EV-METRIC

EV-TRACK: transparent reporting and centralizing knowledge in extracellular vesicle research

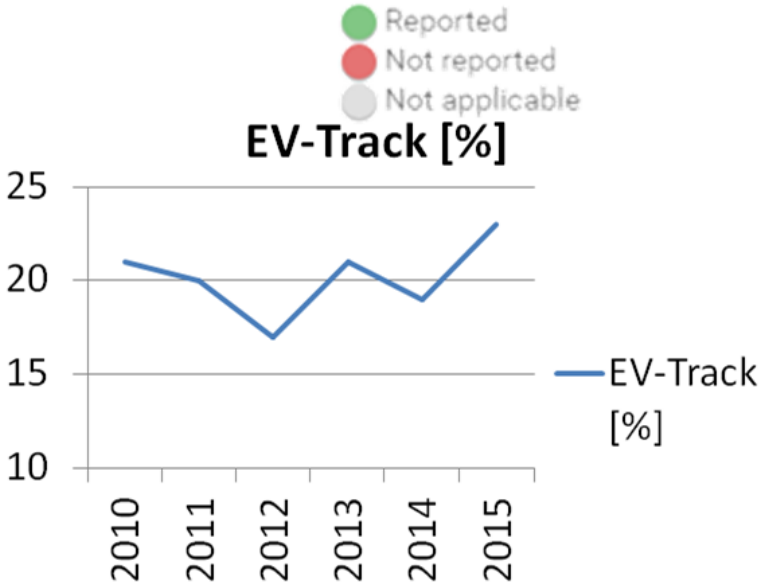
EV-TRACK Consortium*

We argue that the field of extracellular vesicle (EV) biology needs more transparent reporting to facilitate interpretation and replication of experiments. To achieve this, we describe EV-TRACK, a crowdsourcing knowledgebase (http://evtrack.org) that centralizes EV biology and methodology with the goal of stimulating authors, reviewers, editors and funders to put experimental guidelines into practice.

