ANA Futura information meeting

Karolinska Institutet

5 December 2023

Agenda

- Welcome!
- Latest ANA Futura news – *Lars Frelin, facility manager*
- Development of impact support at External Engagement Office (EEO) - *Charlotta Lindquist, Impact Advisor*
- "Blood, Sweat and Tears – Aiming to understand biological nanoparticles for advancement of diagnostics and therapy" – *Research presentation from André Görgens, Labmed/BCM*
- Questions from the staff

Latest ANA Futura news

- New term of office in the steering- and drafting committee's
- Strategic work during 2024
- New research groups to ANA Futura
- Update regarding the new touch down seats and meeting areas
- Update from the ANA Futura service team

Facility manager

Lars Frelin
LabMed

New term of office in the steering- and drafting committee's 2024

- **Welcome – chair of the ANA Futura steering committee 2024**

- **Lars Henningsohn – Head of Department of Clinical Science, Intervention and Technology (Clintec)**

- Members of the steering- and drafting committee´s was decided on 7th November 2023

Strategic work during 2024

- **Principles for shared laboratories in ANA Futura**
- **Follow-up on relocations in ANA Futura**: need of various adjustments, storage, shared labs, service level, etc.
- **Scientific activities** (for example seminars, journal clubs etc)
- **Cooperation/collaboration with Neo:** deepened cooperation (staff, labs, routines, infrastructure, scientific activities)
- **Shared premises (not only lab):** review all shared premises for more efficient use/utilization
- **Maintenance and contingency plan**
- **Satisfaction survey (ANA Futura & Neo**): to be sent out fall 2024

- **Topics for the strategic work has been suggested by members of the steering- and drafting committee´s, individual initiatives, the service team, facility manager**

A warm welcome to the new research groups

- **Eight research groups** have relocated from Novum to ANA Futura (around 65 new staff)

Samir EL Andaloussi

Joel Nordin

Edvard Smith and Rula Zain-Luqman

Anthony Wright

Caroline Palm-Apergi

Rainer Heuchel, Clintec

Olav Rooijackers, Clintec

Weimin Ye, MEB

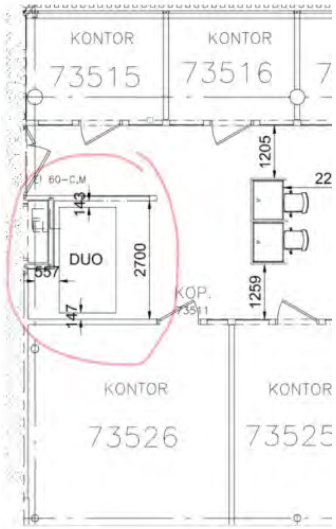
A big thank you to all staff that have been instrumental in making this relocation so smooth and on time!

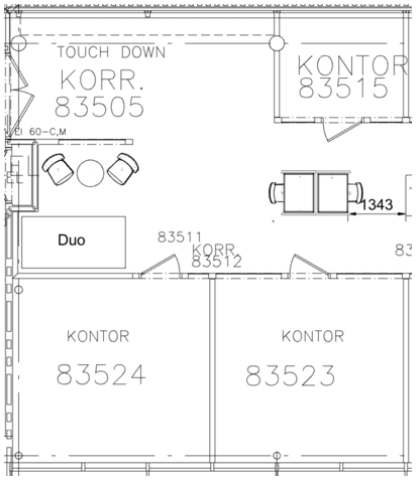
New touch down seats and meeting areas

- **The installation of touchdown seats and pods is ongoing**
  - → Pods have been installed
  - → Position of pods will be changed (see sketch)
  - → Touchdown seats will be installed from 5 December

- **What will be installed?**
  - → A total of 38 attractive touch down seats will be installed in the office building (extension building) on floor 7 and 8, and two pods for meetings

- **When will the installation be finalized?**
  - → Preliminary 8 December





Update from the Service team

Information regarding the ANA Futura service team during Christmas

- The ANA Futura service team is present every working day during the Christmas holidays
- No staff is available on days off / bank holidays

- Merry Christmas and a happy new year!

In case of emergency

Please contact the facility manager:

Lars Frelin lars.frelin@ki.se.

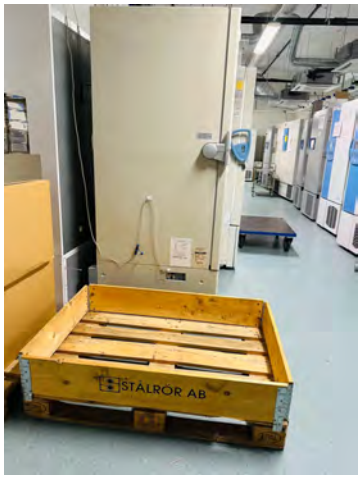
08-524 836 32.

070-424 3001 (for text messages).

Update from the Service team

Cleaning and organization of the freezer facility is needed

- The freezer facility needs to be better organized and less waste on the floor
- Racks belonging to a freezer should be placed on top of the freezer (not on the floor)
- Boxes can be stored separately in the freezer facility
- Racks/boxes that you want to discarded should be put on the wood pallet
- Deadline for organizing the racks/boxes is 7 January 2024, thereafter leftover material will be discarded. Information will be communicated by email to all staff



Update from the Service team

All you need is three phone numbers…

- ANA Futura service team: 08-524 836 41
- KI security guards: 08-524 860 60
- SOS Alarm: 112
- **Please record the phone numbers in both your work and private phone!** (if you have two separate)

Update from the Service team

- **Thank you for your service during 2023**

  - → Marjan Amiri
  - → Åsa Hedberg
  - → Maria Lunell
  - → Michael Davoren
  - → Tommy Eklund
  - → Staffan Kjellgren

Questions?

Facility manager

Lars Frelin
LabMed

”Development of impact support at External Engagement Office (EEO)”

Charlotta Lindquist

- **Speaker: Charlotta Lindquist,** Impact Advisor

- Presentation: **“Development of impact support”**

- Webpage: https://staff.ki.se/eeo-external-engagement-office

Impact support at EEO

Charlotta Lindquist, PhD
Impact advisor

RSO – Research Support Office

GO
Grants Office

GMO
Grants Management Office

CDO
Compliance & Data Office

EEO
External Engagement Office

https://staff.ki.se/eeo-external-engagement-office

Partnerships

We work to create new opportunities for KI researchers (including PhD students and postdocs) for partnerships with industry and other external organisations. We provide support in setting up and managing long-term structured partnerships.

Research contracts

We provide advice and support in the early stages of the contracting process for such partnerships.

Impact

We provide mentorship programmes, inspirational activities and support to help researchers achieve impact and use of their knowledge and how their research can address United Nations Agenda 2030.

Career service

We work to educate and advise PhD students, postdocs and researchers for a future career inside and outside academia. We organize a doctoral course and a financed internship program for PhD students and postdocs. We offer an extensive program of seminars, workshops, lectures and online support.

Impact – Utilization
What do we mean?

- **Impact** is defined as an **effect** on, change or benefit to the economy, society, culture, public policy or services, health, the environment or quality of life, **beyond academia**.

- Impact case stories: Impact case stories | Karolinska Institutet (ki.se)

Why is impact important ?

- Part of university tasks
- KI Strategy 2030

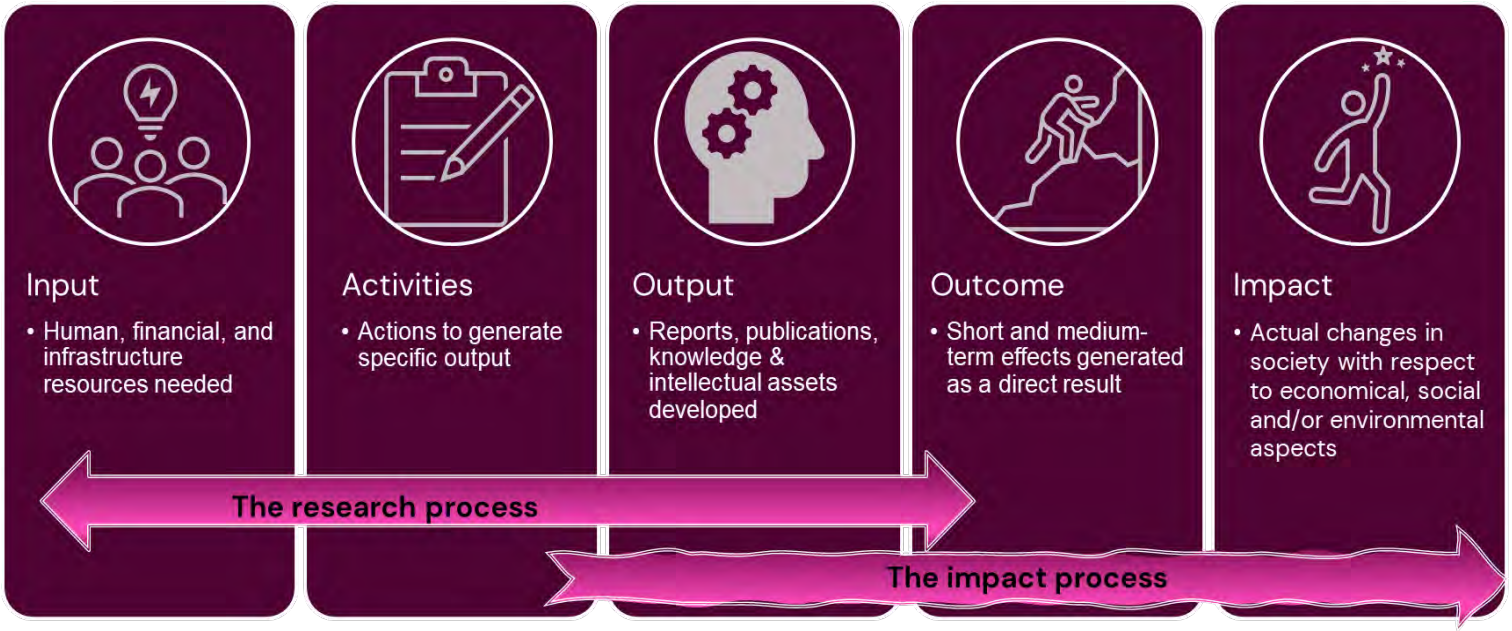
- Funders require that you describe the impact you want to achieve
- Demand from investors

- To benefit society

From research & knowledge to a healthier society – different pathways to create benefit

- Publication in peer-reviewed journals
- Popular science publications
- Interaction with the public to influence attitudes, perceptions, theories and norms
- Working with stakeholders and beneficiaries to influence policies, laws, standards and regulations.
- Collaboration / knowledge transfer (for example between individual

The journey – from research to impact



- Impact support in grant applications
- Workshops/ preparations
- IP vs. publication strategies
- Collaboration opportunities
- Intellectual Asset Management (IAM)

Professor's privilege

- Gives researchers and teachers at Swedish universities the right to their patentable results.

- The right to results/innovation can be transferred via agreement.

Definitions in Horizon Europe

Research Output

Results generated by the action to which access can be given in the form of scientific publications, data or other engineered outcomes and processes such as software, algorithms, protocols and electronic notebooks.

Outcomes

Expected effects, over the medium term, of projects supported under a given topic. The results of a project should contribute to these outcomes, fostered in particular by the dissemination and exploitation measures. Outcomes generally occur during or shortly after the end of the project.

Impacts

Wider long-term effects on society (including the environment), the economy and science, enabled by the outcomes of R&I investments (long term). Impacts generally occur some time after the end of the project.

Describing impact in EU applications

- Measures (how) to maximize expected outcomes and impacts in dissemination and exploitation plan.
- Contribution to expected scientific, societal and economic impacts.

- How? What? To whom? When?

