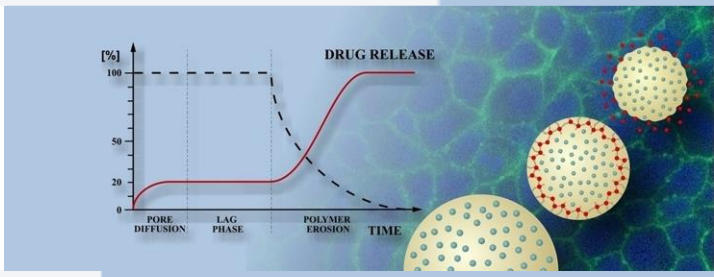
Philipps Universität Marburg

Enhanced Gene Delivery by Lipid Triblock Nano-Carriers



IMRAN TARIQ

Department of Pharmaceutics and Biopharmaceutics
Philipps Universität Marburg, Germany

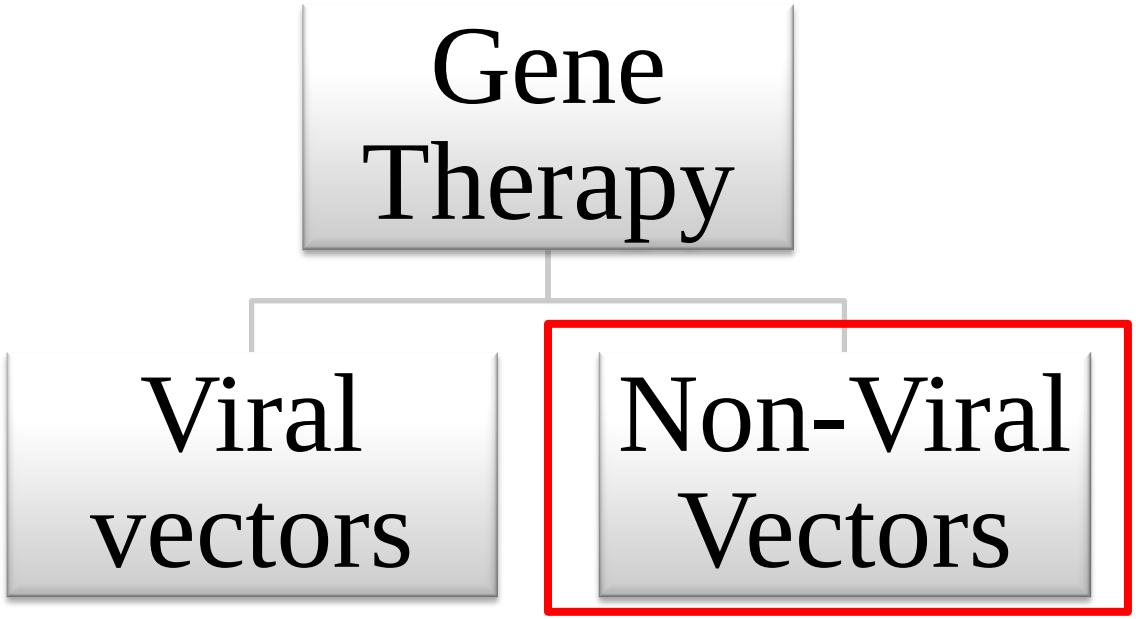
***Research Supervisor*:Prof. Dr. Udo Bakowsky**

