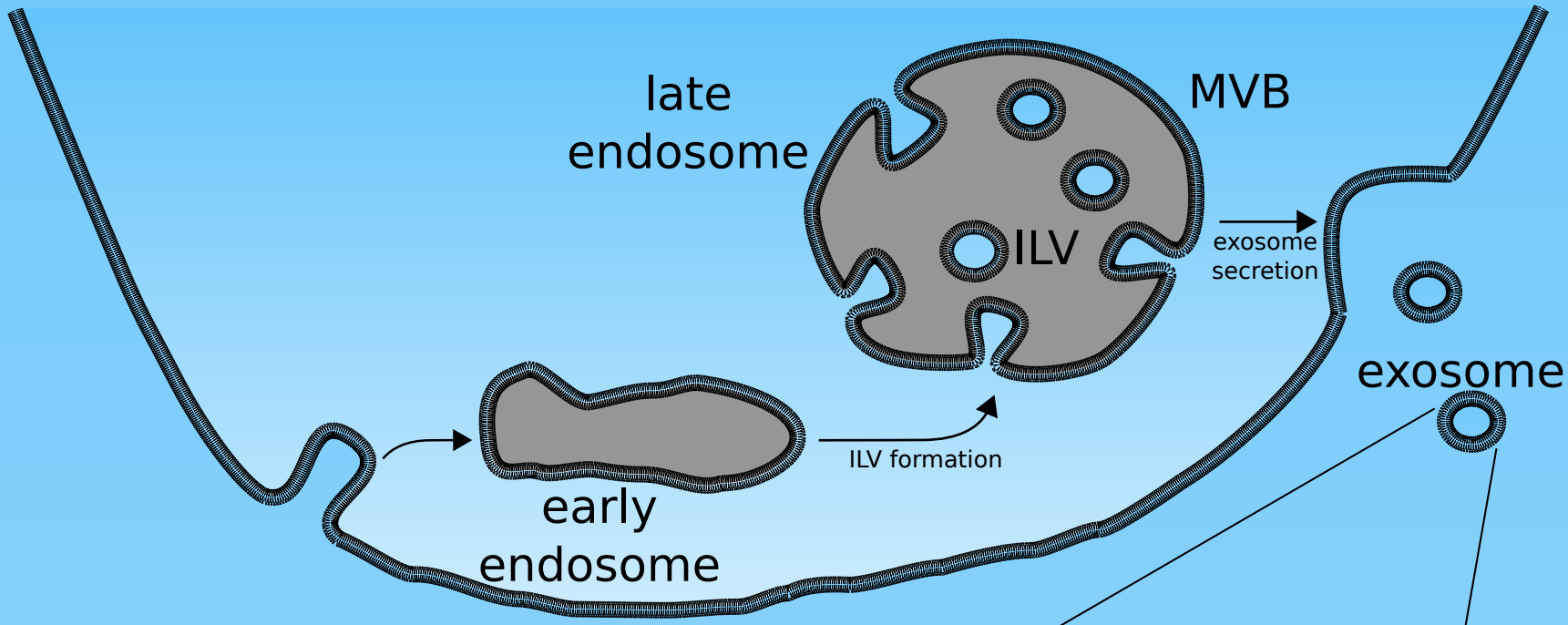