  => *make a specific plan*.
- Make a story, a narrative!
- How will the project make a difference?
- Be concrete and in proportion to your project
- Make specific and detailed plans

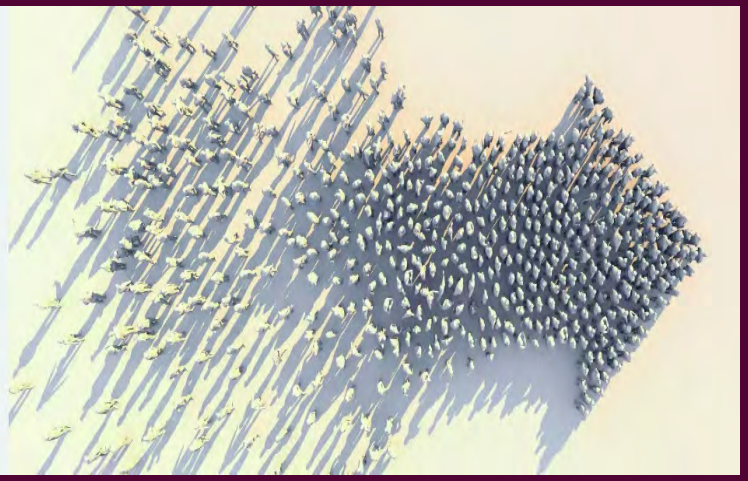
Support and guidance

- **Funding**
  - Support with impact in research funding applications
- **Idea protection**
  - Intellectual property rights advice and patenting/publication strategies
- **Collaboration**
  - Negotiation and agreement support
  - Finding relevant collaboration partners

Creating impact together

Every one of us can make a difference and together we can improve society and human health. Impact includes social, environmental, cultural or economic benefits from academic research and knowledge.

Research support - Impact



Impact contacts:
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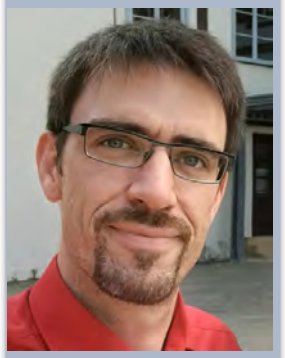
(IP)
kerstin.lundin@ki.se

THANK YOU

Questions?

- **Speaker: Charlotta Lindquist,** Impact Advisor
- Presentation: **“Development of impact support”**
- Webpage: https://staff.ki.se/eeo-external-engagement-office

“Blood, Sweat and Tears – Aiming to understand biological nanoparticles for advancement of diagnostics and therapy”



André Görgens

- **Speaker: André Görgens,** researcher, Labmed / BCM
- Presentation: **“Aiming to understand biological nanoparticles for advancement of diagnostics and therapy”**
- Webpage: https://ki.se/en/labmed/research-group-samir-el-andaloussi

Blood, Sweat and Tears – Aiming to understand biological nanoparticles for advancement of diagnostics and therapy

Dec 5, 2023
ANA Futura breakfast meeting

André Görgens, PhD
Researcher
Department of Laboratory Medicine
Division of Biomolecular
& Cellular Medicine
El Andaloussi Lab
Karolinska Institutet

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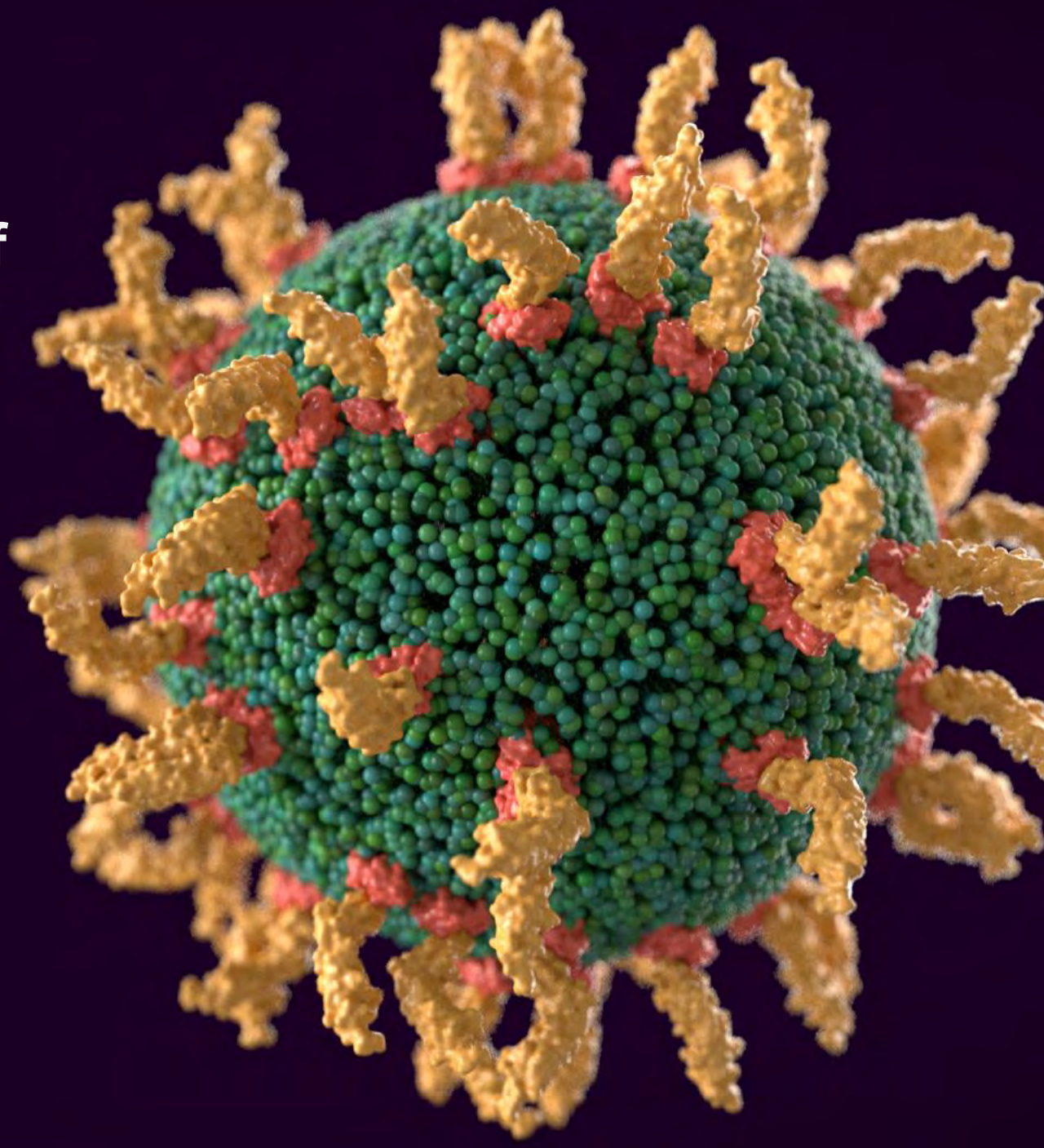
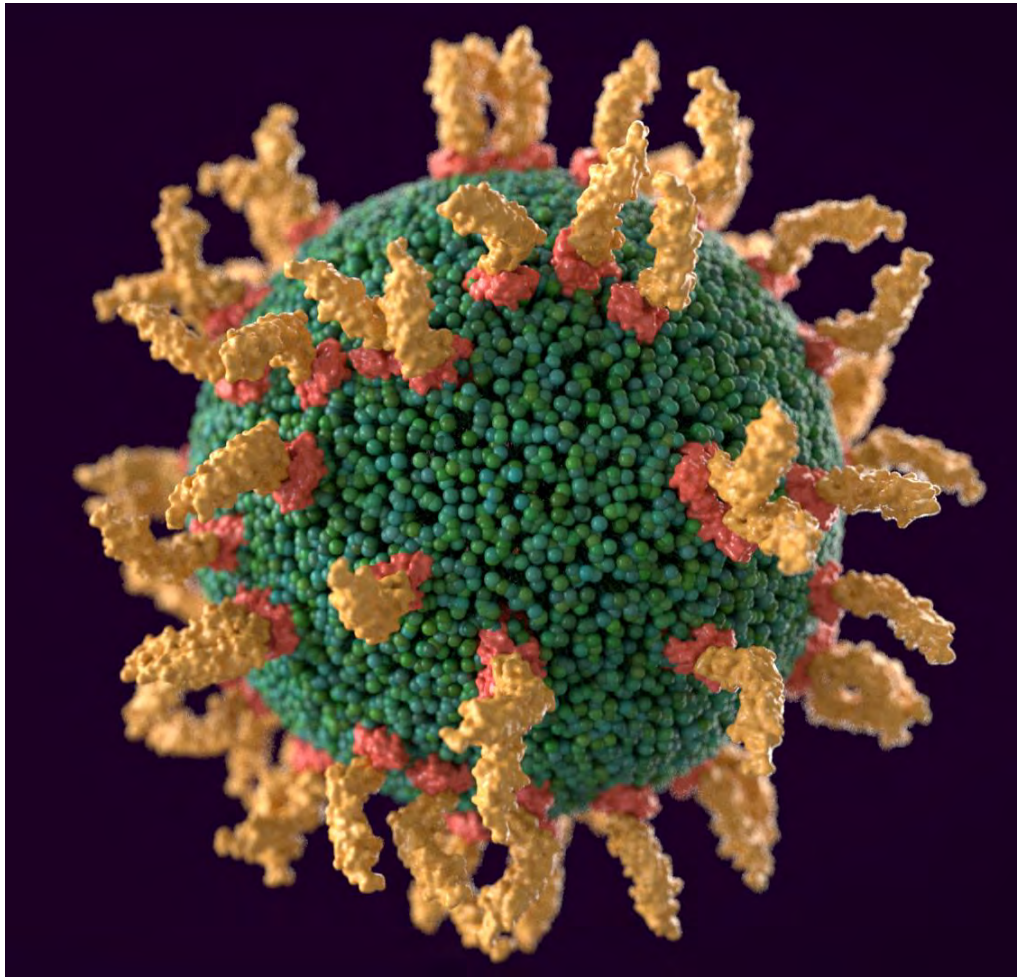
@andregorgens



Samir El Andaloussi Lab

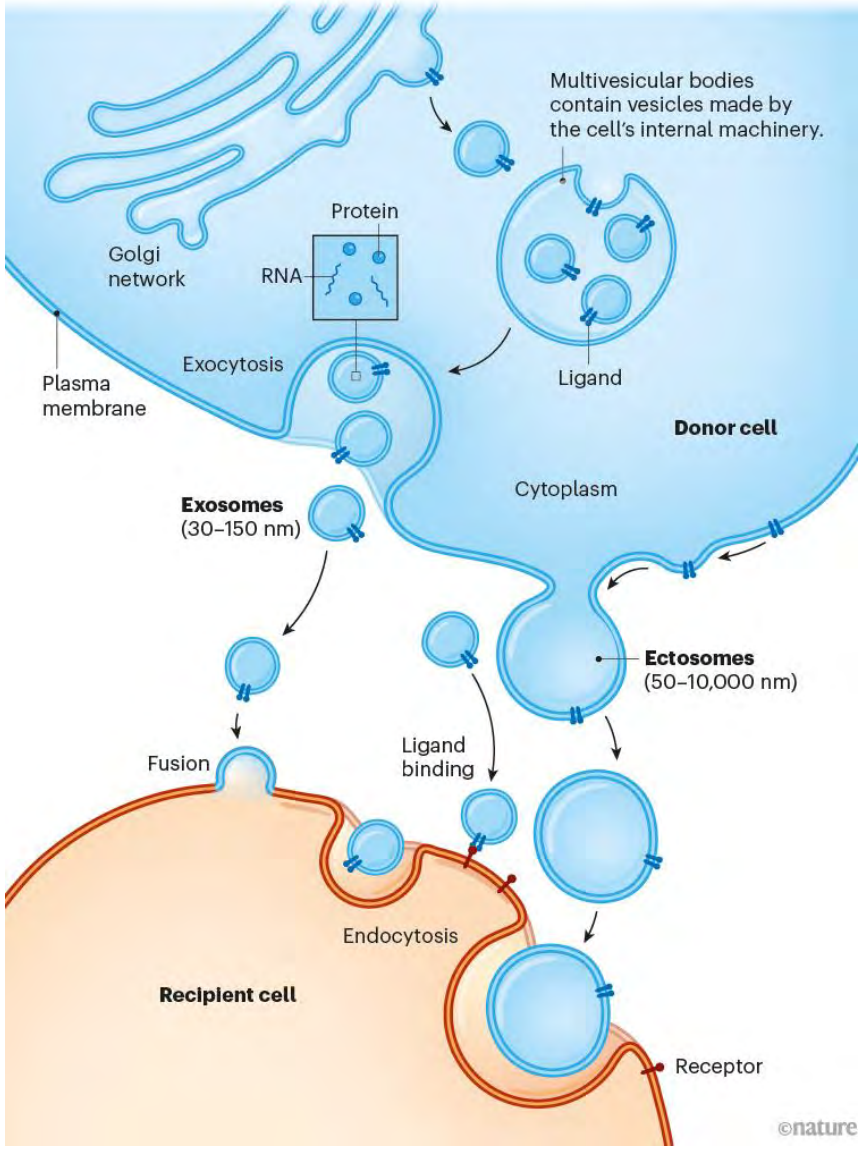
Extracellular Vesicles/Exosomes



Extracellular Vesicles (EVs)

- are nano-sized vesicles (50-150 nm) secreted by all cells
- are found in all body fluids
- are involved in inter-cellular communication
- can transport cargo between cells
- reflect the molecular composition of the parental cell

Extracellular Vesicles/Exosomes – Special Delivery?