2017. 03 .06

Seev.teamwork.com

EV-METRIC



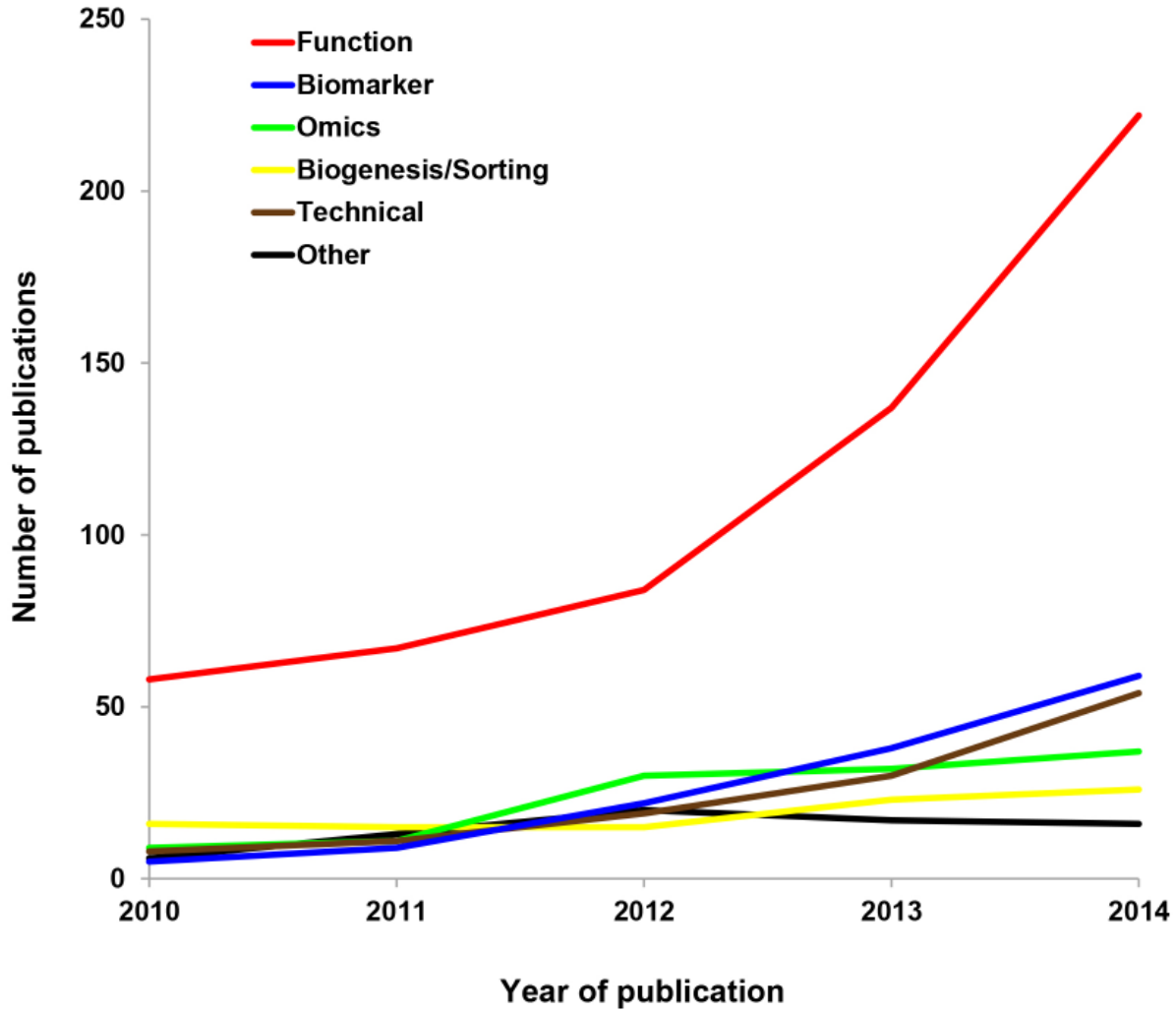
All experiments on the same sample type

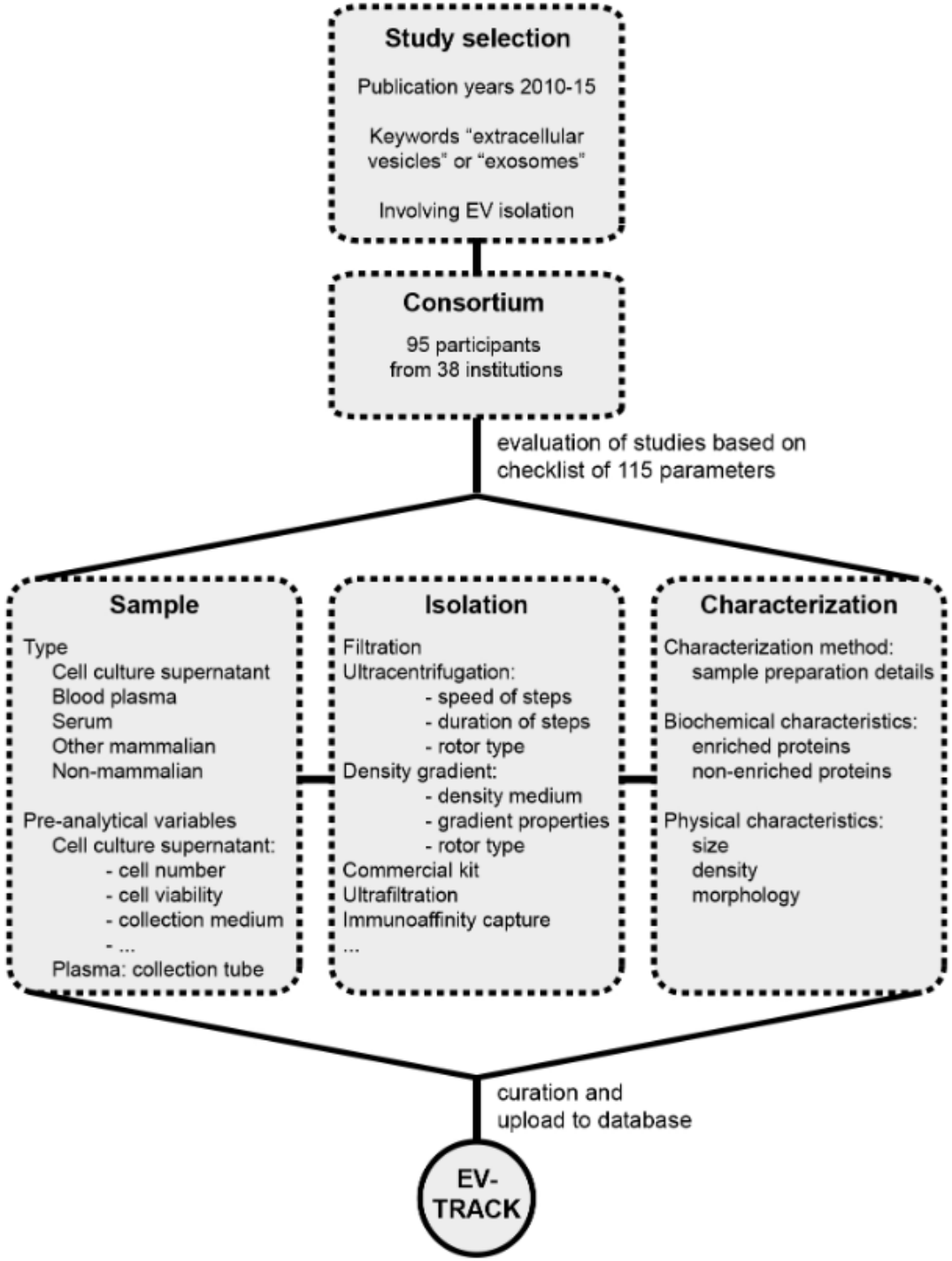
- EV-enriched proteins
- Non EV-enriched protein
- Qualitative and quantitative analysis
- Electron microscopy images
- Density gradient
- EV density
- Ultracentrifugation specifics
- Antibody specifics
- Lysate preparation

Legnagyobb EV track pontszámú cikk:

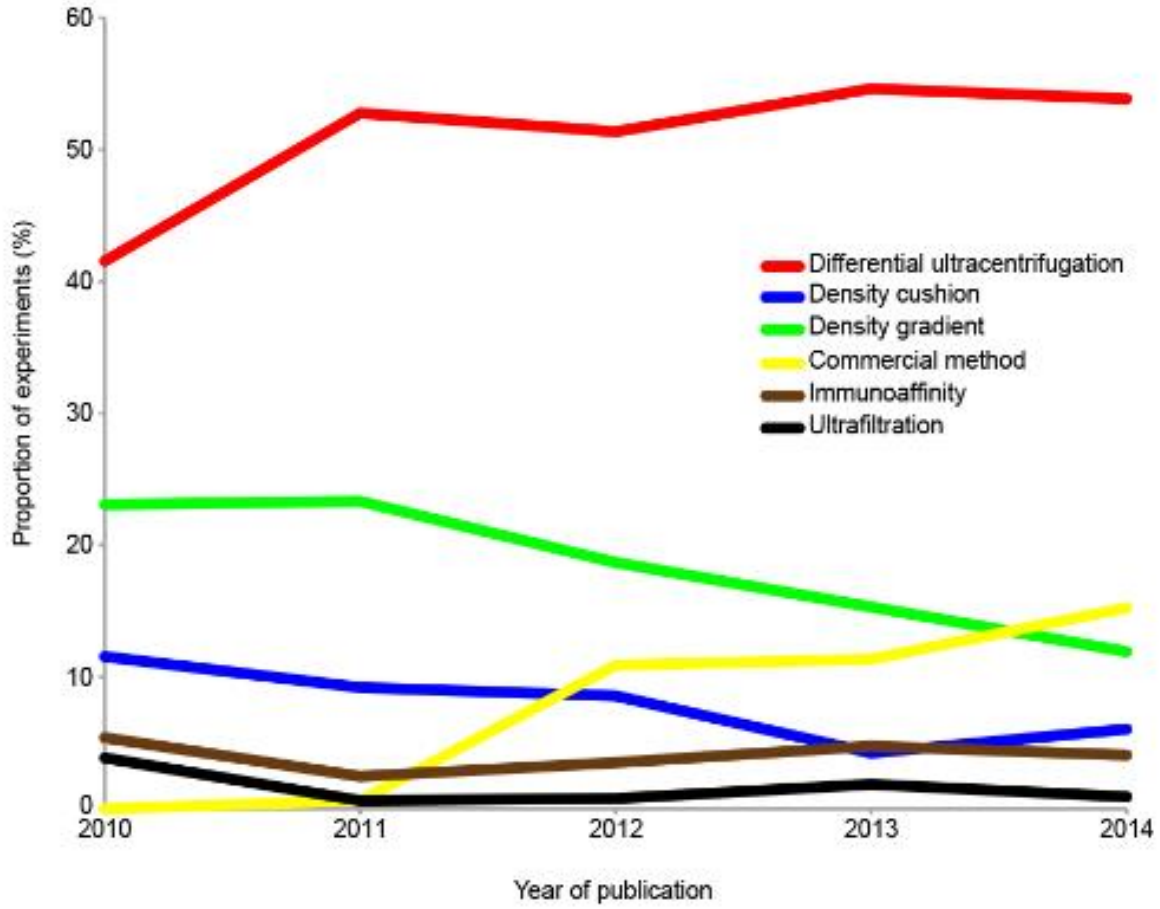
Details	EV-TRACK ID	Experiment nr.	Species	Sample type	Isolation protocol	First author	Year	EV-METRIC
+	EV140001	2/4	Homo sapiens	Cell culture supernatant	UF Iodixanol-DG 0.45 µm 0.2 µm filter	Van Deun J	2014	88%