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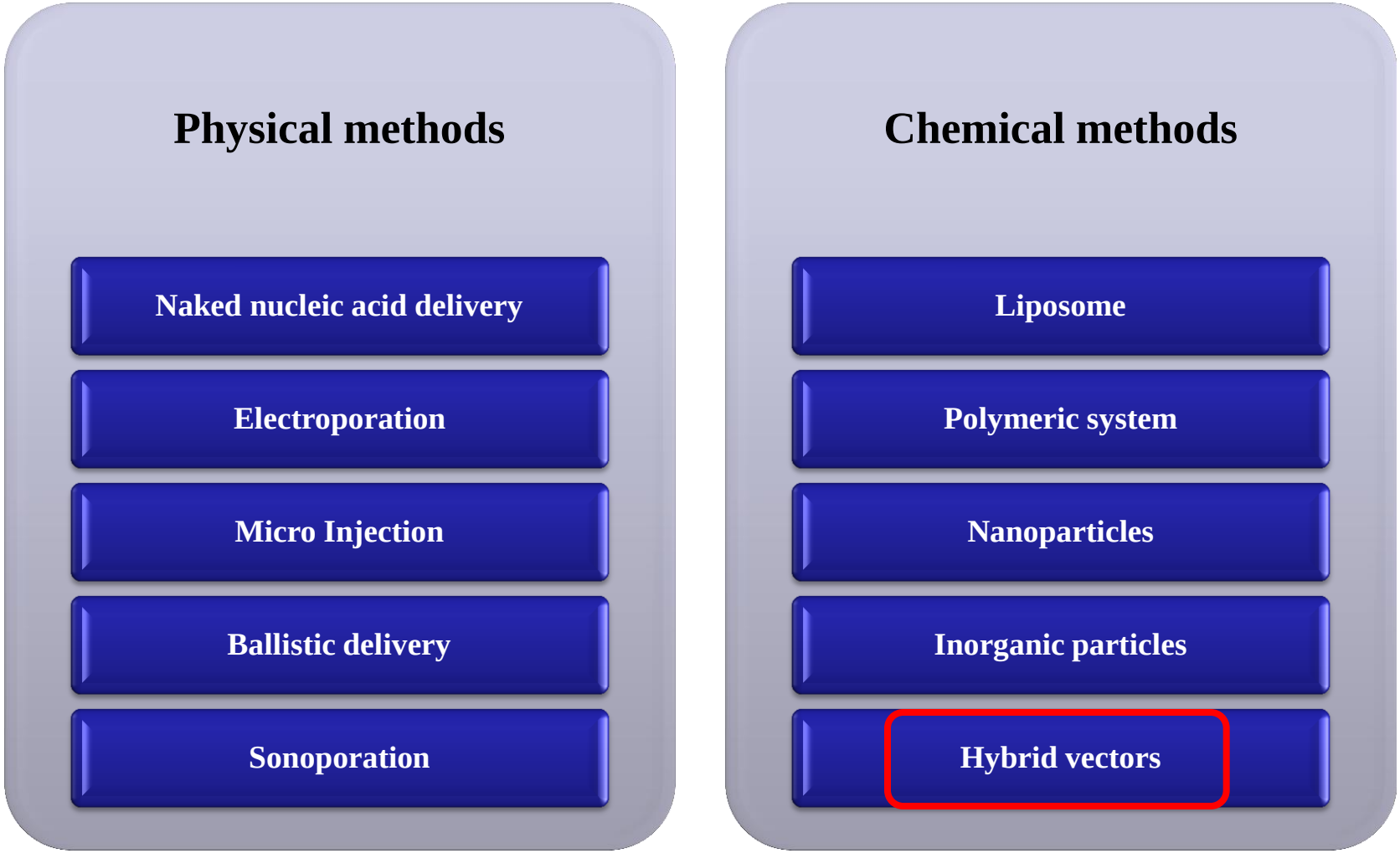
- Introduction to Gene therapy
- Challenges to Non-viral gene delivery
- Lipodendriplexes
- Results
- Conclusion

Gene Therapy

- **Replacing a mutant gene** that cause disease with healthy copy of gene.
- **Knock out a mutated gene** that functions improperly.
- **Introducing a new gene** into the body to help in fight against disease.

