI00216691	13	1	
Peroxiredoxin-1	PRDX1	IPI00000874	14	1	
Alpha-actinin-4	ACTN4	IPI00013808	11	1	
Elongation factor 2	EEF2	IPI00186290	12	1	1
Isoform 1 of Triosephosphate isomerase	TPI1	IPI00465028	15	1	
40S ribosomal protein S18	RPS18	IPI00013296	12	1	
Talin-1	TLN1	IPI00298994	13	1	
Agrin	AGRN	IPI00374563	13	1	
Fructose-bisphosphate aldolase A	ALDOA	IPI00465439	13	1	1
Neutral amino acid transporter B(0)	SLC1A5	IPI00019472	14	1	
Isoform 2 of Collagen alpha-1(XVIII) chain	COL18A1	IPI00022822	12	1	
CD9 antigen	CD9	IPI00215997	11	1	1
Thrombospondin-1	THBS1	IPI00296099	10	1	
Peptidyl-prolyl cis-trans isomerase A	PPIA	IPI00419585	12	1	
Transgelin-2	TAGLN2	IPI00550363	13	1	
cDNA FLJ54957, highly similar to Transketolase	TKT	IPI00643920	9	1	
Isoform 1 of Ras-related protein Rab-1A	RAB1A	IPI00005719	10	1	
Multifunctional protein ADE2	PAICS	IPI00217223	12	1	
Glyceraldehyde-3-phosphate dehydrogenase	GAPDH	IPI00219018	13	1	1
Transforming protein RhoA	RHOA	IPI00478231	11	1	
Ezrin	EZR	IPI00843975	11	1	
cDNA FLJ55606, highly similar to Alpha-2-HS-glycoprotein	AHSG	IPI00022431	8	1	
ADP/ATP translocase 2	SLC25A5	IPI00007188	12	1	
Guanine nucleotide-binding protein G(I)/G(S)/G(T) subunit beta-1	GNB1	IPI00026268	11	1	
Isoform 12 of CD44 antigen	CD44	IPI00297160	8	1	
Annexin A5	ANXA5	IPI00329801	11	1	1
Isoform 1 of Guanine nucleotide-binding protein G(i), alpha-2 subunit	GNAI2	IPI00748145	11	1	
Neuronal membrane glycoprotein M6-a	GPM6A	IPI00019952	10	1	

4F2 cell-surface antigen heavy chain	SLC3A2	IPI00027493	11	1	
cDNA FLJ57754, highly similar to Homo sapiens profilin 2 (PFN2), transcr	PFN2	IPI00107555	10	1	
HLA class I histocompatibility antigen, A-69 alpha chain	HLA-A	IPI00760554	10	1	
Isoform A of Ras-related C3 botulinum toxin substrate 1	RAC1	IPI00010271	8	1	
Cofilin-1	CFL1	IPI00012011	7	1	1
Ras-related protein Rab-11B	RAB11B	IPI00020436	9	1	
Peroxiredoxin-6	PRDX6	IPI00220301	8	1	
Malate dehydrogenase, mitochondrial	MDH2	IPI00291006	8	1	
Laminin subunit alpha-5	LAMA5	IPI00783665	8	1	
Histone H1.2	HIST1H1C	IPI00217465	10	1	
14-3-3 protein epsilon	YWHAE	IPI00000816	6	1	1
cDNA FLJ56389, highly similar to Elongation factor 1-gamma	EEF1G	IPI00000875	8	1	
60S acidic ribosomal protein P0	RPLP0	IPI00008530	9	1	
Ras-related protein Rab-7a	RAB7A	IPI00016342	6	1	
Poly(rC)-binding protein 1	PCBP1	IPI00016610	7	1	
Insulin-like growth factor-binding protein 7	IGFBP7	IPI00016915	6	1	
Isoform Alpha-3A of Integrin alpha-3	ITGA3	IPI00215995	8	1	
Isoform Beta-1A of Integrin beta-1	ITGB1	IPI00217563	8	1	
Isoform 2 of Basigin	BSG	IPI00019906	8	1	
Isoform 1 of Plectin-1	PLEC1	IPI00014898	6	1	
14-3-3 protein theta	YWHAQ	IPI00018146	7	1	
Peroxiredoxin-2	PRDX2	IPI00027350	6	1	
Glucose-6-phosphate isomerase	GPI	IPI00027497	7	1	
Teneurin-2	ODZ2	IPI00182194	7	1	
L-lactate dehydrogenase B chain	LDHB	IPI00219217	6	1	
40S ribosomal protein S16	RPS16	IPI00221092	7	1	
Guanine nucleotide-binding protein subunit beta-2-like 1	GNB2L1	IPI00848226	8	1	
Eukaryotic initiation factor 4A-I	EIF4A1	IPI00025491	8	1	
Galectin-3-binding protein	LGALS3BP	IPI00023673	6	1	
cDNA FLJ60299, highly similar to Rab GDP dissociation inhibitor beta	GDI2	IPI00031461	6	1	
T-complex protein 1 subunit alpha	TCP1	IPI00290566	6	1	
Isoform 2 of Polyadenylate-binding protein 4	PABPC4	IPI00555747	7	1	
Ras-related protein Rab-10	RAB10	IPI00016513	5	1	
heat shock 90kDa protein 1, alpha isoform 1	HSP90AA1	IPI00382470	7	1	1