FedEx for your cells: this biological delivery service could treat disease

Researchers want to know why cells produce tiny packages called vesicles – and whether these bundles could be used for therapy.

NEWS FEATURE | 19 September 2023

nature

Extracellular Vesicles (EVs)

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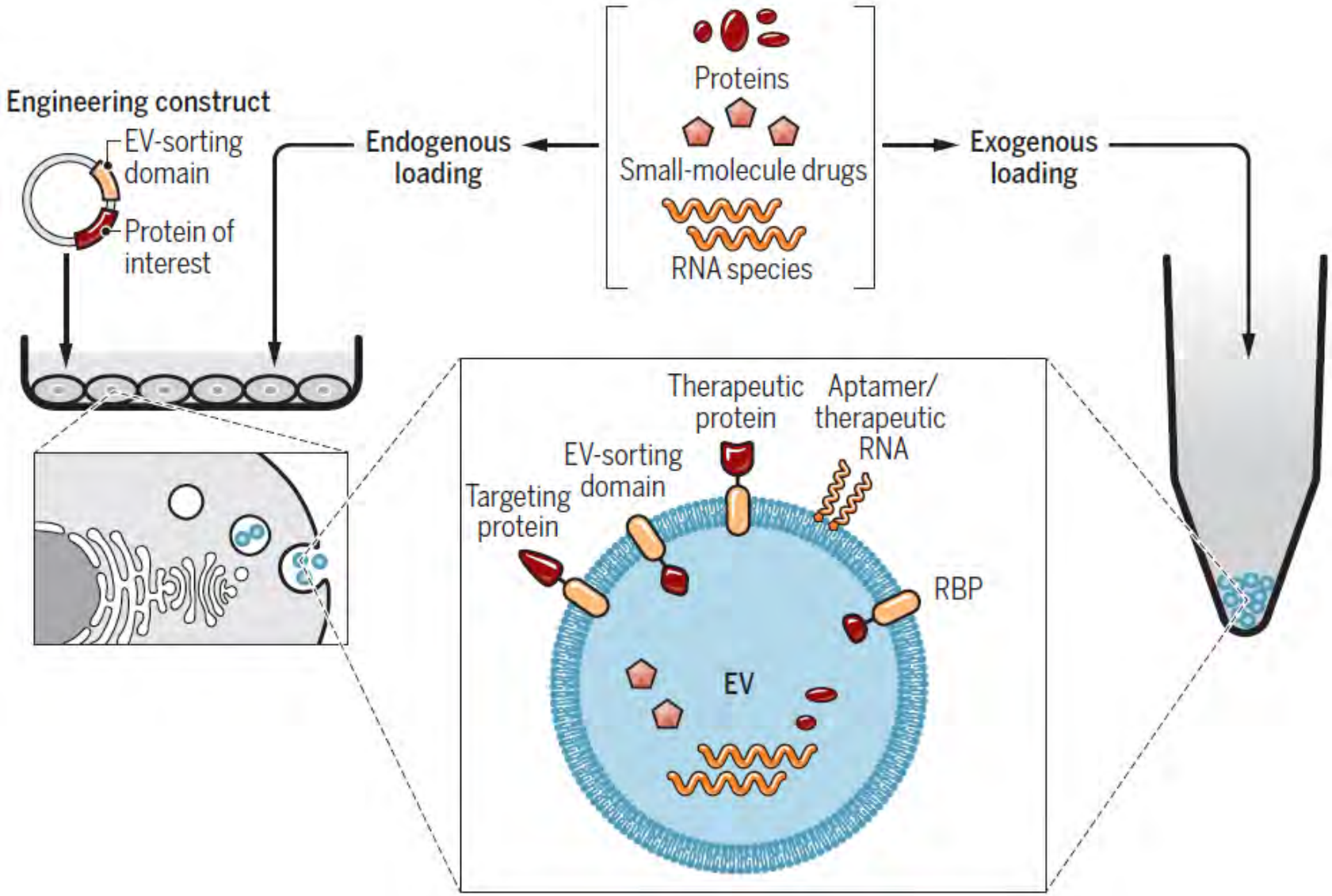
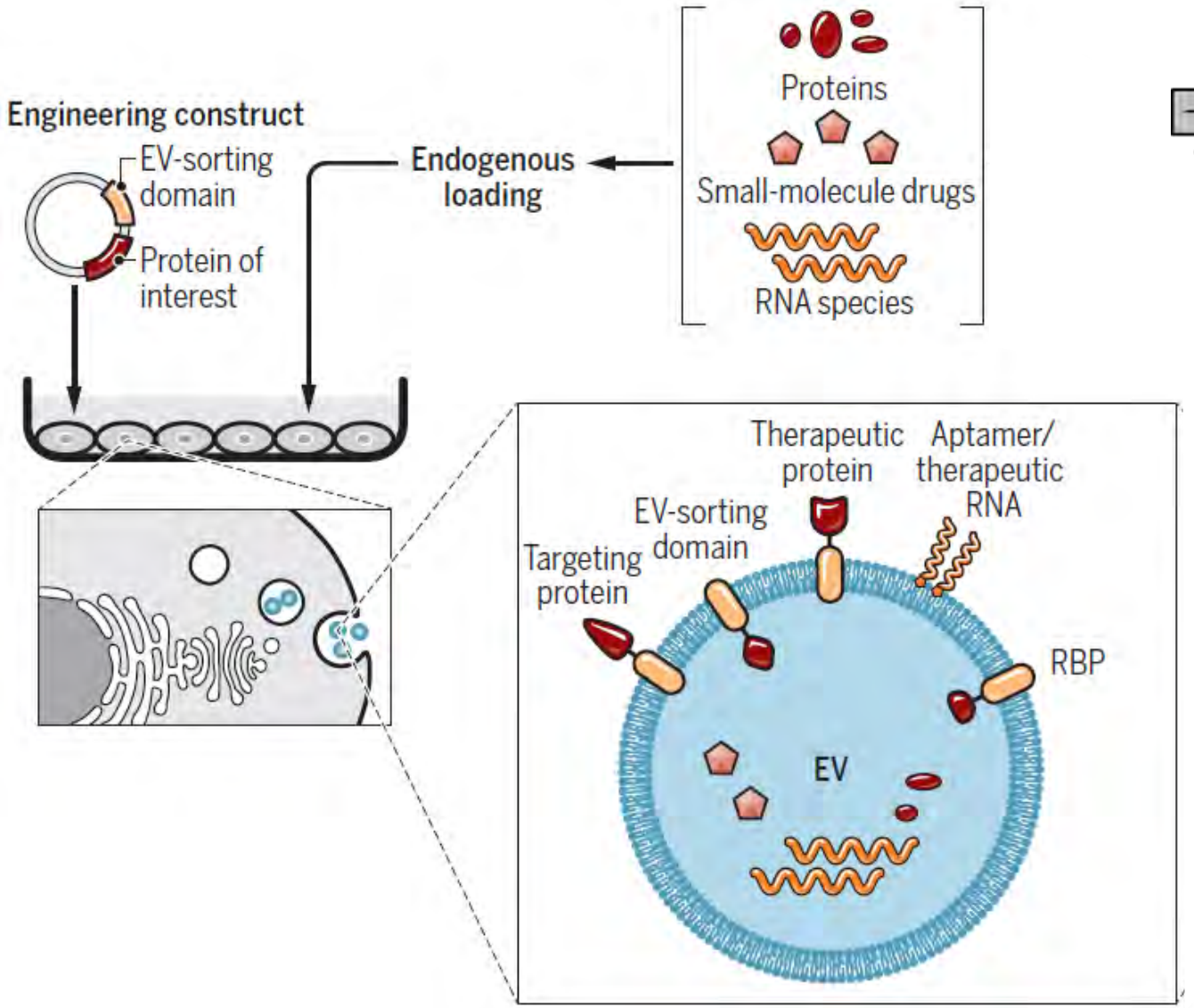
Abbot, Nature 2023

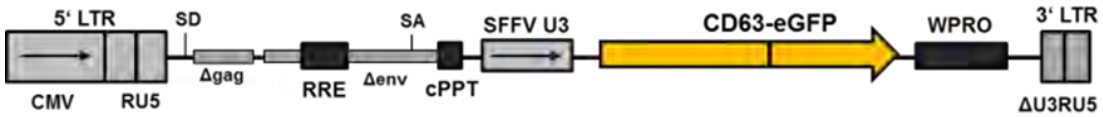
Bioengineering of EVs for Therapeutic Applications