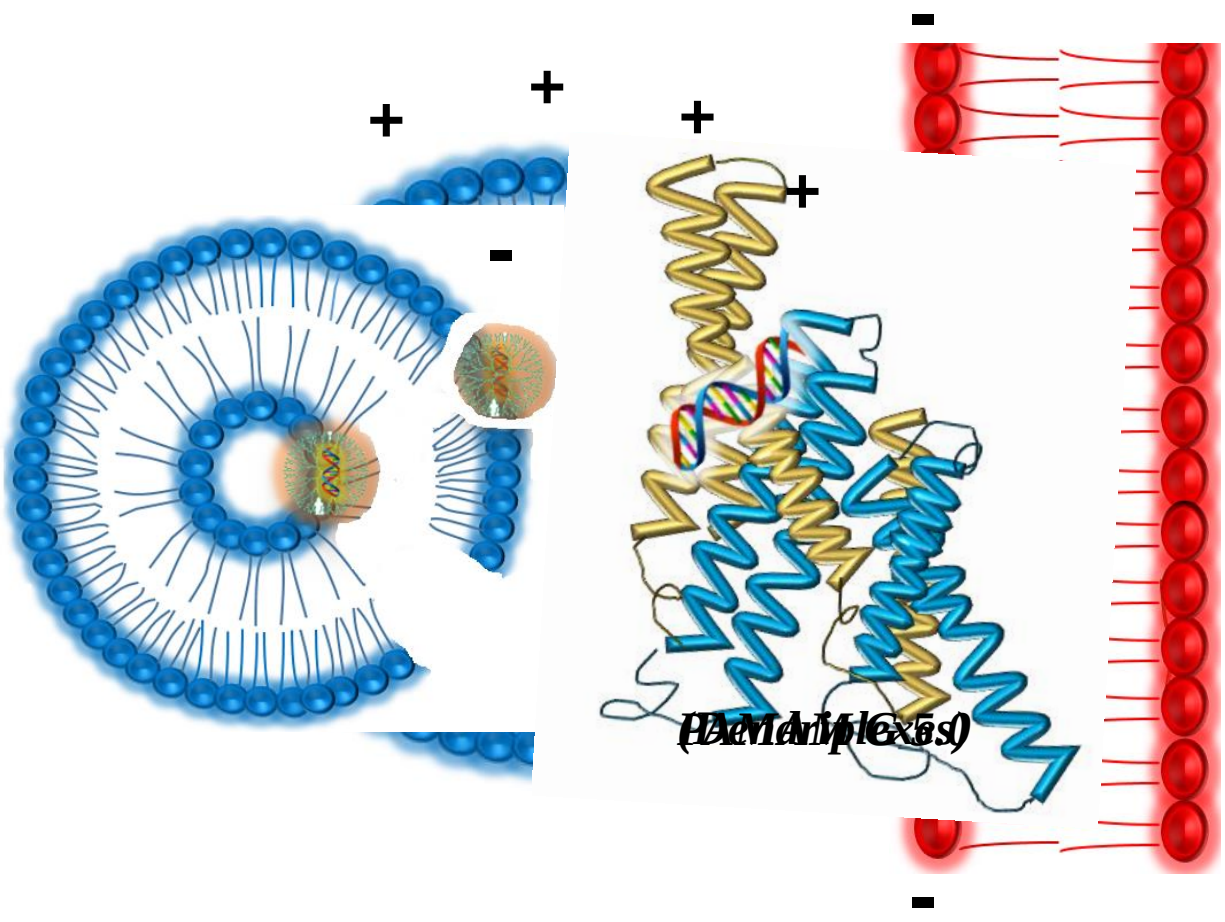


Non- viral gene therapy

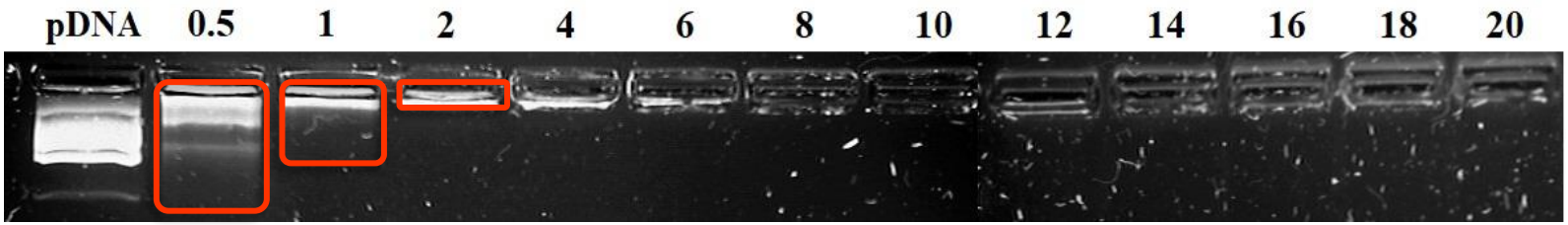


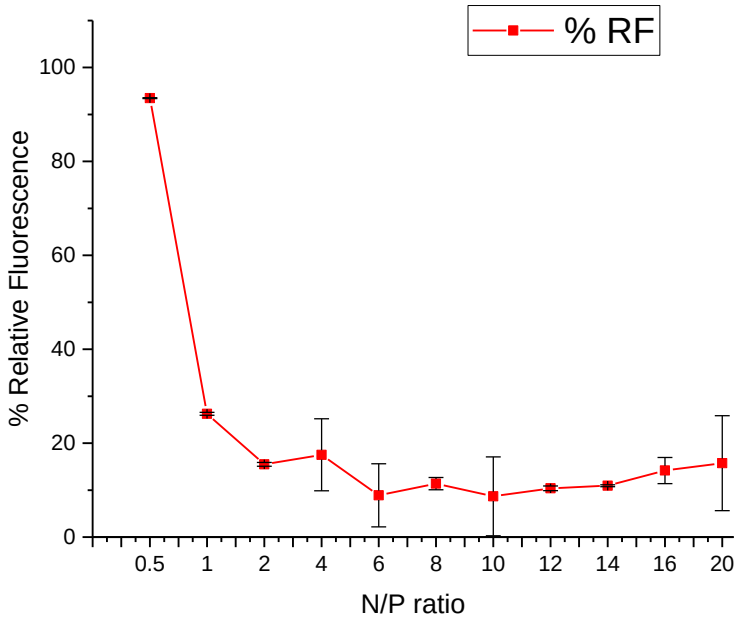