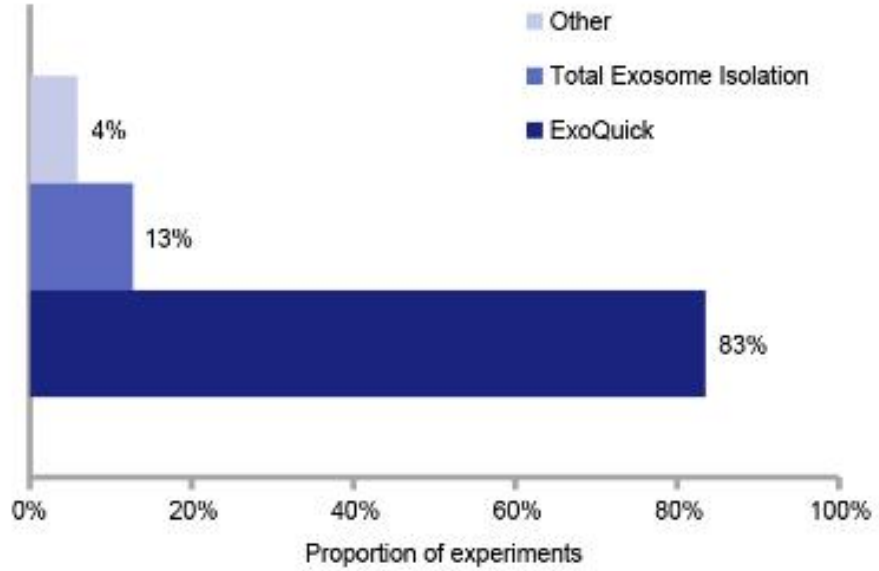
EV tanulmányok célkitűzései



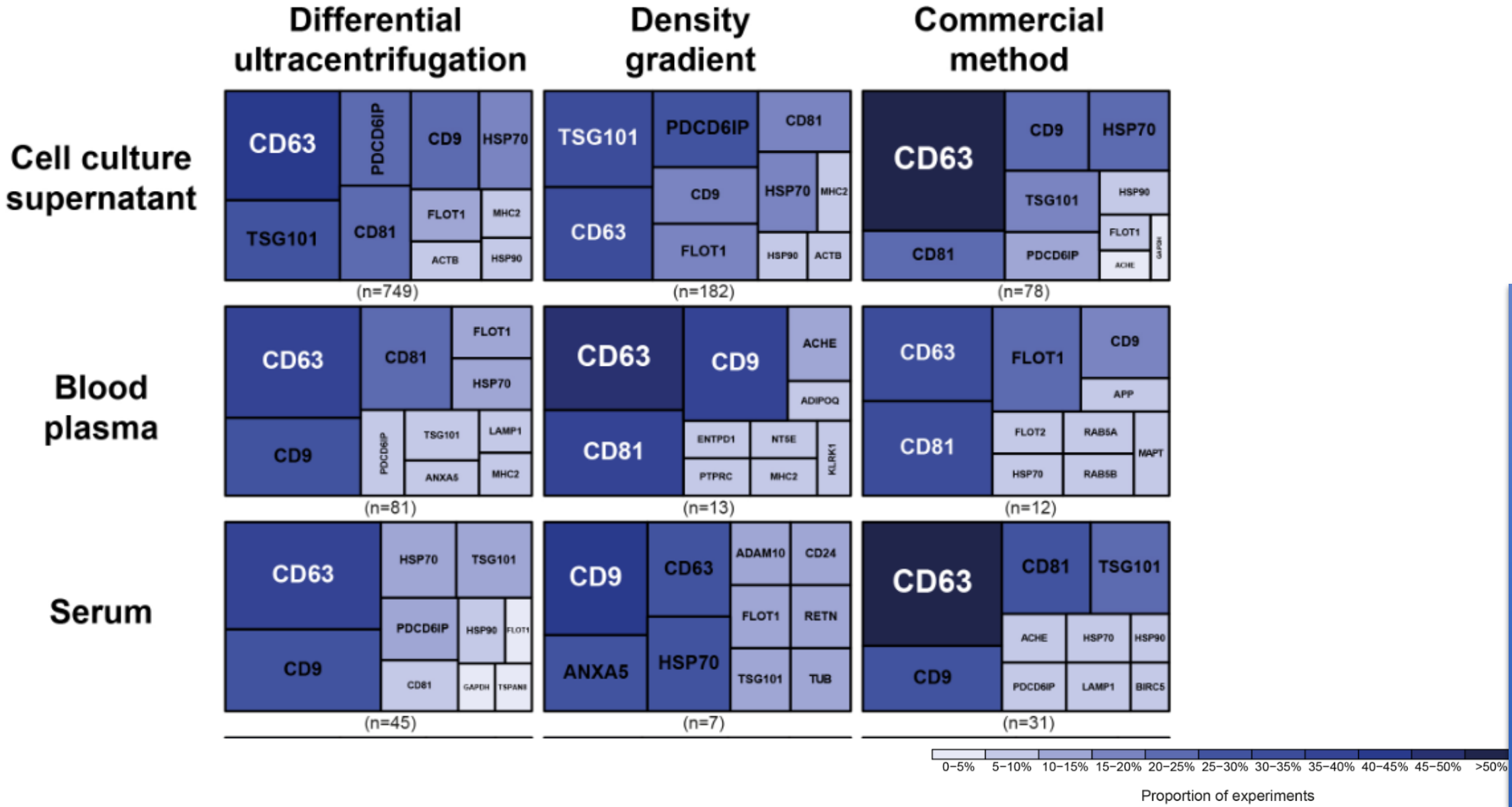

Study selection
Publication years 2010-15
Keywords "extracellular vesicles" or "exosomes"
Involving EV isolation
Consortium
95 participants
from 38 institutions
evaluation of studies based on checklist of 115 parameters
Sample
Type
Cell culture supernatant
Blood plasma
Serum
Other mammalian
Non-mammalian
Pre-analytical variables
Cell culture supernatant:
- cell number
- cell viability
- collection medium
- ...
Plasma: collection tube
Isolation
Filtration
Ultracentrifugation:
- speed of steps
- duration of steps
- rotor type
Density gradient:
- density medium
- gradient properties
- rotor type
Commercial kit
Ultrafiltration
Immunoaffinity capture
...
Characterization
Characterization method:
sample preparation details
Biochemical characteristics:
enriched proteins
non-enriched proteins
Physical characteristics:
size
density
morphology
curation and upload to database
EV-TRACK

