PROTEIN CORONA AS A TRASLATIONAL BARRIER IN CANCER NANOCARRIER DESING

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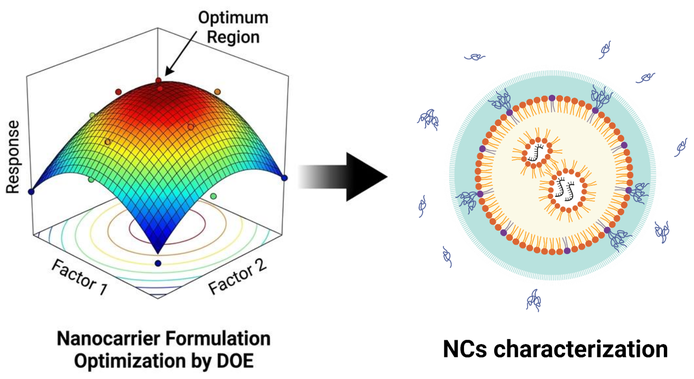
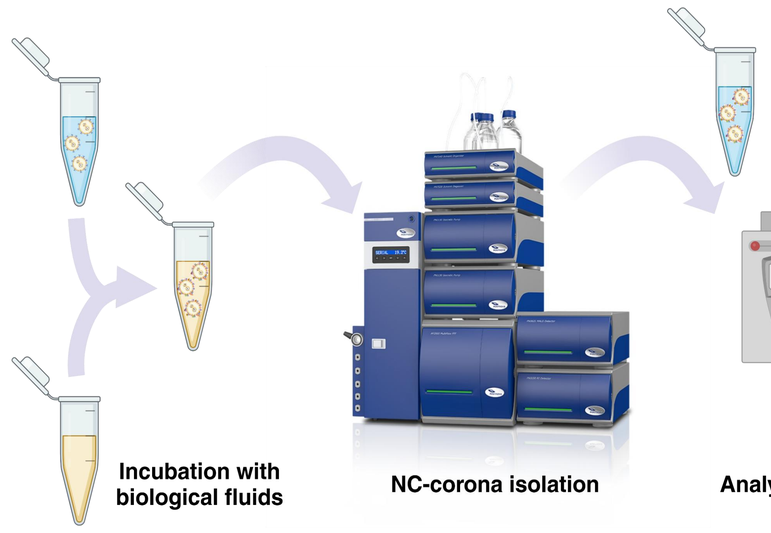
INTRODUCTION

The **Biocorona**, formed by **protein adsorption** onto **nanocarriers** (NCs) in **biological fluids**, critically **influences** their **biodistribution**, **targeting**, and **clearance,** especially in **cancer therapies**. However, its characterization remains a **major challenge** in **nanomedicine**. Here, we establish a **standardized methodology** using Asymmetrical Flow Field-Flow Fractionation **(AF4)** to analyze the protein corona with high resolution. This approach enables **efficient screening of NCs**, guiding the selection of **candidates with optimized biocorona profiles** for **improved biodistribution** and therapeutic performance.