Challenges in non-viral gene delivery

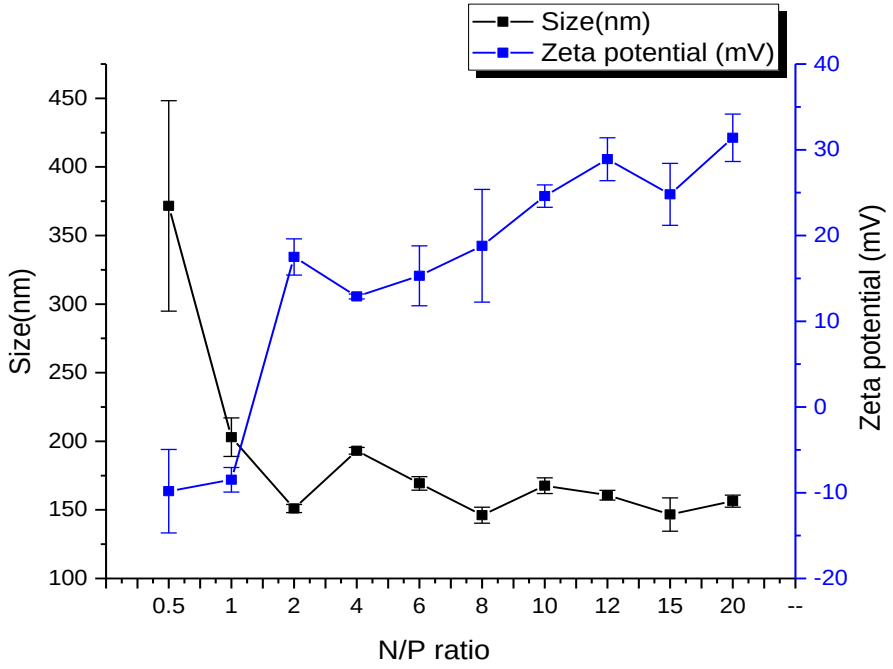
Lipoplexes as delivery system