Wiklander et al, Science Translational Medicine 2019

Bioengineering of EVs for Therapeutic Applications





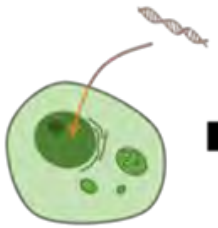
CD63-eGFP engineered EVs

Wiklander et al, Science Translational Medicine 2019

Bioengineering of EVs for Therapeutic Applications

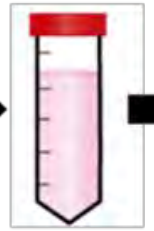
Karolinska Institutet

Genetic engineering of EV producer cells

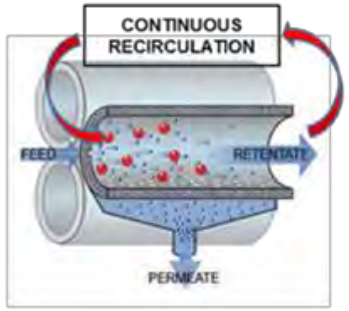


Cell culture of EV producing cells using bioreactors

Conditioned medium



Concentration of EVs with Tangential Flow Filtration

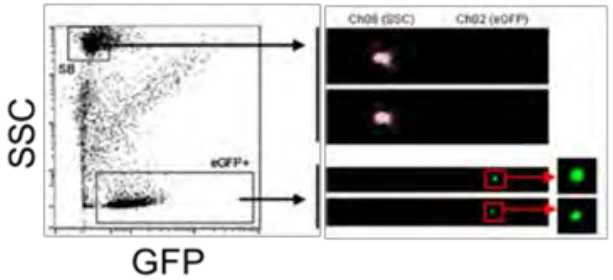


Clean-up with Size Exclusion Chromatography

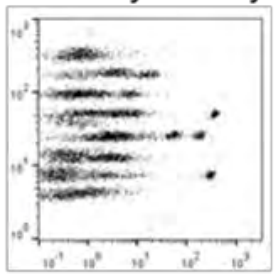
EV preparation Storage

EV analysis & characterization

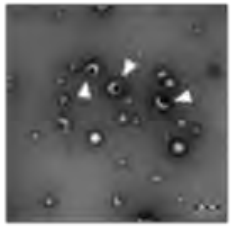
Imaging Flow Cytometry



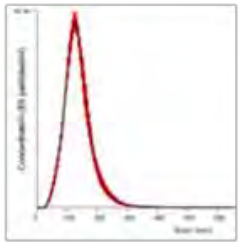
bead-based Flow Cytometry



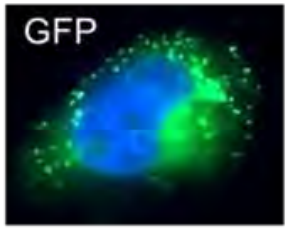
Electron Microscopy



Nanoparticle Tracking Analysis



Cellular Uptake



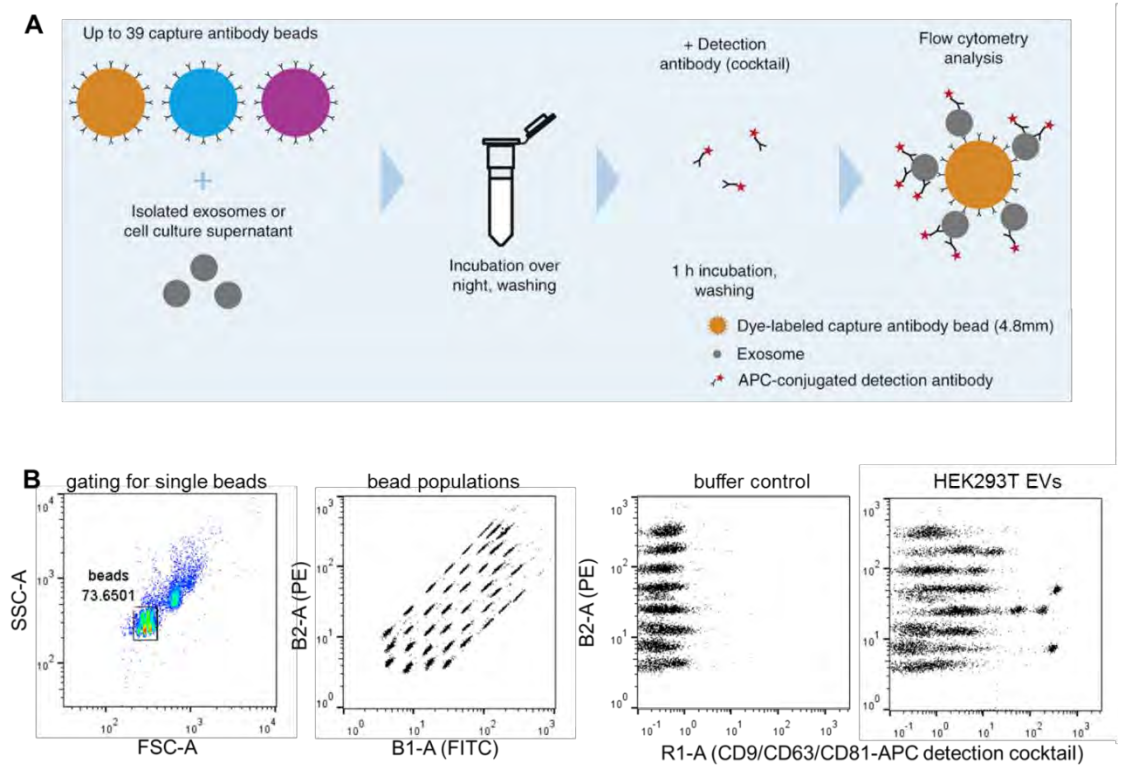
Transcriptional response

Evaluation in disease models

Biodistribution/PK

Corso, Görgens et al Sci Rep 2017; Wiklander/Görgens Front Immunol 2018; Görgens et al JEV 2019; Ricklefs, Görgens et al JEV 2019, Tertel/Görgens CytoA 2020; Gupta, Görgens et al JEV 2020; Corso, Görgens et al JEV 2020; Gupta, Görgens et al Nat Biomedical Eng 2021; Görgens et al JEV 2022; Hagey/Görgens Science Advances 2023

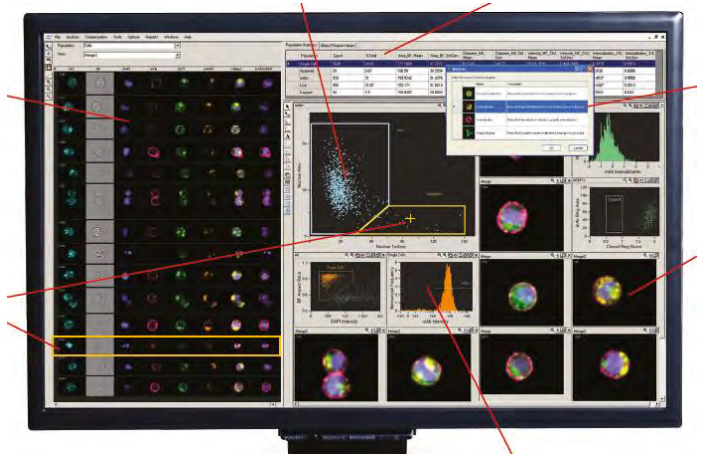
Multiplex Bead-based EV Flow Cytometry



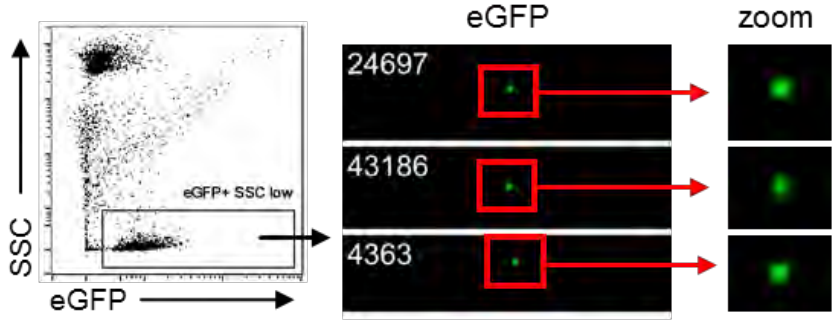
- Bulk bead-based EV capture assay
- Semiquantitative
- High throughput probing for marker co-expression
- Can be used on most flow cytometers

Wiklander,…, Görgens, Frontiers in Immunology 2018

Single EV Imaging Flow Cytometry



Amnis Imagestream X MkII



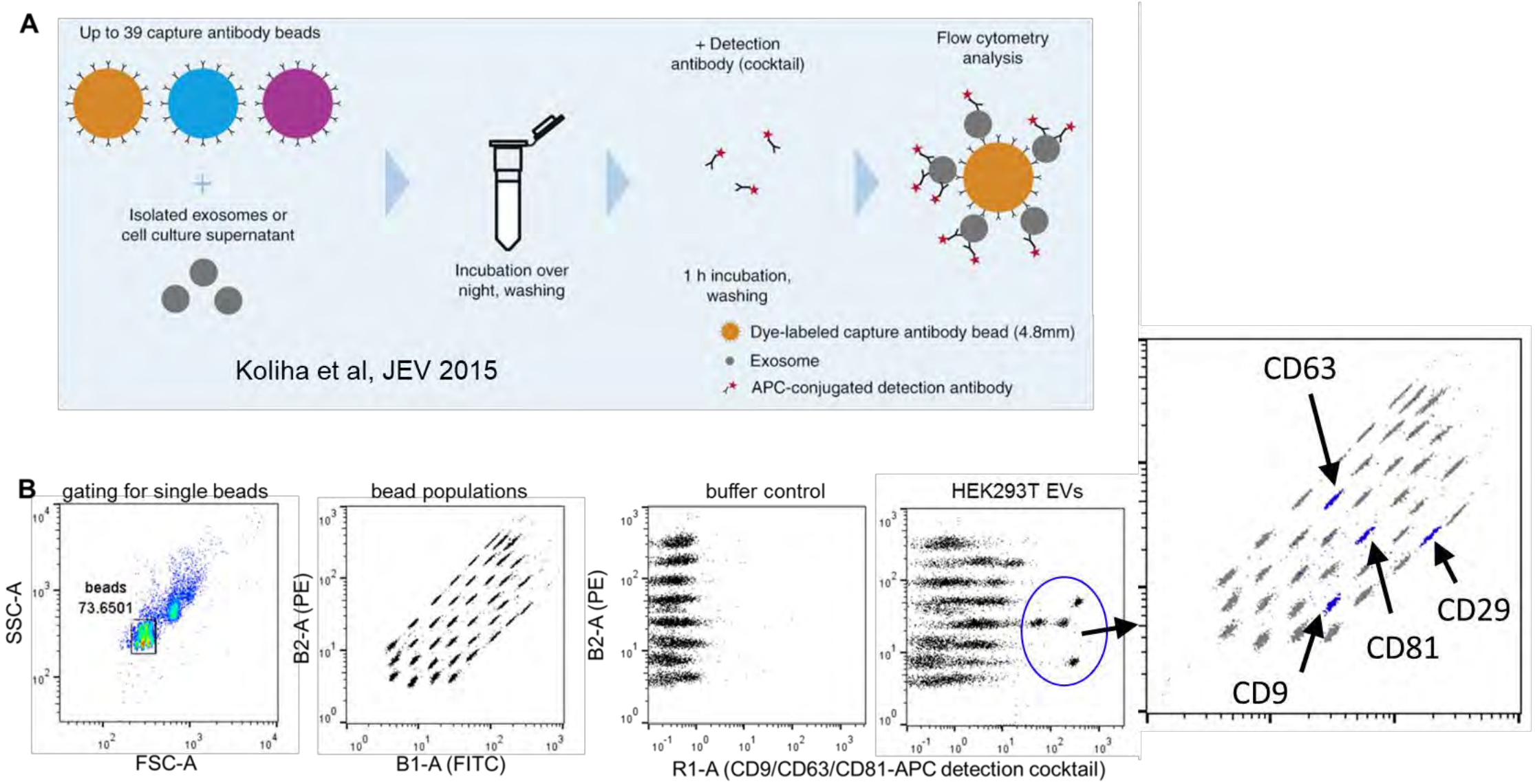
- Detection of single fluorescent EVs
- Quantitative
- Multiple parameters possible

Amnis Cellstream

No EV isolation required

Görgens et al, JEV 2019
Ricklefs et al, JEV 2019
Tertel et al, Cytometry A 2020
Görgens et al in prep