EV izolálási módszerek





EV izolálási módszerek és jellegzetes EV markerek



EV jellemzési módszerek

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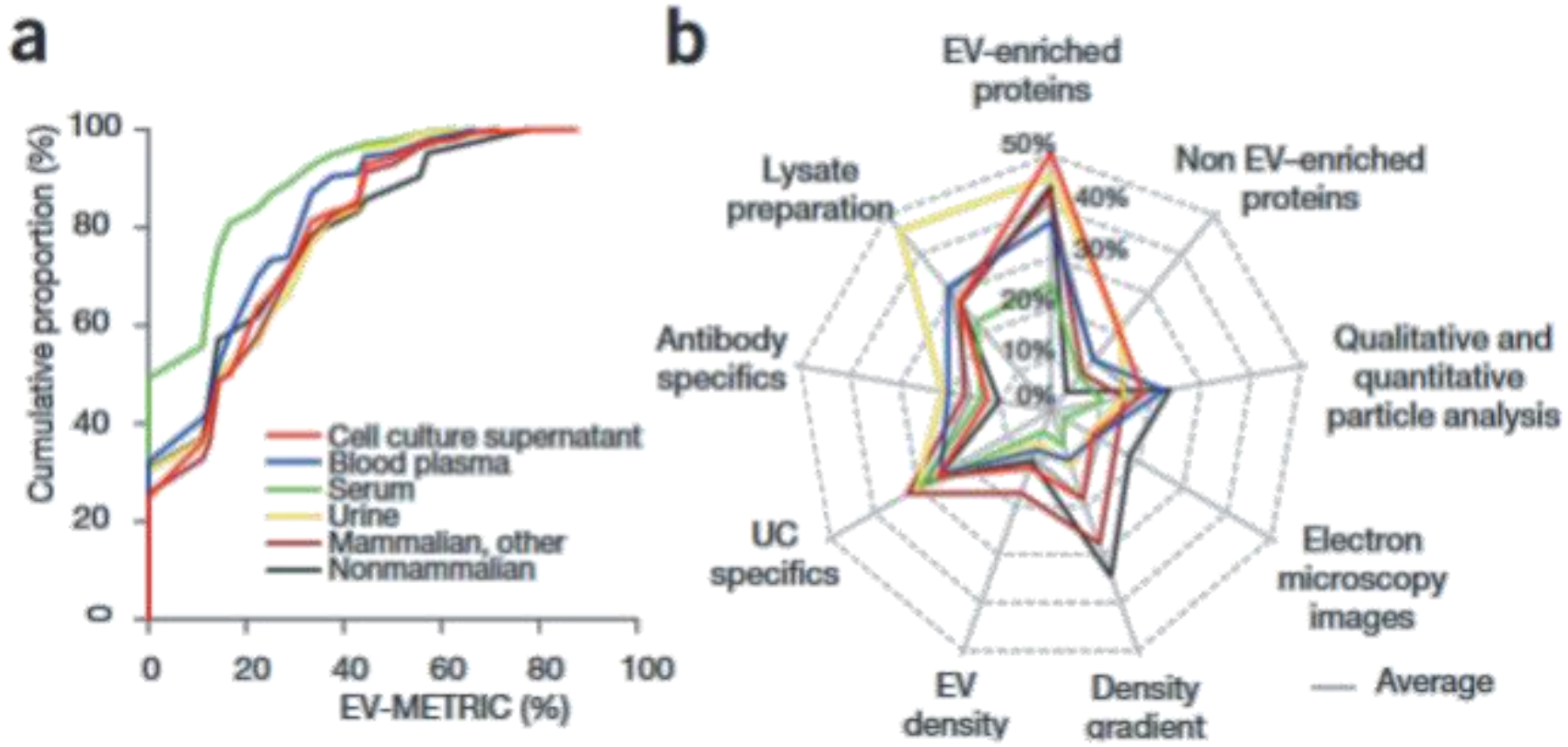
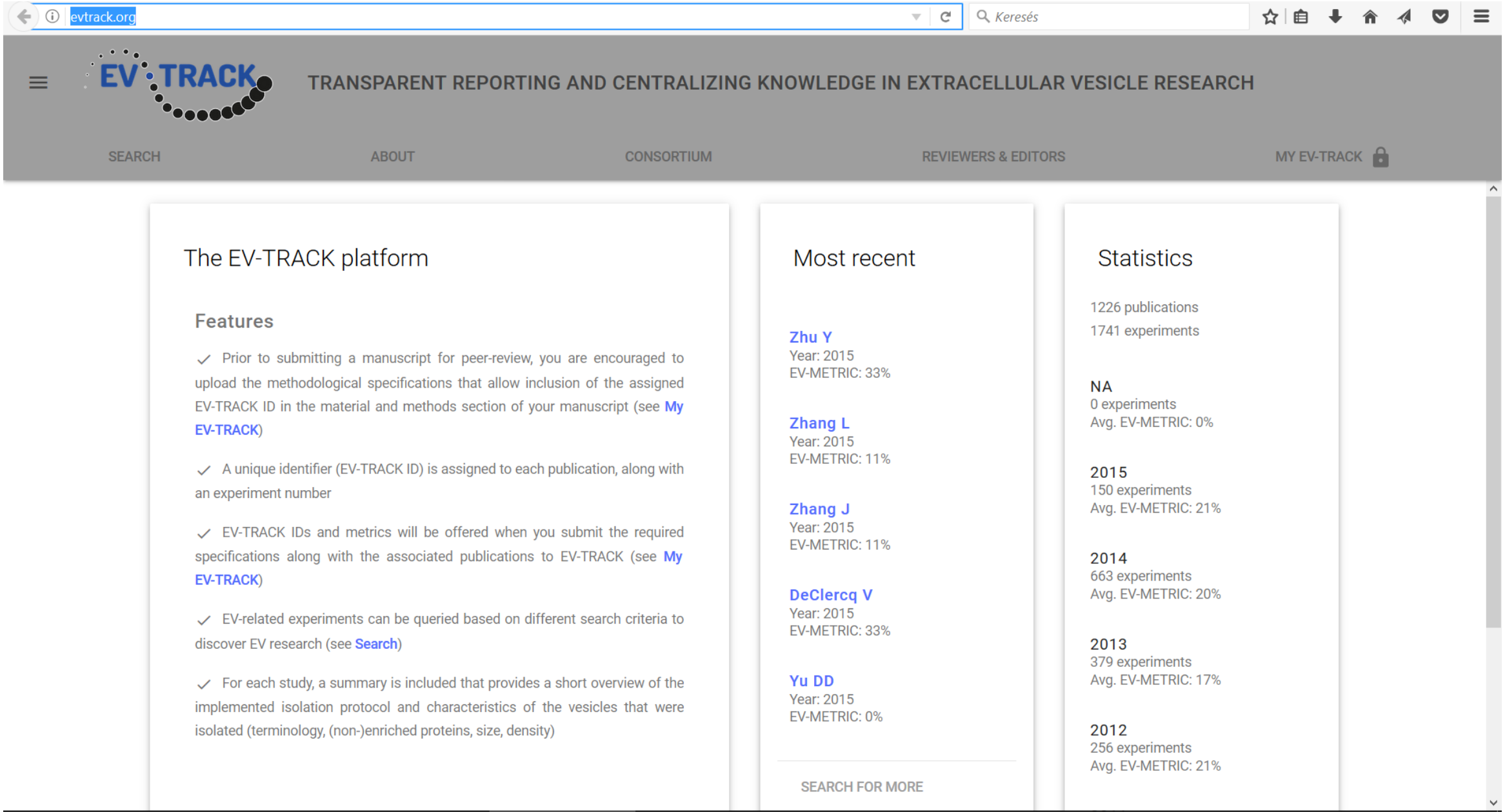


www.evtrack.org



1,742 experiments that are recorded in EV-TRACK report 190 unique isolation methods and 1,038 unique protocols to retrieve EVs from biofluids