Nanocarrier Formulation Optimization by DOE

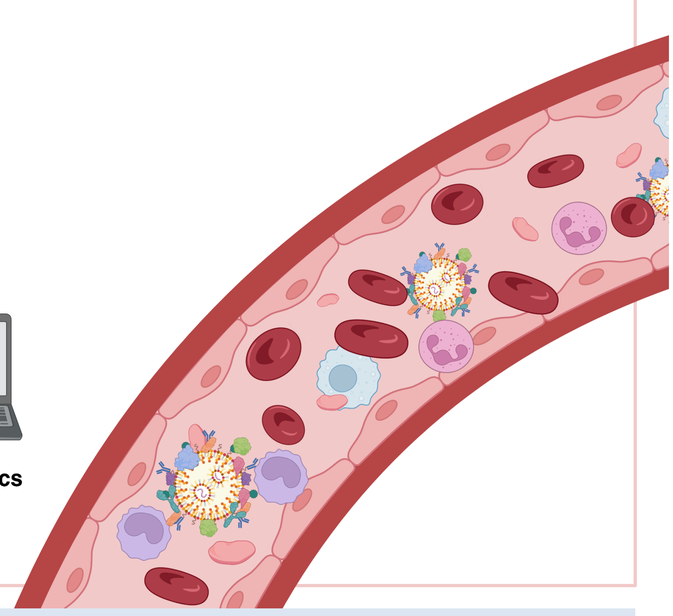
NCs characterization



Incubation with biological fluids

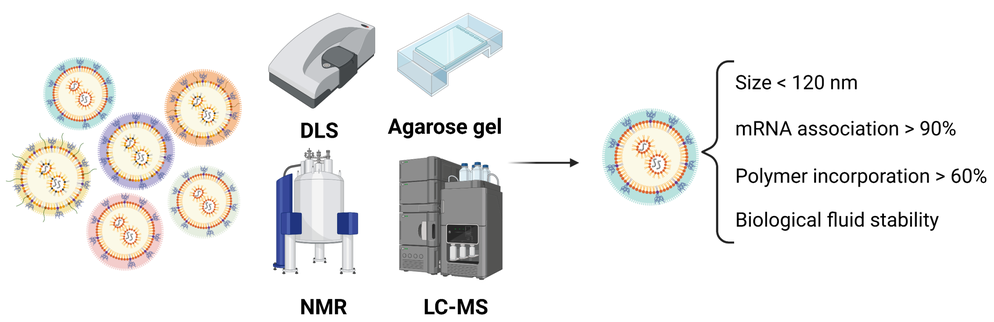
NC-corona isolation

Analysis by proteomics

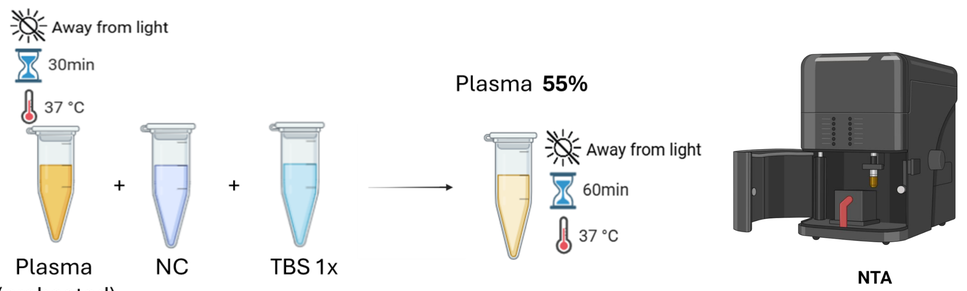


MATERIALS AND METHODS

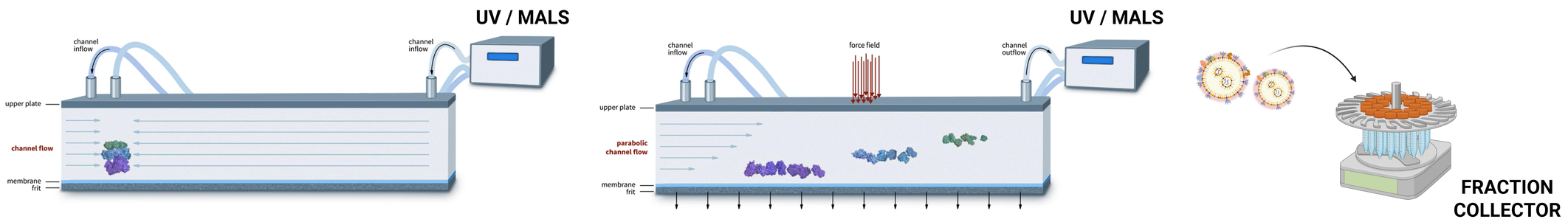
1 NC characterization



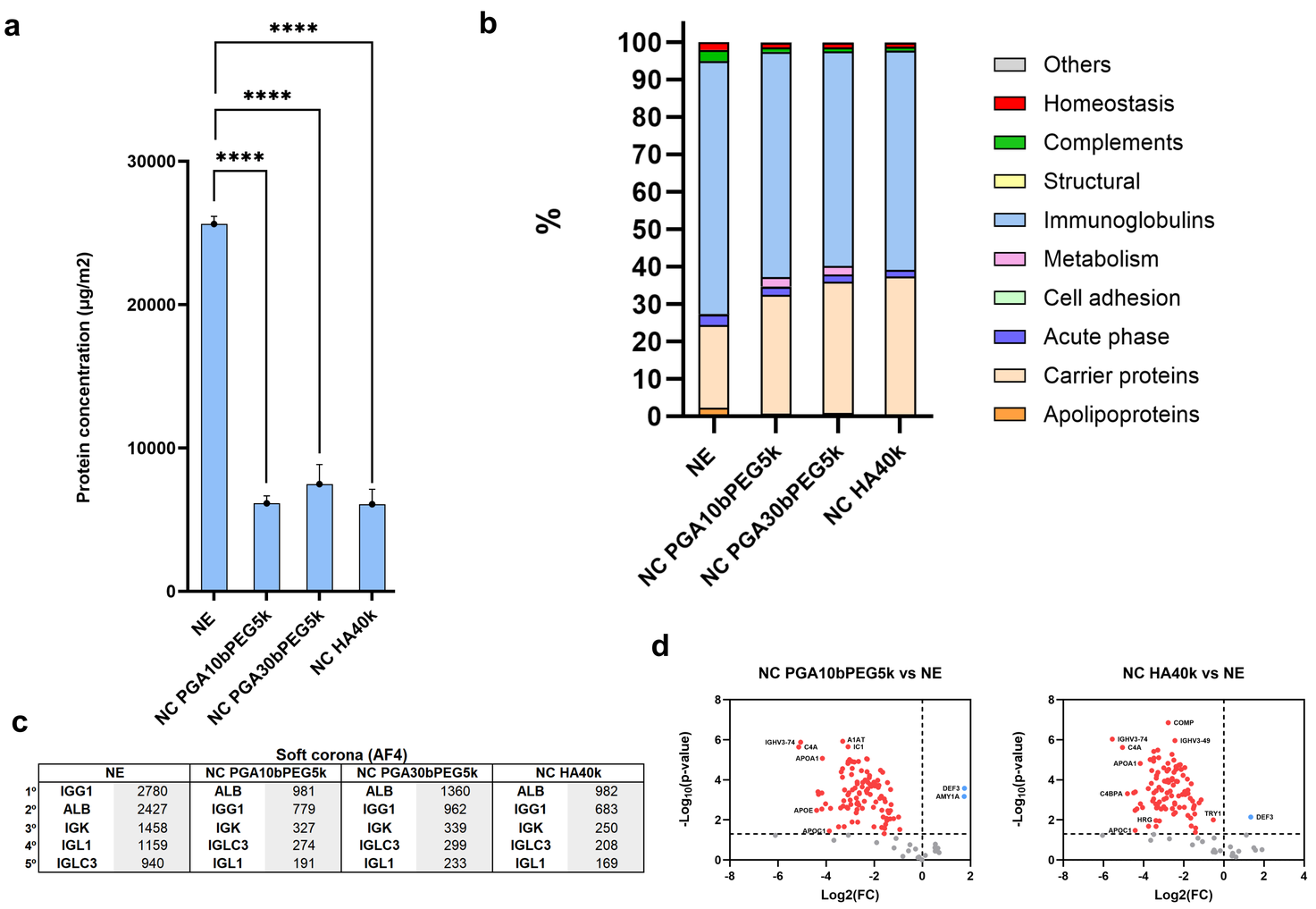
2 NC plasma incubation



3 NC isolation by AF4



RESULTS



	NE		NC PGA10bPEG5k		NC PGA30bPEG5k		NC HA40k	
1º	IGG1	2780	ALB	981	ALB	1360	ALB	982
2º	ALB	2427	IGG1	779	IGG1	962	IGG1	683
3º	IGK	1458	IGK	327	IGK	339	IGK	250
4º	IGL1	1159	IGLC3	274	IGLC3	299	IGLC3	208
5º	IGLC3	940	IGL1	191	IGL1	233	IGL1	169

Fig. 1. Human plasma protein corona analysis. **a** Total absorbed protein amount in µg/m². Data represent mean ± SEM (n=3). **b** Percentage contribution of protein functional categories to the corona. **c** Top 5 protein molecules per particle for NE, NC PGA10bPEG5k, NC PGA30bPEG5k and NC HA40k. Volcano plots of protein corona composition pairwise comparisons: NC PGA10bPEG5k vs. NE (left), NC HA40k vs. NE (right). Gray = not significant; red = depleted (p<0.05); blue = enriched (p<0.05). n=3.

CONCLUSIONS

AF4 analysis of the **Biocorona** helps **identify key proteins** that affect **NCs biodistribution**, **guiding** the **design** of **better formulations** for improved **safety** and **targeting.**

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