Multiplex Bead-based EV Flow Cytometry



Wiklander,…, Görgens, Frontiers in Immunology 2018

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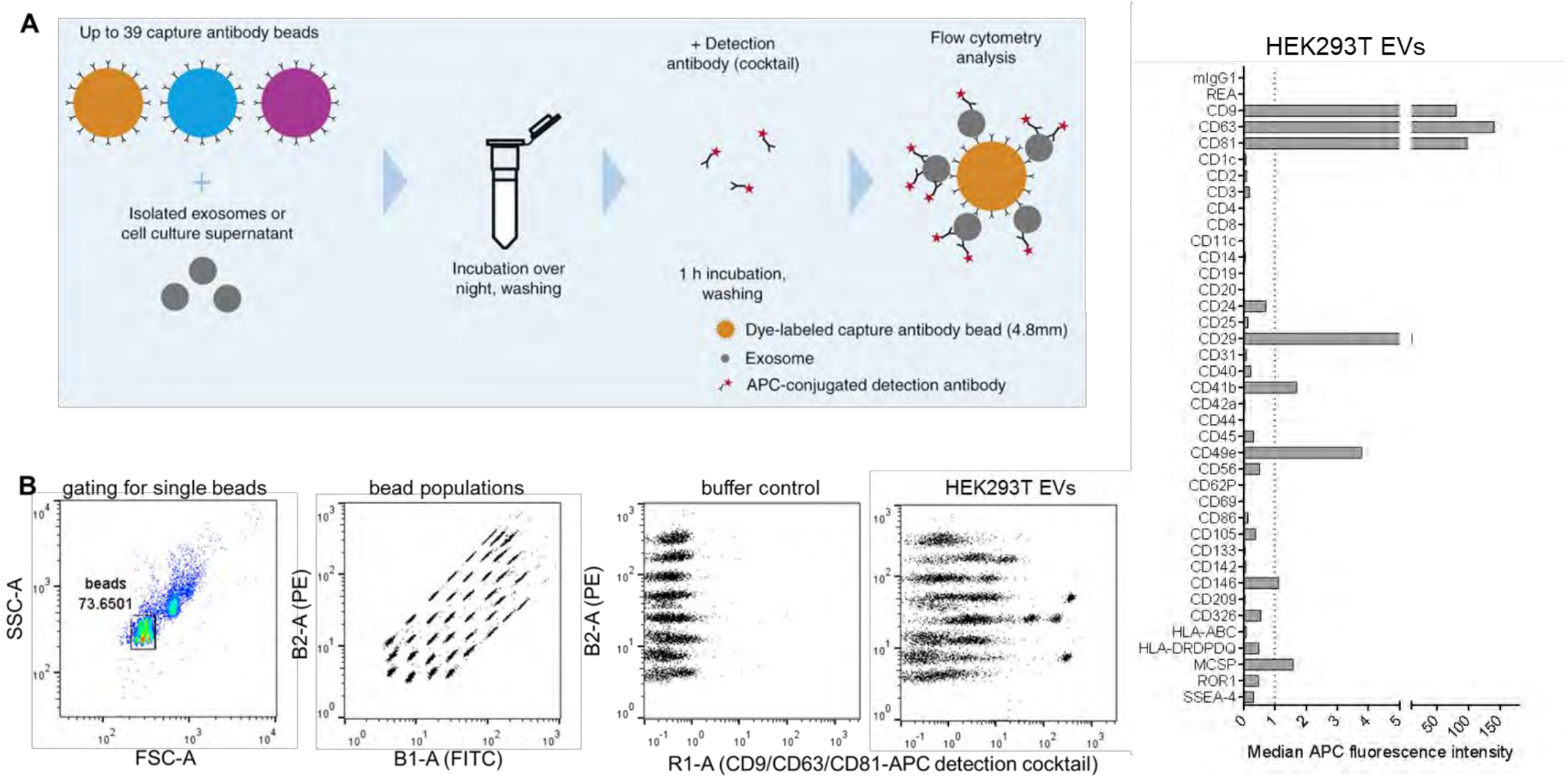
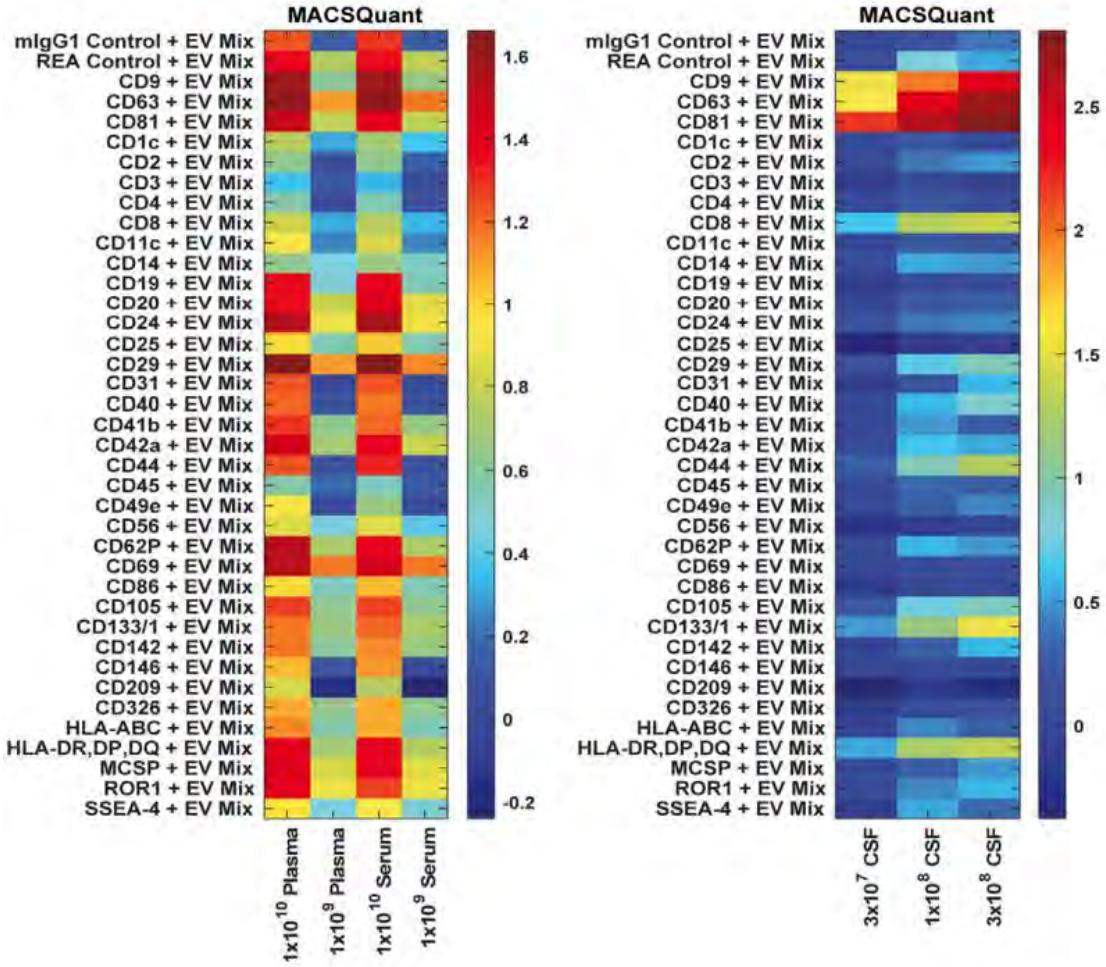
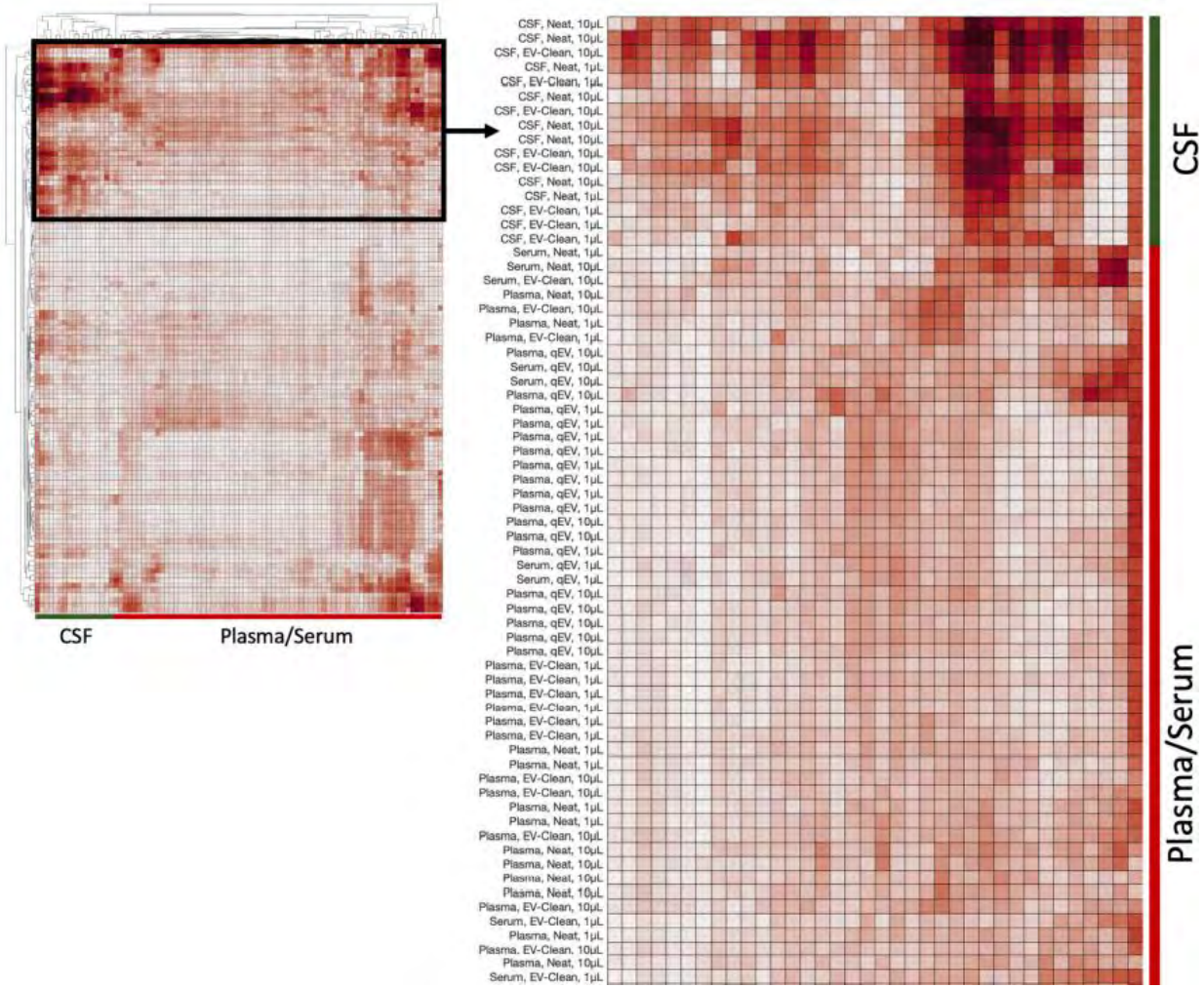


Wiklander,…, Görgens, Frontiers in Immunology 2018

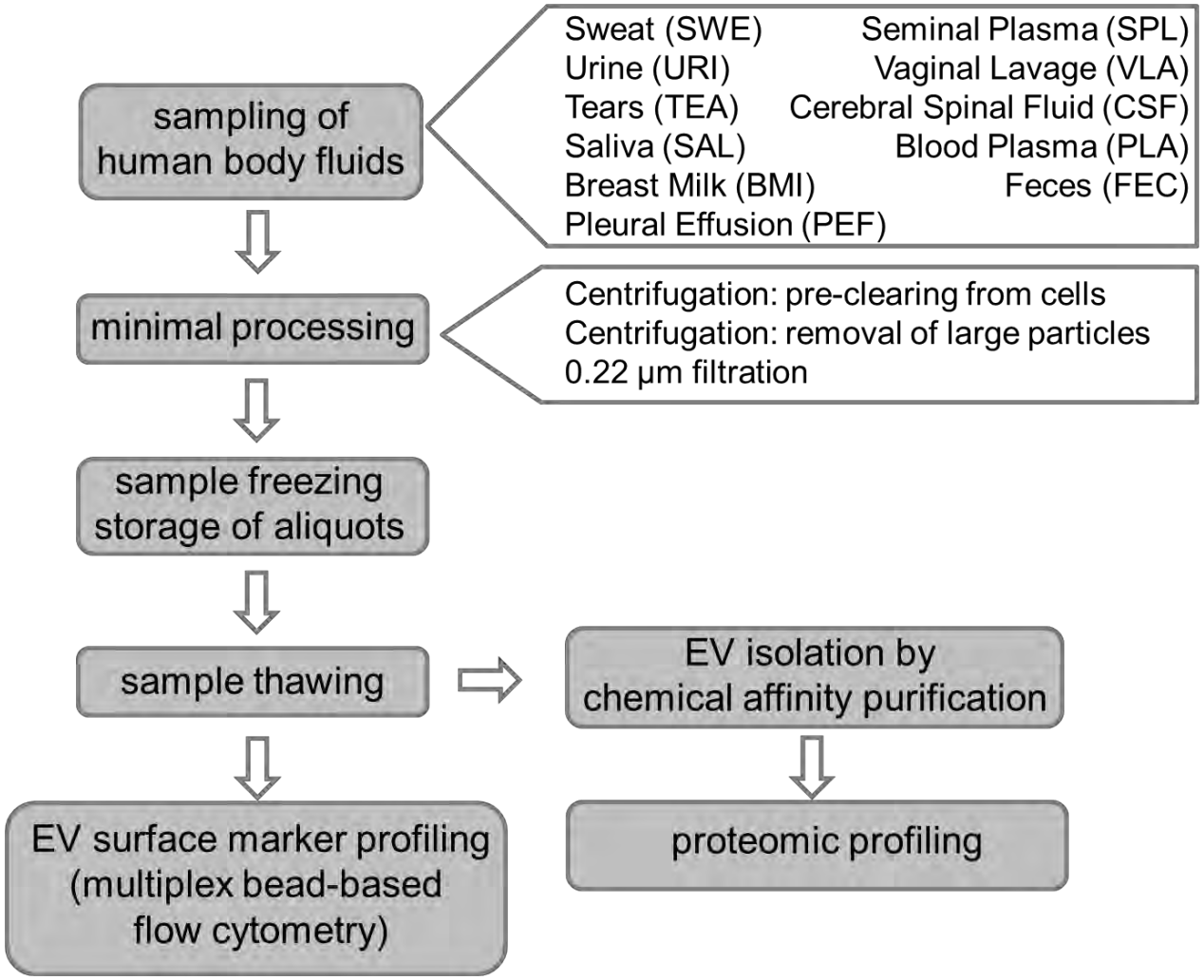
Multiplex Bead-based EV Flow Cytometry





Wiklander,…, Görgens, Frontiers in Immunology 2018; Welsh et al, Cell Reports Methods 2022