	EV-TRACK ID	protein analysis: EV enriched	protein analysis: non EV-enriched	complementary particle analysis	electron microscopy images	density gradient	vesicle density	UC specifics	antibody specifics	lysis buffer	Score
2	EV120025	0	0	0	0	0	0	1	1	0	22%
3	EV120025	1	0	1	0	1	1	NA	1	0	63%
4	EV120025	0	0	0	0	1	1	NA	1	0	38%
5	EV140292	1	0	0	0	0	0	1	0	0	22%
6	EV140292	1	0	0	0	0	0	1	0	0	22%
7	EV130156	0	0	0	0	0	0	0	NA	NA	0%
8	EV140055	1	0	0	0	0	0	0	0	1	22%
9	EV140019	0	0	0	1	0	0	0	1	1	33%
10	EV130077	0	0	0	0	0	0	0	0	0	0%
11	EV130077	1	0	0	0	1	0	NA	0	0	25%
12	EV110030	1	0	0	0	0	0	1	0	0	22%
13	EV140293	1	0	0	0	0	0	0	0	0	11%
14	EV140020	0	0	0	1	0	0	1	1	1	44%
15	EV110082	0	0	0	0	0	0	0	0	0	0%
16	EV130006	0	0	0	1	0	0	1	1	1	44%
17	EV130157	0	0	0	0	0	0	NA	0	0	0%
18	EV130157	0	0	0	0	0	0	0	NA	NA	0%
19	EV140294	0	0	0	0	0	0	NA	0	0	0%
20	EV140295	0	0	0	0	0	0	NA	NA	NA	0%
21	EV100071	1	0	0	0	0	0	0	NA	NA	14%
22	EV120113	0	0	0	0	0	0	0	NA	NA	0%
23	EV110031	0	0	0	0	0	0	0	0	1	11%
24	EV120010	1	0	0	0	0	0	NA	1	1	38%
25	EV120010	1	0	0	0	0	0	0	1	1	33%
26	EV120010	1	0	0	0	0	0	1	1	1	44%
27	EV120010	1	0	0	0	0	0	NA	1	1	38%
28	EV120010	1	0	0	0	0	0	NA	1	1	38%
29	EV120010	1	0	0	0	0	0	1	1	1	44%
30	EV130158	0	0	0	0	0	0	0	0	0	0%
31	EV110012	1	0	1	0	0	0	0	0	0	22%
32	EV110032	0	0	1	0	0	0	0	0	0	11%

Blad1 Blad2 Blad3

EV Track pontozási rendszer (1)

1. Study	
Study number	Specify
First author	Specify
Year of publication	Specify
Number of citations	Specify
2. Journal	
Name	Specify
Impact factor from year of publication	Specify
3. Title	
Exosomes	0 or 1
Microvesicles	0 or 1
Microparticles	0 or 1
Extracellular vesicles	0 or 1
Other vesicle-related term, e.g. Prostasome, ...	NA
4. Keywords	
Are keywords available?	0 or 1
Exosomes	0 or 1
Microvesicles	0 or 1
Microparticles	0 or 1
Extracellular vesicles	0 or 1
Other vesicle-related term, e.g. Prostasome, ...	NA
5. Study aim	
Choose from **drop-down list**	-Select-
If "other" was selected: specify	NA
6. Sample	
Cell culture supernatant	0 or 1
Serum-free medium	0 or 1
EV-depleted serum containing medium	0 or 1
How was the serum depleted of EVs?	NA
Serum EV depletion protocol	0 or 1
Cell viability	0 or 1
Specification of cell number?	0 or 1
Blood plasma	0 or 1
Collection Tube: EDTA	0 or 1
Collection Tube: Citrate	0 or 1
Collection tube: other	NA
*If necessary: select other biofluid from **drop-down list***	NA
If "other" was selected: specify	NA
7. Isolation method	
(Differential) (ultra)centrifugation	0 or 1
Density gradient	0 or 1
Commercial	0 or 1
If commercial: specify	Specify
Microfluidics	0 or 1
Other	0 or 1
If other: specify	Specify
Company	NA
Academic: own group or third party paper	NA
If academic reference: specify	NA
Number of papers to get protocol	Specify
Pre-processing of sample by filtration	0 or 1
0.8 µm	0 or 1
0.45 µm	0 or 1
0.2 or 0.22 µm	0 or 1
0.1 µm	0 or 1
Differential (ultra)centrifugation	
<= 500 g	0 or 1
> 500 g AND < 10,000 g	0 or 1
>= 10,000 g AND < 50,000 g	0 or 1
>= 50,000 g AND < 100,000 g	0 or 1
>= 100,000 g AND < 150,000 g	0 or 1
>= 150,000 g	0 or 1
Duration of final pelleting (before washing step) (min)	Specify
Rotor type	Specify
Swinging bucket or fixed angle rotor?	NA