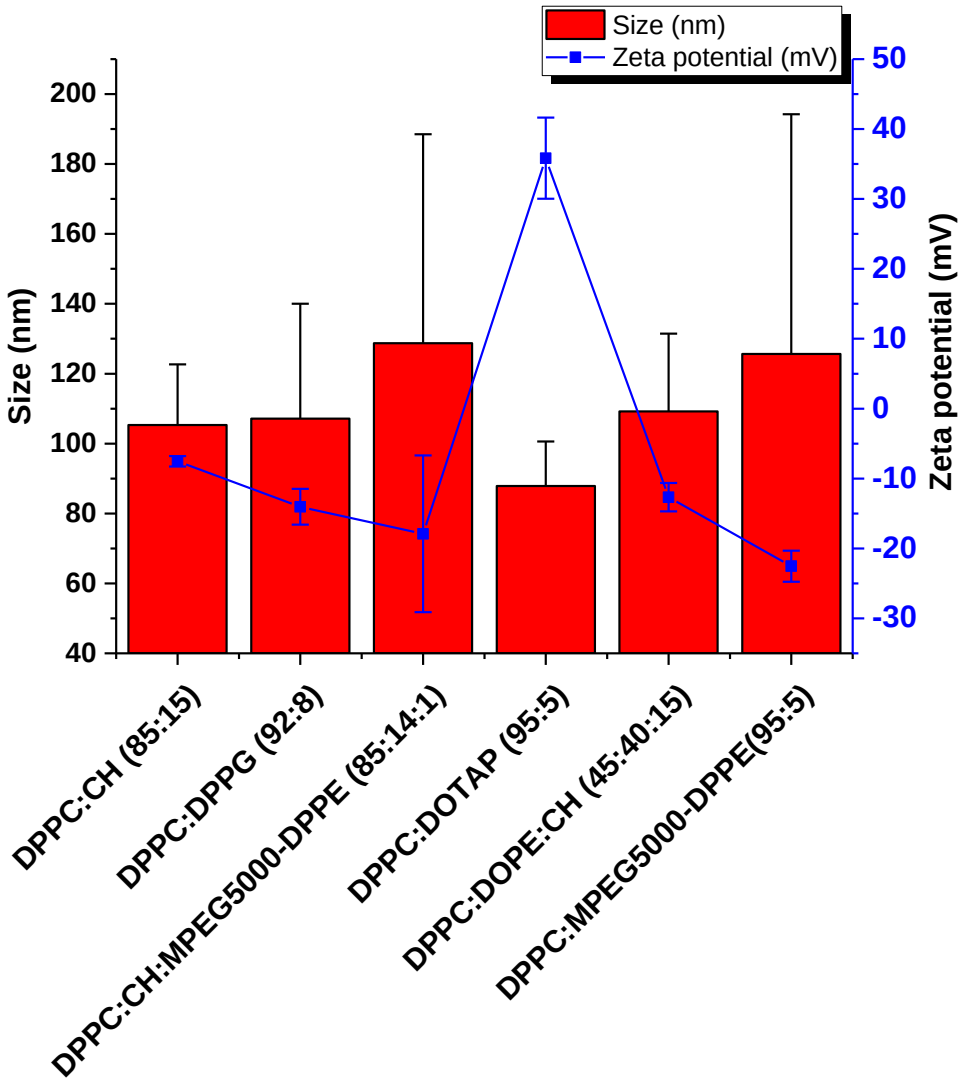
Gel retardation, Fluorescence Quenching and Intensity Size Distribution of Dendriplexes