Surface marker expression on human body fluid EVs



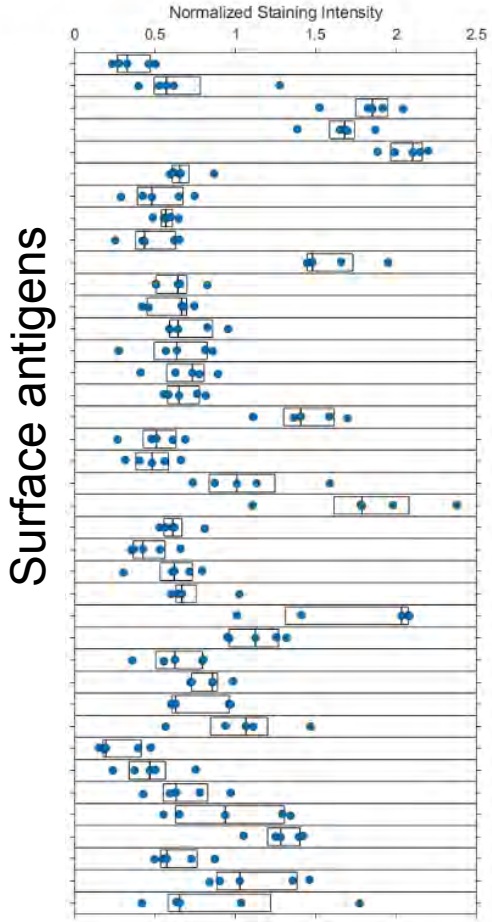
- What can we detect in a drop of body fluid? (3-50 µL)
- Focus on minimally processed samples to avoid any bias
- How different are EVs in different body fluids?
- How different are EVs from the same body fluid between donors?
- …

Görgens et al, unpublished

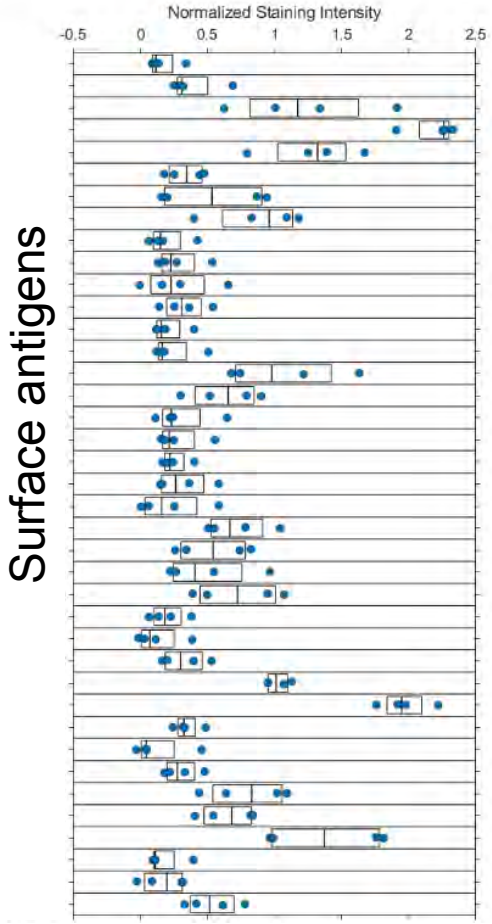
Pan: APC-conjugated anti-CD9+CD63+CD81 antibodies

Blood, Sweat and Tears?