EV Track pontozási rendszer (2)

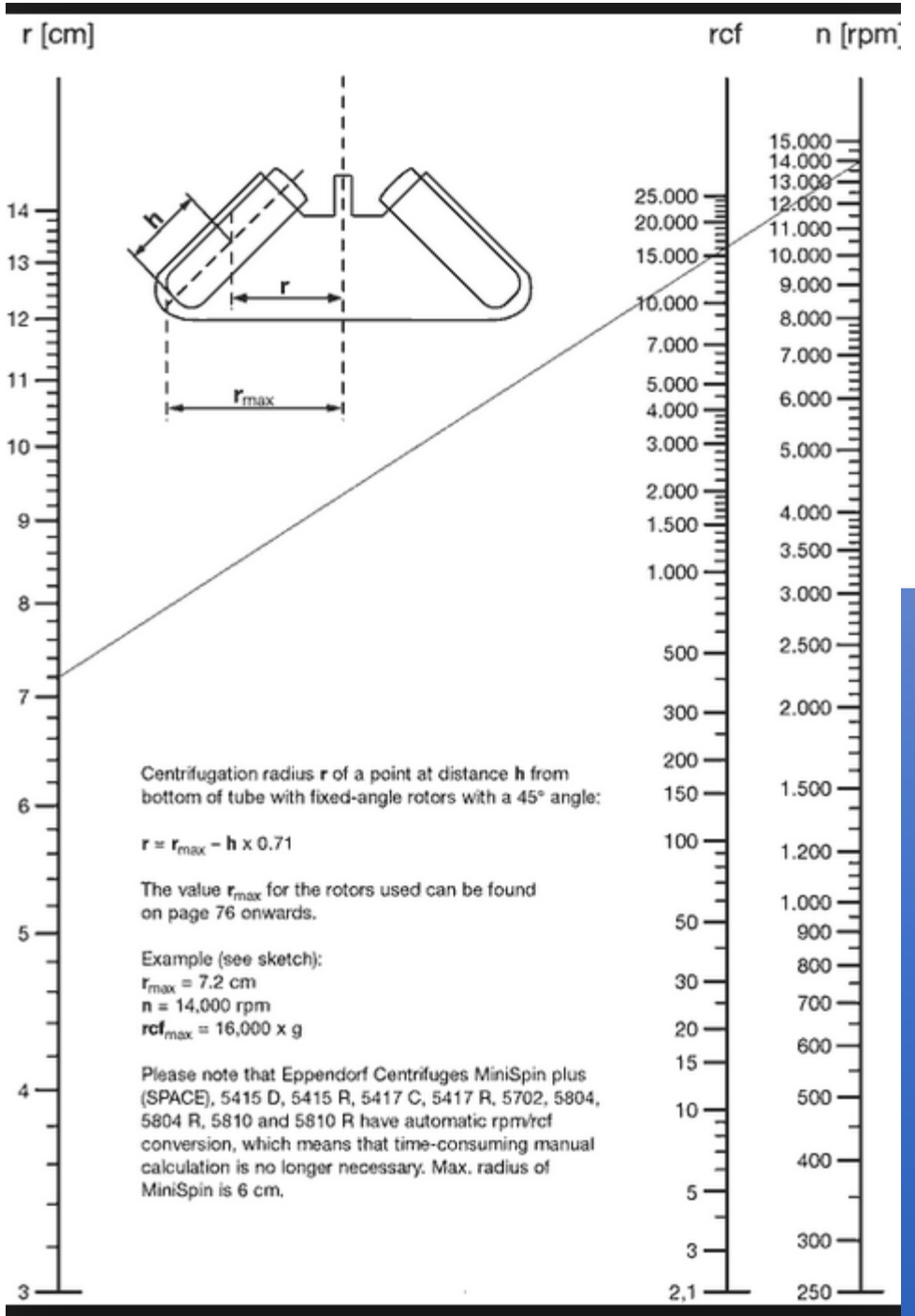
Adjusted K-factor	Specify
Wash step included after first-time pelleting?	0 or 1
Wash step volume	Specify
Rotor type for wash step centrifugation	Specify
Adjusted K-factor for wash step centrifugation	Specify
Density gradient centrifugation	
Only as validation/ selected experiments?	0 or 1
Type: choose from **drop-down list**	NA
Lowest percentage/molarity (upper layer)	Specify
Highest percentage/molarity (lower layer)	Specify
Top-down or bottom-up gradient	NA
Speed of fractions pelleting **(in g)**	Specify
Wash of fractions included	0 or 1
Volume of wash step	Specify
Rotor type for first-time fractions pelleting	Specify
Swinging bucket or fixed angle rotor?	NA
Adjusted k-factor	Specify
Vesicle density (g/mL)	Specify
Sucrose cushion	0 or 1
Only as validation/ selected experiments?	0 or 1
Ultrafiltration	0 or 1
Immuno-affinity capture (beads)	0 or 1
Only as validation/ selected experiments?	0 or 1
For which surface proteins was selected?	Specify
8. Characterisation	
Protein analysis	0 or 1
Western blot	0 or 1
ELISA	0 or 1
(antibody-coated) beads for flow cytometry	0 or 1
Proteomics	0 or 1
EV enriched proteins	
Alix	0 or 1
CD63	0 or 1
CD81	0 or 1
CD9	0 or 1
Flotillin-1	0 or 1
HSP90	0 or 1