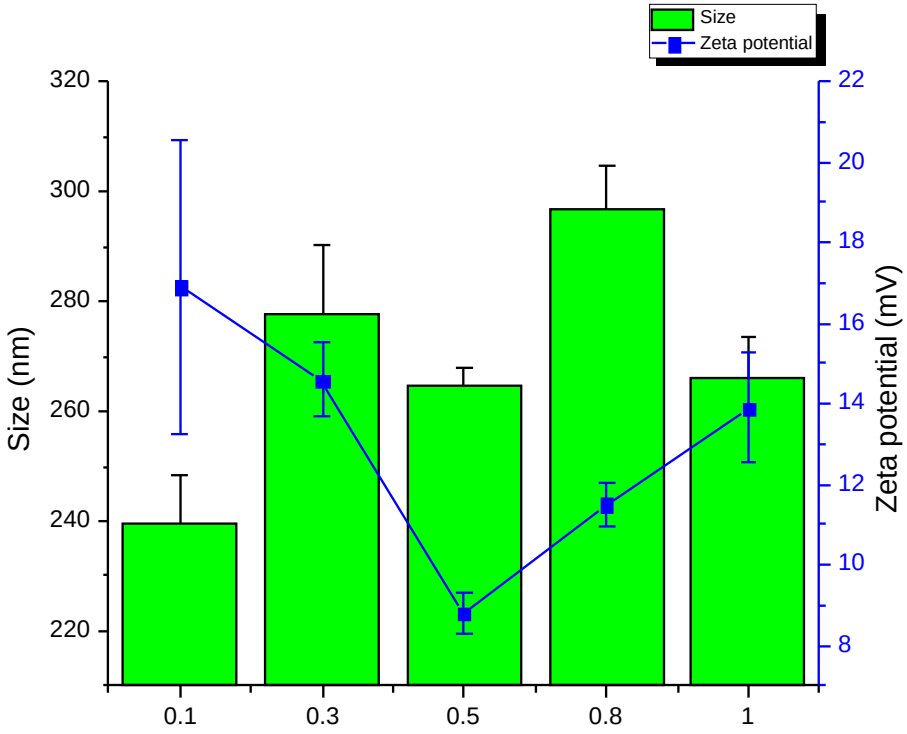


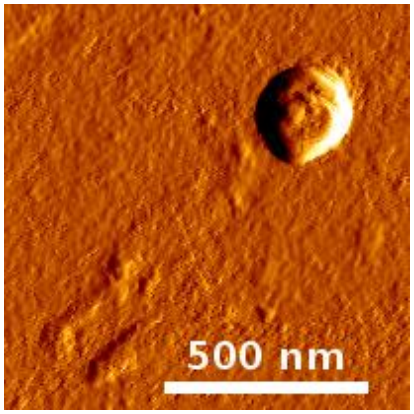


Liposome Formulations

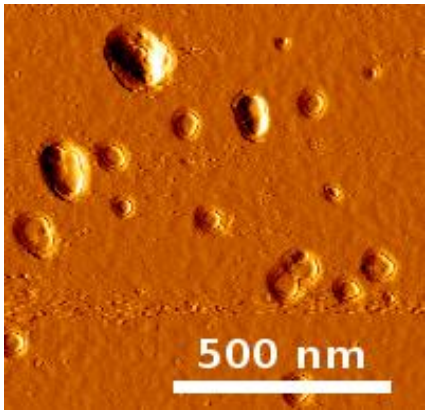