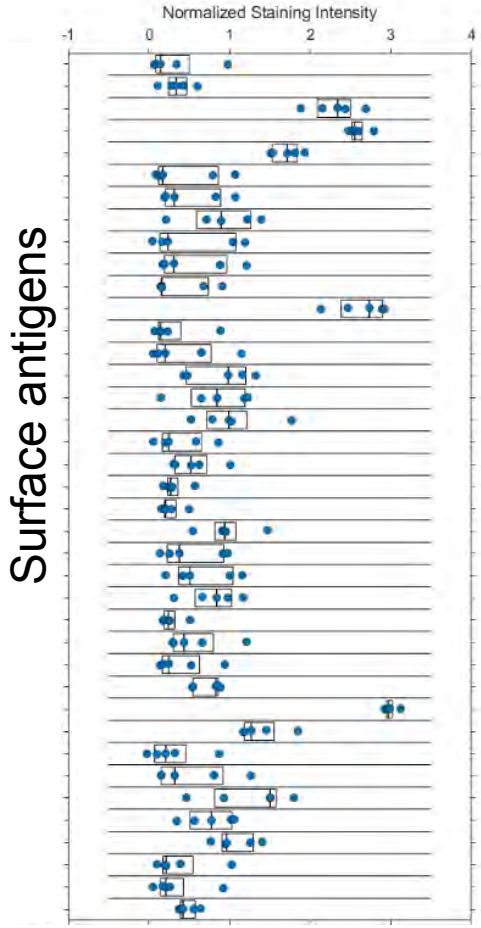
Blood Plasma EVs



Sweat EVs

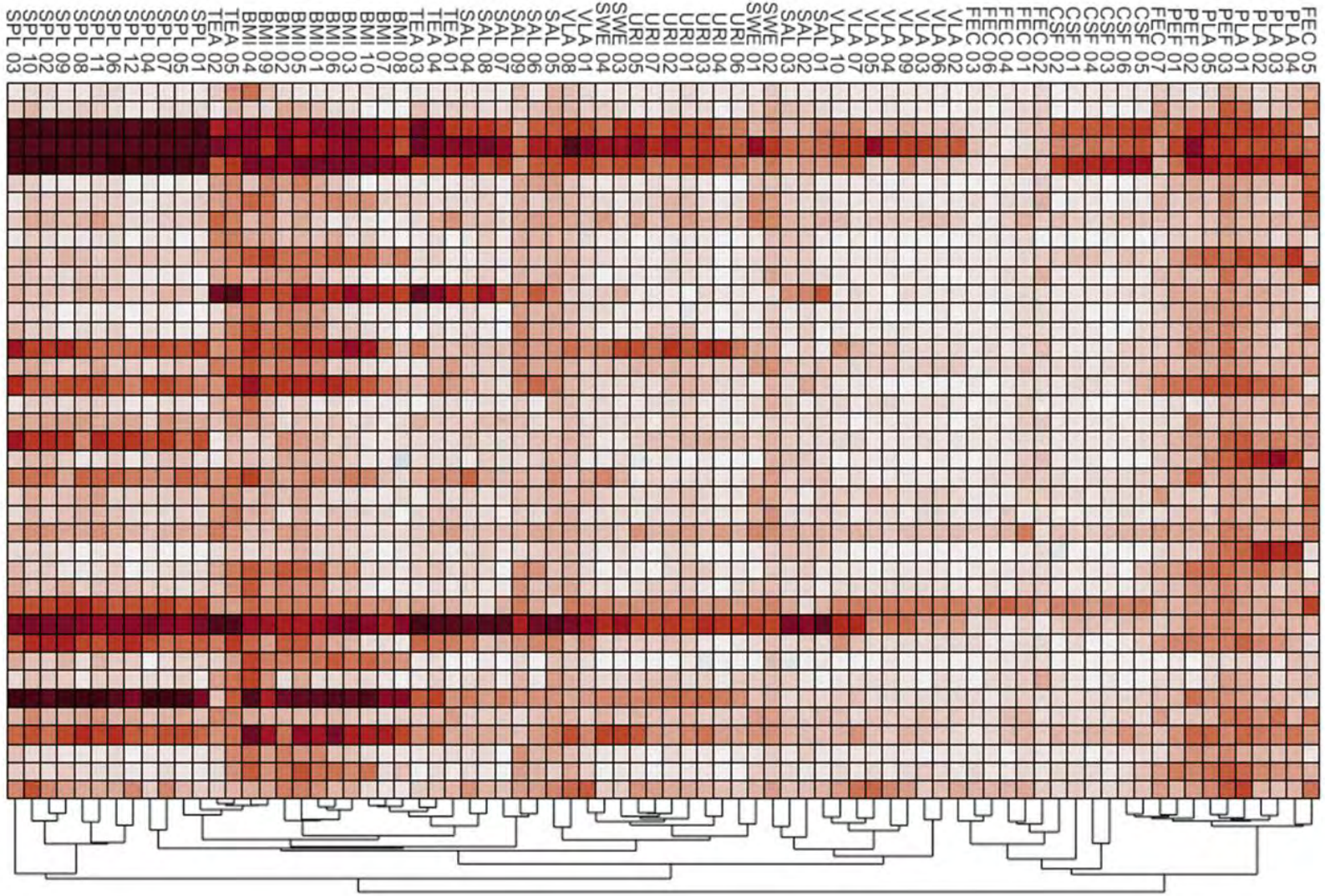


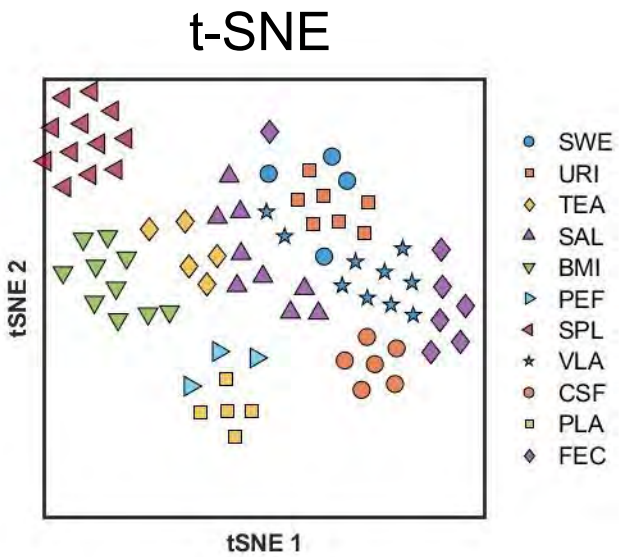
Tears EVs



Görgens et al, unpublished

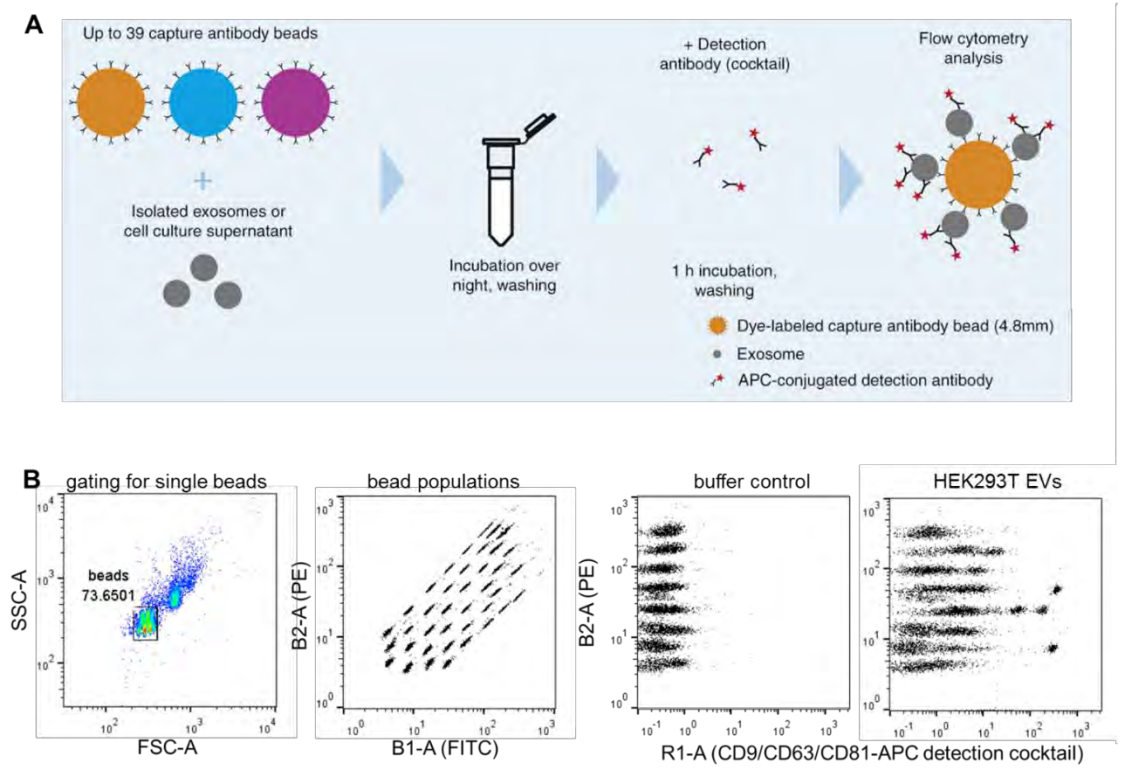
Differential EV Surface Marker Composition between human body fluids





Görgens et al, unpublished

Multiplex Bead-based EV Flow Cytometry



- Bulk bead-based EV capture assay
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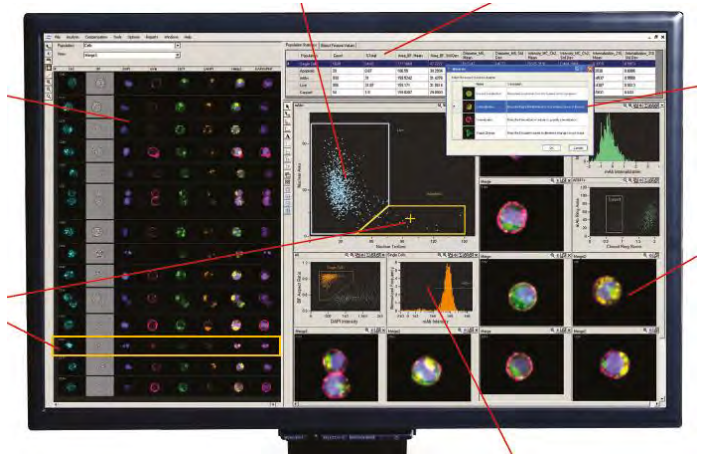
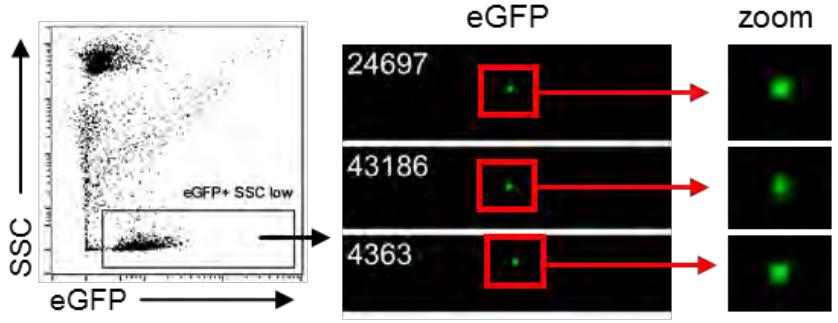
Wiklander,…, Görgens, Frontiers in Immunology 2018

Single EV Imaging Flow Cytometry



Amnis Imagestream X MkII



- Detection of single fluorescent EVs
- Quantitative
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Amnis Cellstream

No EV isolation required

Görgens et al, JEV 2019
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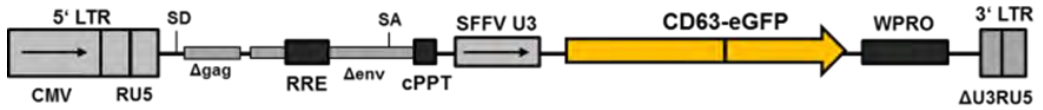
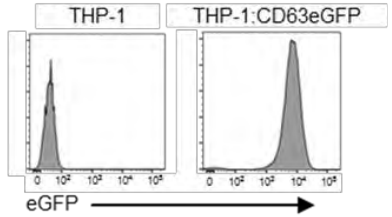
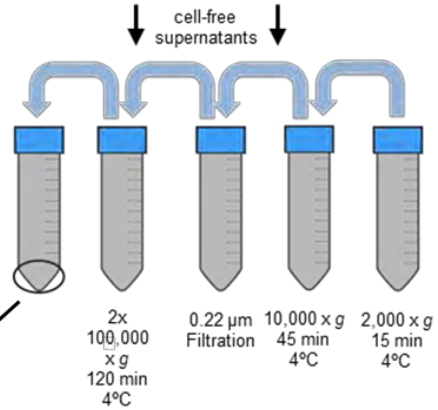
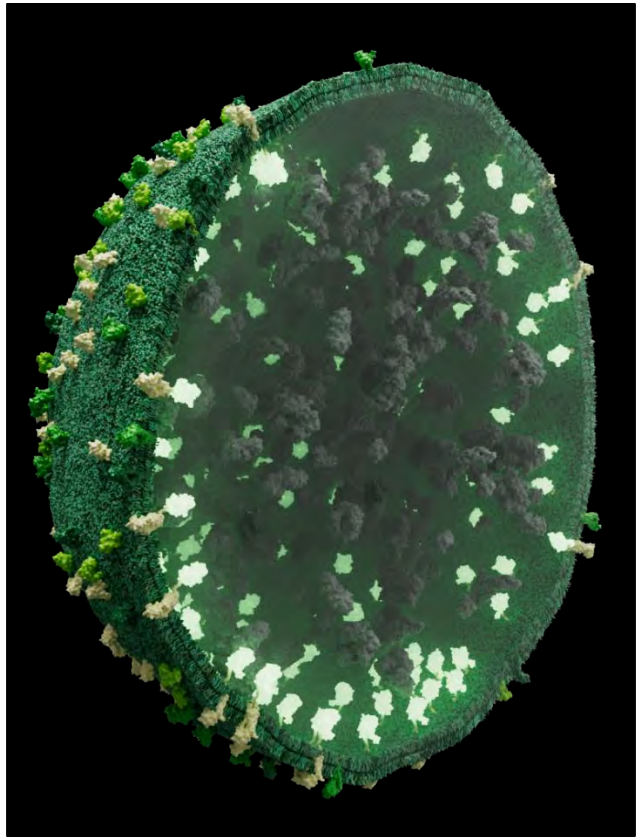
Tertel et al, Cytometry A 2020
Görgens et al in prep