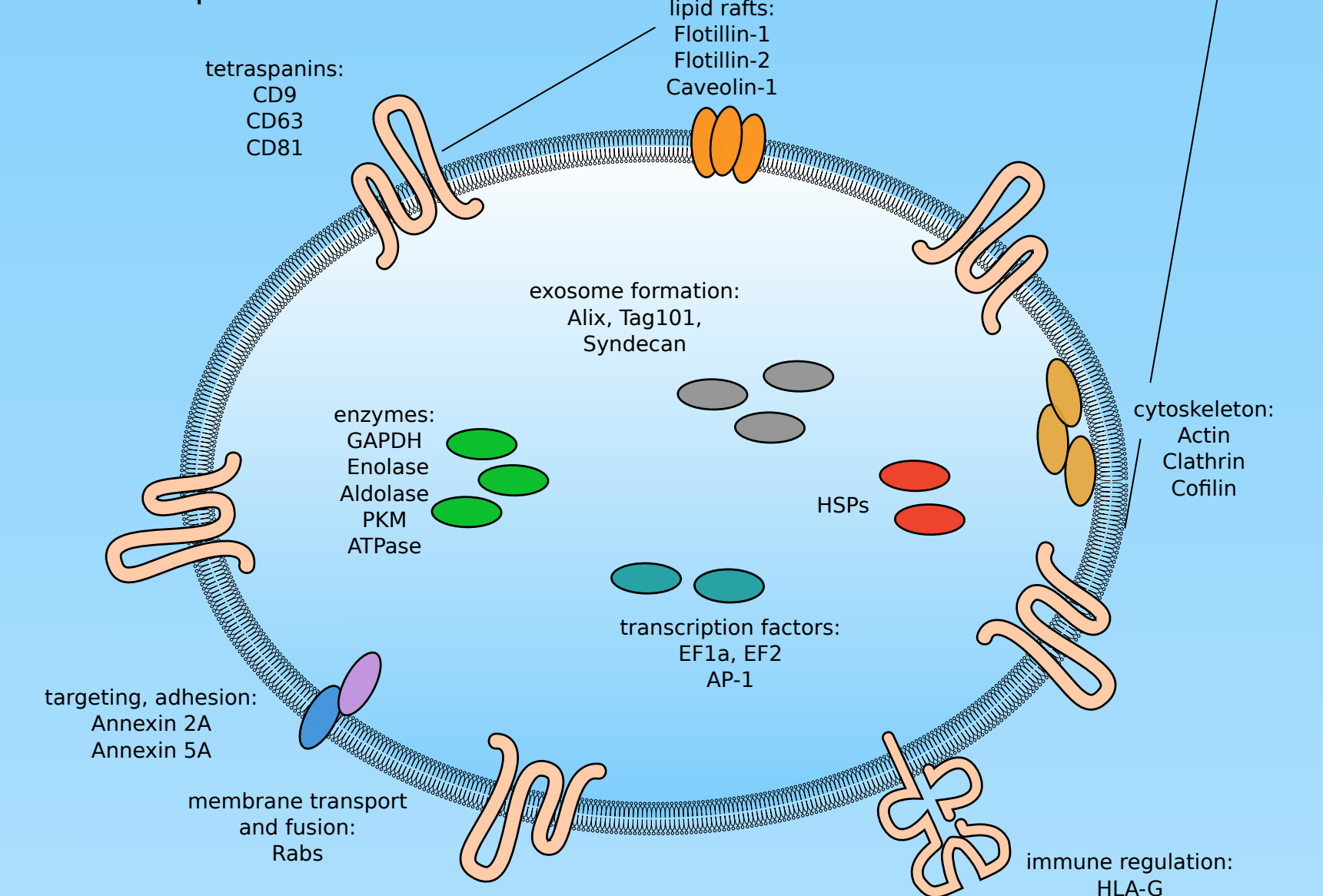