HSP70	0 or 1
Syntenin	0 or 1
TSG101	0 or 1
Other	NA
Total number of EV-enriched proteins checked	Specify
Non-EV enriched proteins	
Cell organelle protein	0 or 1
Albumin	0 or 1
Uromodulin	0 or 1
Other	NA
Antibodies	
Catalogue number/clone specified?	0 or 1
Dilution factor of antibodies specified?	0 or 1
Sample lysate conditions specified?	0 or 1
EV database used for characterization?	0 or 1
Data submitted to database?	0, 1 or NS
Particle analysis (Size and number)	
Dynamic light scattering	0 or 1
High resolution flow cytometry	0 or 1
Nanoparticle tracking analysis	0 or 1
Tunable resistive pulse sensing	0 or 1
Other	NA
Microscopy	
Performed?	0 or 1
Transmission electron microscopy (no immuno)	0 or 1
Immuno-electron microscopy	0 or 1
If immuno: protein marker(s) used	Specify
Cryo-electron microscopy	0 or 1
Scanning electron microscopy	0 or 1
Atomic force microscopy	0 or 1
Other	NA
Large field with multiple vesicles (>=5)	0 or 1
Close-up of single vesicles	0 or 1
Mean vesicle size (+-stdev)	Specify
Remarks (optional)	Specify

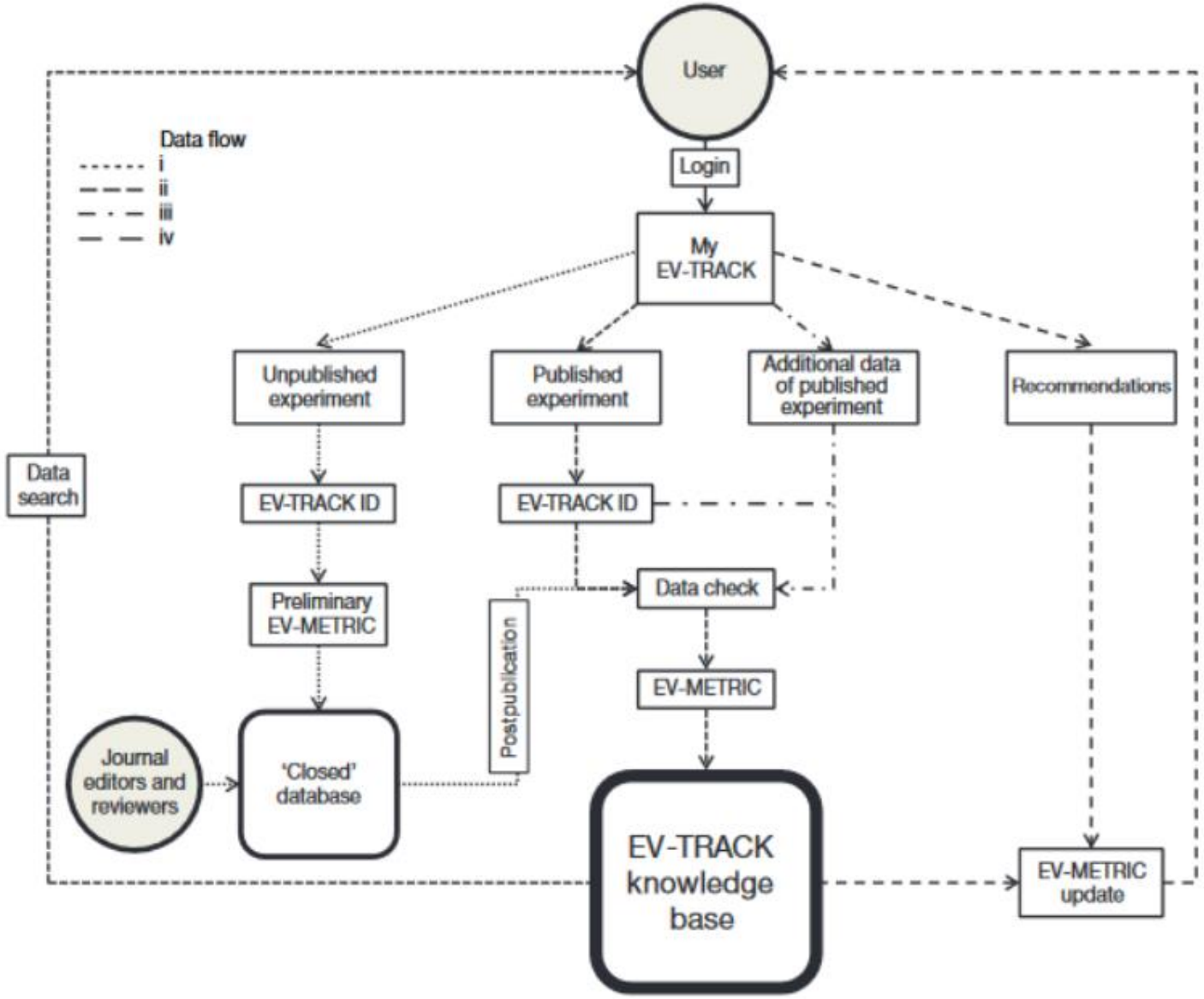
k-faktor

The k-factor or clearance factor of a rotor is a measure of the pelleting efficiency of a rotor
that runs at its maximum velocity and is calculated by the equation:
k = (2.53*105*ln(rmax/rmin))/(RPM/100)2

If a rotor is run below its maximum velocity, the following equation should be used to calculate the adjusted k-factor:
k adj = k*(max RPM/actual RPM)2
(RPM: revolutions per minute; rmax/rmin: maximum/minimum distance from the rotational
axis).



EV TRACK működési algoritmusa



Köszönöm szépen a figyelmet!