Alpha-2-macroglobulin	A2M	IPI00478003	6	1
Ras-related protein Rap-1b	RAP1B	IPI00015148	6	1
Isoform 1 of 60S ribosomal protein L12	RPL12	IPI00024933	6	1
Isoform 1 of Nucleoside diphosphate kinase B	NME2	IPI00026260	6	1
Isoform XD of Plasma membrane calcium-transporting ATPase 4	ATP2B4	IPI00012490	6	1
Protein kinase C and casein kinase substrate in neurons protein 3	PACSIN3	IPI00329572	5	1
Phosphatidylethanolamine-binding protein 1	PEBP1	IPI00219446	6	1
Chloride intracellular channel protein 1	CLIC1	IPI00010896	5	1
Ras-related protein Rab-5C	RAB5C	IPI00016339	5	1
Flotillin-1	FLOT1	IPI00027438	5	1
Isoform 1 of Immunoglobulin superfamily member 8	IGSF8	IPI00056478	5	1
Thioredoxin	TXN	IPI00216298	5	1
Isoform 1 of 60S ribosomal protein L11	RPL11	IPI00376798	5	1

Total number of identified proteins on Exocart

111

Total number of identified proteins in top 25 of exosome proteins

17



Table S2: List of miRNAs with enriched miRNA* sequences in microvesicles compared to U2

miRBase ENSG Accession	Name	chr	start	end
MI0000113	hsa-miR-106a	X	133304273	133304297
	hsa-miR-106a*	X	133304239	133304261
MI0000748	hsa-miR-130b*	22	22007605	22007629
	hsa-miR-130b	22	22007643	22007669
MI0000809	hsa-miR-151-3p	8	141742683	141742708
	hsa-miR-151-5p	8	141742719	141742745
MI0000115	hsa-miR-16	3	160122542	160122574
	hsa-miR-16-2*	3	160122584	160122608
MI0000289	hsa-miR-181a*	1	198828198	198828221
	hsa-miR-181a	1	198828226	198828259
MI0001518	hsa-miR-18b*	X	133304072	133304098
	hsa-miR-18b	X	133304113	133304136
MI0000487	hsa-miR-193a-5p	17	29887035	29887057
	hsa-miR-193a-3p	17	29887069	29887093
MI0000816	hsa-miR-335*	7	130136002	130136029
	hsa-miR-335	7	130135967	130135990
MI0000786	hsa-miR-378a-5p	5	149112392	149112415
	hsa-miR-378a-3p	5	149112430	149112453
MI0001733	hsa-miR-452*	X	151128111	151128133
	hsa-miR-452	X	151128148	151128171
MI0003186	hsa-miR-502-5p	X	49779220	49779249
	hsa-miR-502-3p	X	49779257	49779281
MI0019116	hsa-mir-5100	10	43493081	43493106
	hsa-mir-5100	10	43493040	43493062
MI0005561	hsa-miR-877	6	30552109	30552133
	hsa-miR-877*	6	30552174	30552197
MI0000095	hsa-miR-93*	7	99691396	99691423
	hsa-miR-93	7	99691435	99691462
MI0000468	hsa-miR-9-3p	15	89911302	89911331
	hsa-miR-9-5p	15	89911263	89911295

51 cells

Normalised count in MVs	Normalised count in U251 cells
38	4874
88	258
268	569
218	641
1999	4722
1992	18570
362	5382
1153	4712
56	513
320	324
104	128
0	196
38	52
0	74
230	1583
252	1141
635	564
167	1041
86	361
0	778
27	44
25	226
313	0
0	34
23	81
25	27
81	891
45	28448
660	344
189	682