A. exosome biogenesis



B. exosome protein markers



Exosomes are small (50-120nm) endosome derived extracellular microvesicles (EMV) first observed in the early 1980s in the culture media of reticulocytes. They are produced in inward budding multivesicular bodies (MVBs). The resulting intra-luminal vesicles (ILV) are then released through exocytosis into the extracellular media. Based on this observation the term “exosomes” was coined for such vesicles. They share similar topology to the plasma membrane and are released by virtually all cell types and have been confirmed in all bodily fluids (see Fig. A).

Typical marker proteins on the exosome surface are the tetraspanins CD9, CD63, and CD81. Due to their accessibility these proteins are well suited to visualize and purify exosomes from biological samples. Furthermore, exosomes are enriched in components of the endosomal sorting complex required for transport (ESCRT) such as TSG101 and Alix, cytoskeletal proteins, and integrins and annexins that play a role in cell targeting and adhesion (see Fig. B).

Secretion of exosomes occurs in a constitutive manner although it is modulated by cellular stress or activation. They are considered as an unconventional secretory pathway for a vast array of proteins and a specific repertoire of nucleic acids in the form of mRNAs and small non-coding RNAs, including microRNAs. Exosomes are involved in processes such as cell-to-cell communication, transfer of genetic information, serve as vectors in various forms of cancer, and have been shown to be exploited by viruses to transfer molecules of pathogenic origin. Because their molecular composition is reflective of physiological or pathophysiological changes in their cell or tissue of origin, exosomes have significant potential as biomarkers for disease diagnosis.

antibodies-online offers a comprehensive range of products for exosome purification, quantification, and the extraction of exosomal RNA and DNA from human biological fluids or cell media. Besides, we have a comprehensive selection of antibodies directed against known exosome proteins.

(1) <http://www.ncbi.nlm.nih.gov/pubmed/15826944>
(2) <http://www.ncbi.nlm.nih.gov/pubmed/25695100>
(3) <http://www.ncbi.nlm.nih.gov/pubmed/24391718>
(4) <http://www.ncbi.nlm.nih.gov/pubmed/16651434>
(5) <http://www.ncbi.nlm.nih.gov/pubmed/26692841>
(6) <http://www.ncbi.nlm.nih.gov/pubmed/22807456>
(7) <http://www.ncbi.nlm.nih.gov/pubmed/21737841>

(8) <http://www.ncbi.nlm.nih.gov/pubmed/19619303>
(9) <http://www.ncbi.nlm.nih.gov/pubmed/23653359>
(10) <http://www.ncbi.nlm.nih.gov/pubmed/19381331>
(11) <http://www.ncbi.nlm.nih.gov/pubmed/25278937>
(12) <http://www.ncbi.nlm.nih.gov/pubmed/26524530>
(13) <http://www.ncbi.nlm.nih.gov/pubmed/22807456>
(14) <http://www.ncbi.nlm.nih.gov/pubmed/22355327>

antikoerper-online.de
antibodies-online GmbH
Schloss-Rahe-Str. 15
52072 Aachen
Germany
Phone +49 241 95163153
Fax +49 241 95163155

antibodies-online.com
antibodies-online Inc.
11 Dunwoody Park, Suite 145
Atlanta, GA 30338
USA
Phone +1 877 302 8632
Fax +1 888 205 9894

anticorps-enligne.fr
antibodies-online GmbH
57 rue d'Amsterdam
Paris 75008
France
Phone +33.1.76.63.32.65
Fax +33.1.74.18.08.22

antibodies-online.com
antibodies-online GmbH
Schloss-Rahe-Str. 15
52072 Aachen
Germany
Phone +44 20 3371 9695
Fax +44 20 3014 9489