Engineered EVs as Biological Reference Material



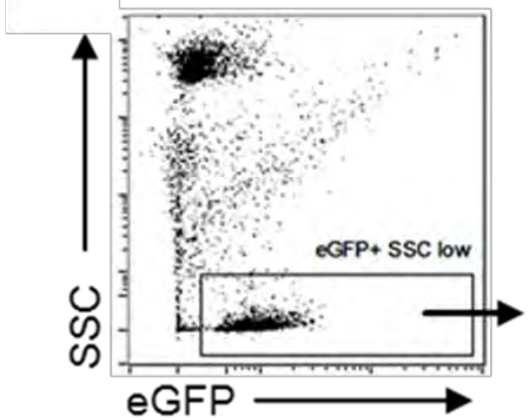


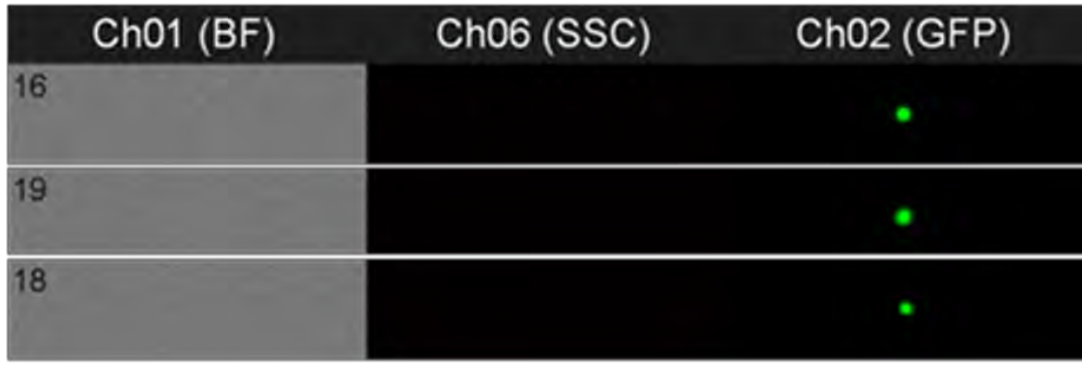




CD63-eGFP engineered EVs

Detection and quantification of single fluorescent EVs



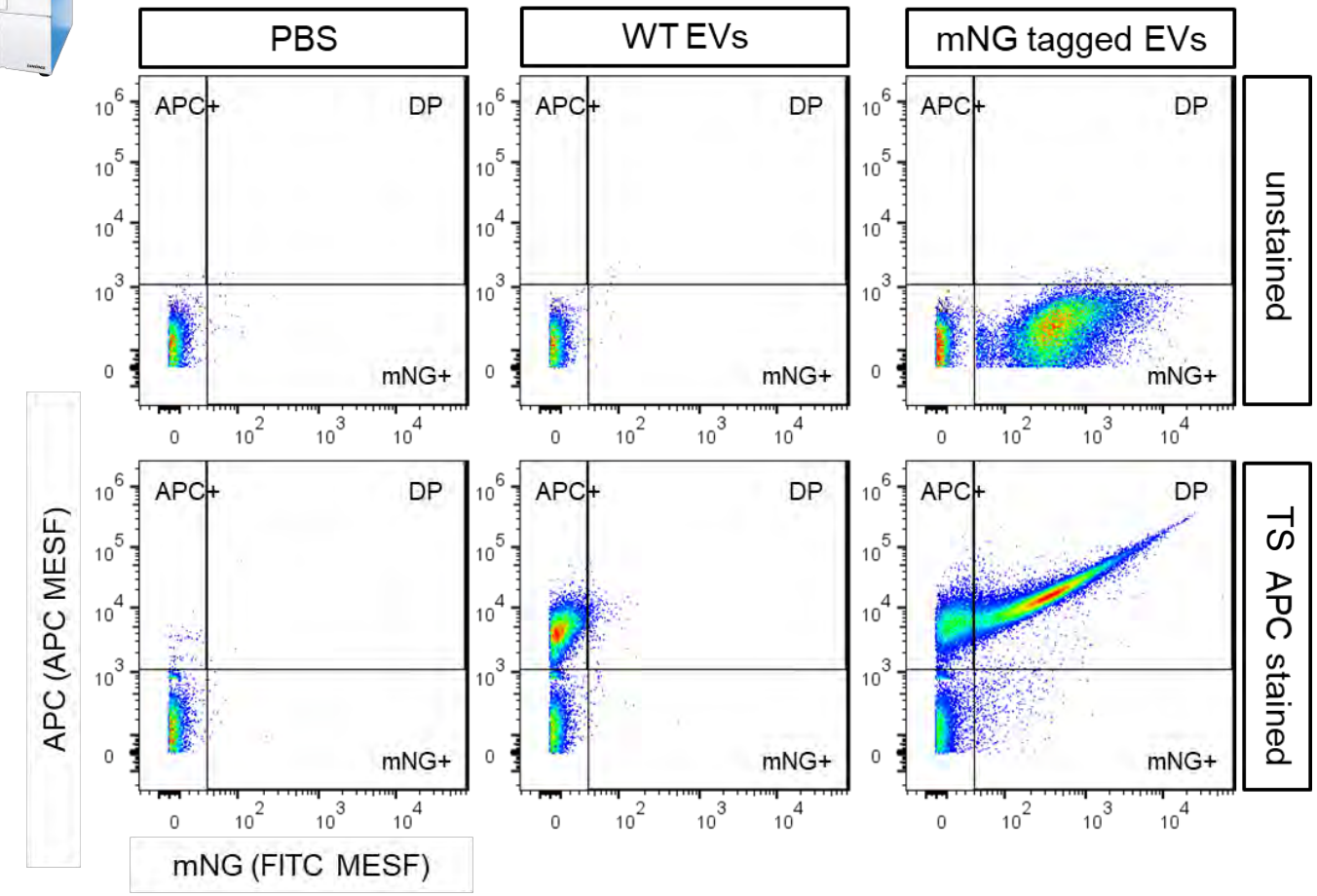


Görgens et al, JEV 2019

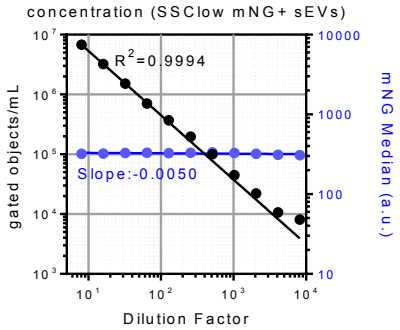
Quantification of EVs by Imaging Flow Cytometry

Karolinska Institutet

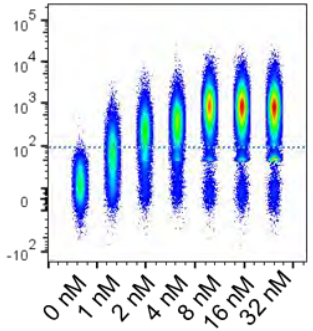
Amnis Cellstream



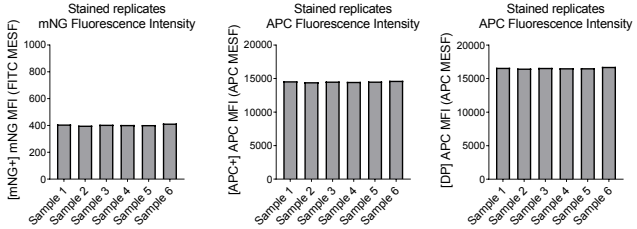
Serial dilution



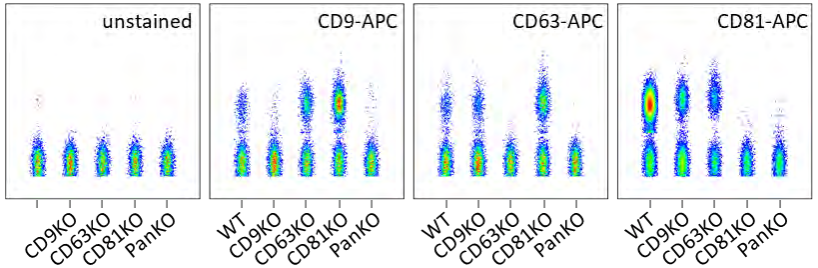
Antibody titration



Assay variability



Validation on Knock-out cell derived EVs



EV source: 293 Freestyle:CD63-mNG-IRES-PURO or WT; Görgens et al, in prep

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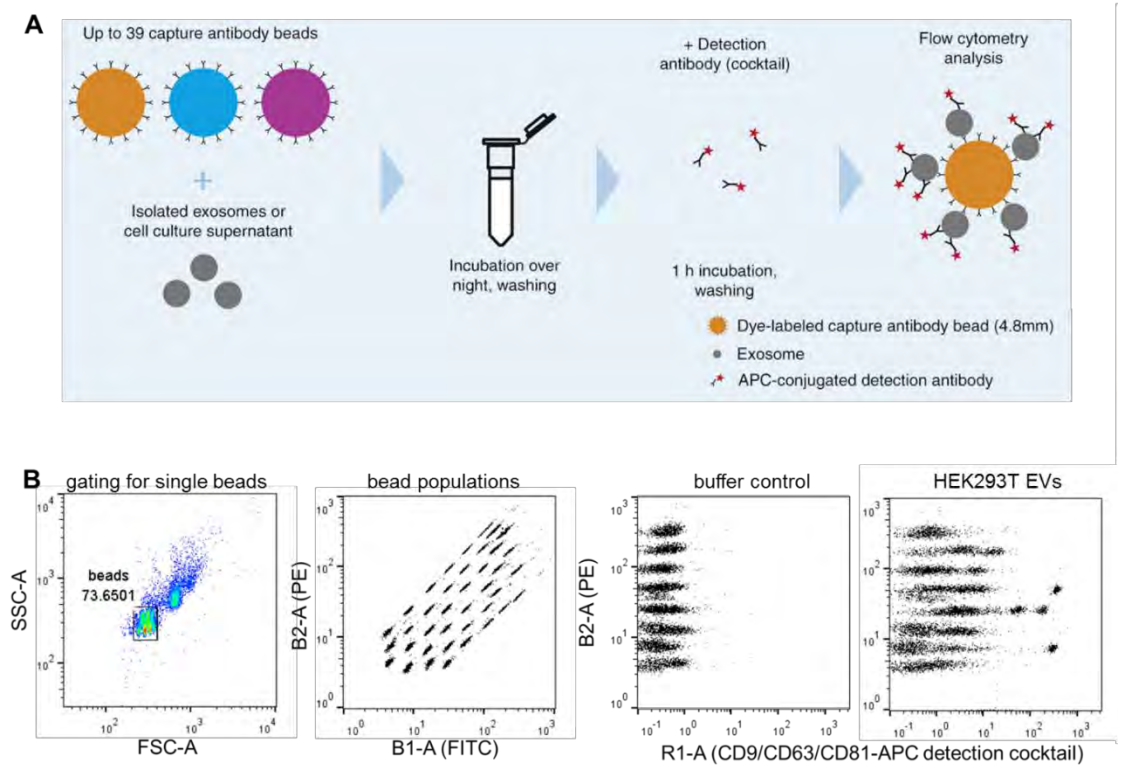

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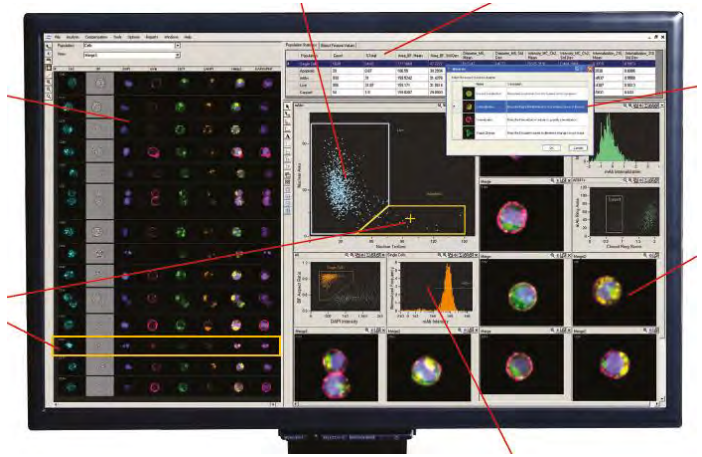
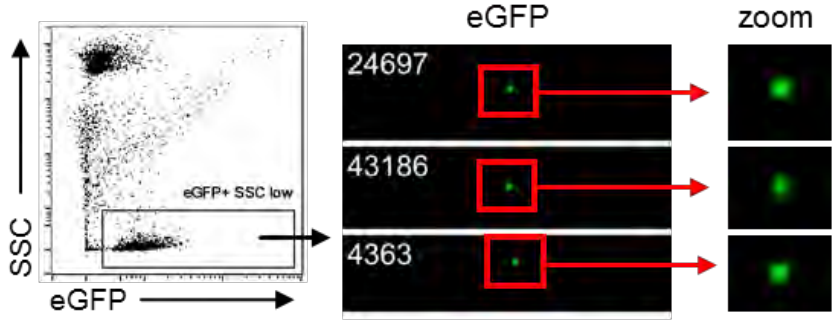


Amnis Imagestream X MkII



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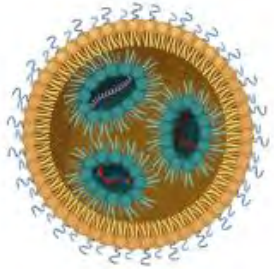
Looking forward to collaborate!

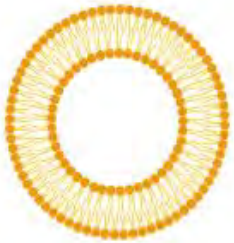
Karolinska Institutet

(Fluorescent) EVs

Other nanoparticles



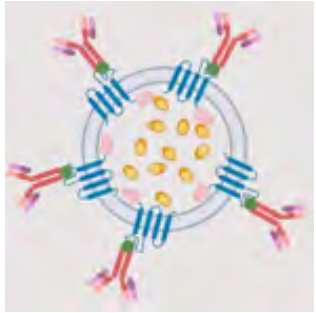
LNPs



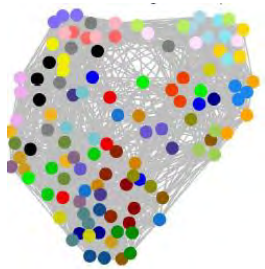
Liposomes

AAVs

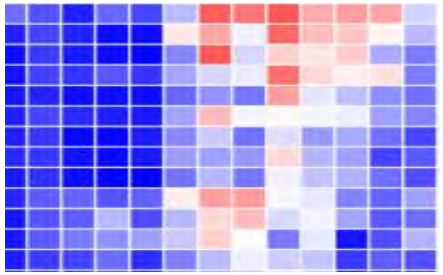
Therapeutics/Delivery



Transcriptional profiling

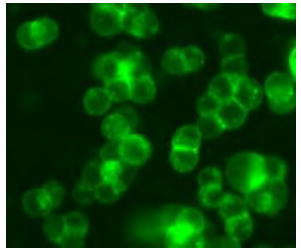


Biomarker Discovery

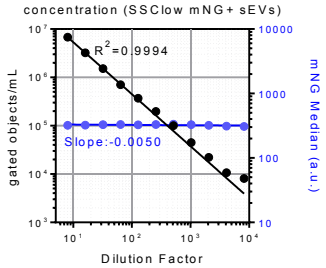


Purification

Cell Line Development



(Nanoparticle) Flow Cytometry



Nanoparticle Tracking analysis

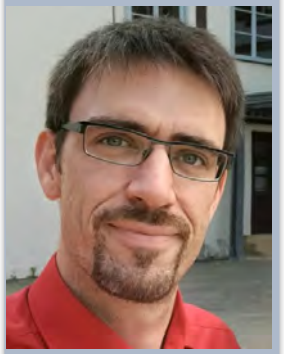
Mouse models
Biodistribution

Cell based assays

Contact:

andre.gorgens@ki.se

Questions?



André Görgens

- **Speaker: André Görgens,** researcher, Labmed / BCM
- Presentation: **“Aiming to understand biological nanoparticles for advancement of diagnostics and therapy”**
- Webpage: https://ki.se/en/labmed/research-group-samir-el-andaloussi

Questions from the staff

ANA Futura

Karolinska Institutet