Protein	Gene	GeneID	Uniprot	Ref	exocarta	TS	EF	LP	TA	CA	AG	MT	AP	HS	EN	RG	II	VI	ND	ABO products
					Top 100 Proteins															
14-3-3 protein epsilon	YWHAE	7531	P62258	-	22															www.antibodies-online.com/tiny/98477573
14-3-3 protein zeta/delta	YWHAZ	7534	P63104	-	15															www.antibodies-online.com/tiny/c78c2547
78 kDa glucose-regulated protein	HSPA5	3309	P11021	(1)	35															www.antibodies-online.com/tiny/a4562b63
Actin, cytoplasmic 1	ACTB	60	P60709	-	5															www.antibodies-online.com/tiny/a3178b13
ADAM10	ADAM10	102	O14672	(2)	-															www.antibodies-online.com/tiny/11486cc2
Alix	PDCD6IP	10015	Q8WUM4	(3)	2															www.antibodies-online.com/tiny/d6d271db
Alpha-Enolase	ENO1	2023	P06733	(4)	9															www.antibodies-online.com/tiny/041a0527
Alpha-Synuclein	SNCA	6622	P37840	(32)	-															www.antibodies-online.com/tiny/b9efd17e
Aminopeptidase N	ANPEP	290	P15144	-	-															www.antibodies-online.com/tiny/370c5533
Beta-amyloid 42	APP	351	P05067	(5)	-															www.antibodies-online.com/tiny/2eafc3cf
Annexin 5A	ANXA5	308	P08758	(6)	20															www.antibodies-online.com/tiny/f909b4c6
Annexin A2	ANXA2	302	P07355	(7)	6															www.antibodies-online.com/tiny/1ce312fa
AP-1	JUN	3725	P05412	-	-															www.antibodies-online.com/tiny/62c5f2cd
ATP citrate lyase	ACLY	47	P53396	-	72															www.antibodies-online.com/tiny/1cf0cc5c
ATPase	ATP1A1	476	P05023	-	39															www.antibodies-online.com/tiny/68ab47af
Basigin	BSG	682	P35613	(8)	-															www.antibodies-online.com/tiny/ea1526f6
Caveolin-1	CAV1	857	Q03135	(9)(10)	-															www.antibodies-online.com/tiny/e374ea6e
CD9	CD9	928	P21926	(11)	1															www.antibodies-online.com/tiny/d43d474a
CD11a	ITGAL	3683	P20701	(12)	-															www.antibodies-online.com/tiny/d59c4f9a
CD11b	ITGAX	3687	P11215	(12)	-															www.antibodies-online.com/tiny/797307cd
CD11c	ITGAM	3684	P20702	(12)	-															www.antibodies-online.com/tiny/817688f1
CD29	ITGB1	3688	P05556	(12)	34															www.antibodies-online.com/tiny/b7b45a83
CD37	CD37	951	P11049	(11)	-															www.antibodies-online.com/tiny/9b1577cb
CD44	CD44	960	P16070	(13)	-															www.antibodies-online.com/tiny/5c171b12
CD49f	ITGA6	3655	P23229	(12)	89															www.antibodies-online.com/tiny/e321e49b
CD63	CD63	967	P08962	(10)(11)	7															www.antibodies-online.com/tiny/a4ce7d6a
CD81	CD81	975	P60033	(14)	24															www.antibodies-online.com/tiny/8e9714cd
CD82	CD82	3732	P27701	(11)	-															www.antibodies-online.com/tiny/edd51f29
CD142	TF	2152	P13726	(15)	-															www.antibodies-online.com/tiny/adc926e3
CD146	MCAM	4162	P43121	(15)	-															www.antibodies-online.com/tiny/b03c5861
CD163	CD163	9332	Q86VB7	(15)	-															www.antibodies-online.com/tiny/e37dc2a0
Clathrin heavy chain 1	CLTC	1213	Q00610	-	23															www.antibodies-online.com/tiny/5e75e893
Claudin-1	CLDN1	9076	Q95832	(8)	-															www.antibodies-online.com/tiny/98a6df69
Cofilin-1	CFL1	1072	P23528	-	25															www.antibodies-online.com/tiny/46a2fda9
EBV LMP1	-	-	-	(16)	-															www.antibodies-online.com/tiny/79257dc4
EBV LMP2A	-	-	-	(16)	-															www.antibodies-online.com/tiny/8158625d
EF-1-alpha-1	EEF1A1	1915	P68104	(4)	14															www.antibodies-online.com/tiny/0edb0dcb
EF2	EEF2	1938	P13639	-	17															www.antibodies-online.com/tiny/a581303d
EGFR	EGFR	1956	P00533	(15)	-															www.antibodies-online.com/tiny/f37c47b8
Ep-CAM	EPCAM	4072	P16422	(17)(18)	-															www.antibodies-online.com/tiny/8921de80
Fatty acid synthase	FASN	2194	P49327	(3)	21															www.antibodies-online.com/tiny/f2484c34
Flotillin-1	FLOT1	10211	Q75955	(18)(19)	41															www.antibodies-online.com/tiny/b290d2a8
Flotillin-2	FLOT2	2319	Q14254	(19)	-															www.antibodies-online.com/tiny/eb4d2888
Fructose-bisphosphate aldolase A	ALDOA	226	P04075	-	18															www.antibodies-online.com/tiny/6e2ac68e
Glyceraldehyde-3-phosphate dehydrogenase	GAPDH	2597	P04406	-	4															www.antibodies-online.com/tiny/a2e66d15
HCV core protein	-	-	-	(20)	-															www.antibodies-online.com/tiny/6c53b8d4
Heat shock protein HSP 90-alpha	HSP90AA1	3320	P07900	(1)	10															www.antibodies-online.com/tiny/eab29dc5
Heat shock protein HSP 90-beta	HSP90AB1	3326	P08238	(1)	19															www.antibodies-online.com/tiny/2d15c468
Heparanase	HPSE	10855	Q9Y251	(21)	-															www.antibodies-online.com/tiny/73642385
HIV Gag	-	-	-	(20)	-															www.antibodies-online.com/tiny/4673e9ba
HIV Nef	-	-	-	(20)	-															www.antibodies-online.com/tiny/742ef15e
HLA-DRA	HLA-DRA	3122	P01903	(22)	-															www.antibodies-online.com/tiny/99ab39b4
HLA-G	HLA-G	3135	P17693	(23)	-															www.antibodies-online.com/tiny/d27430c1
Hsc70	HSPA8	3312	P11142	(1)	3															www.antibodies-online.com/tiny/45b4a004
HSV gB	-	-	-	(16)	-															www.antibodies-online.com/tiny/e9777069
HTLV-1 Tax	Tax	-	-	(20)	-															www.antibodies-online.com/tiny/7117d5ef
Huntingtin	HTT	3064	P42858	(5)	-															www.antibodies-online.com/tiny/f31cc1e9
ICAM-1	ICAM1	3383	P05362	(24)	-															www.antibodies-online.com/tiny/ad80e615
leucine-rich receptor kinase 2	LRRK2	120892	Q55007	(5)	-															www.antibodies-online.com/tiny/f7ad9068
L-lactate dehydrogenase A chain	LDHA	3939	P00338	-	13															www.antibodies-online.com/tiny/a025836a
Lysosome-associated membrane glycoprotein 1	LAMP1	3916	P11279	(25)	-															www.antibodies-online.com/tiny/486d62b1
Lysosome-associated membrane glycoprotein 2	LAMP2	3920	P13473	(23)	88															www.antibodies-online.com/tiny/8bcdd2a1
MHCI	-	-	-	(26)	-															www.antibodies-online.com/tiny/ca24e9ac
MHCII	-	-	-	(26)	-															www.antibodies-online.com/tiny/2bc3c026
MUC1	MUC1	4582	P15941	(15)	-															www.antibodies-online.com/tiny/98c1f5e9
N-cadherin	CDH2	1000	P19022	(15)	-															www.antibodies-online.com/tiny/8da93a7e
Phosphoglycerate kinase 1	PGK1	5230	P00558	(4)	16															www.antibodies-online.com/tiny/dbee47b4
Alkaline Phosphatase, placental	ALPP	250	P05187	(15)	-															www.antibodies-online.com/tiny/2391156a
prion proteins	-	-	-	(5)	-															www.antibodies-online.com/tiny/3ebff4d4
prostate-specific antigen	KLK3	354	P07288	(27)	-															www.antibodies-online.com/tiny/ef45c852
Pyruvate kinase PKM	PKM	5315	P14618	(28)	12															www.antibodies-online.com/tiny/9be38334
Rab-14	RAB14	51552	P61106	-	75															www.antibodies-online.com/tiny/42bd7b46
Rab-5a	RAB5A	5868	P20339	-	80															www.antibodies-online.com/tiny/8a882114
Rab-5b	RAB5B	5869	P61020	-	86															www.antibodies-online.com/tiny/1eda77c4
Rab-5c	RAB5C	5878	P51148	-	64															www.antibodies-online.com/tiny/8b28a0ed
Rab-7	RAB7A	7879	P51149	-	61															www.antibodies-online.com/tiny/88f0397a
Rap 1B	RAP1B	5908	P61224	-	33															www.antibodies-online.com/tiny/6599f5