Intensity Size distribution of lipodendriplexes and AFM analysis



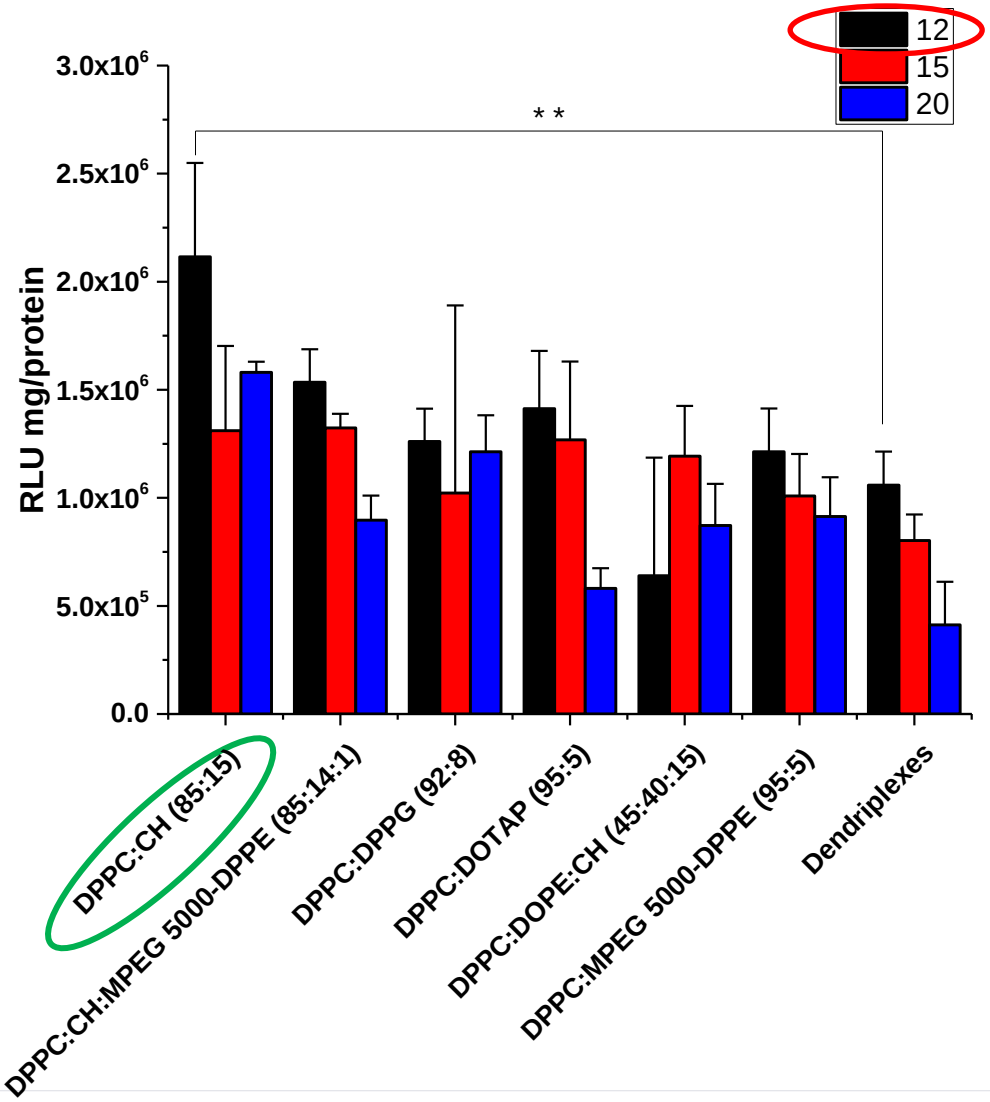


Lipodendriplexes

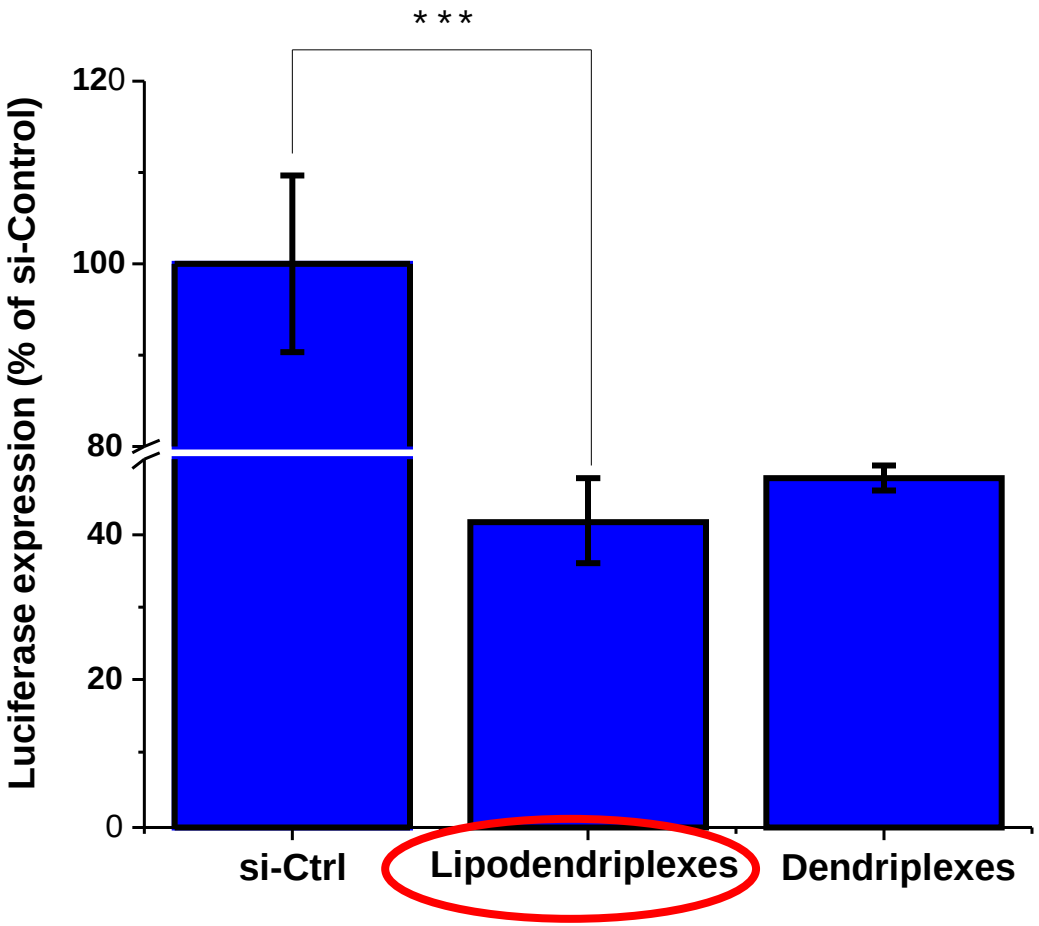


Liposome

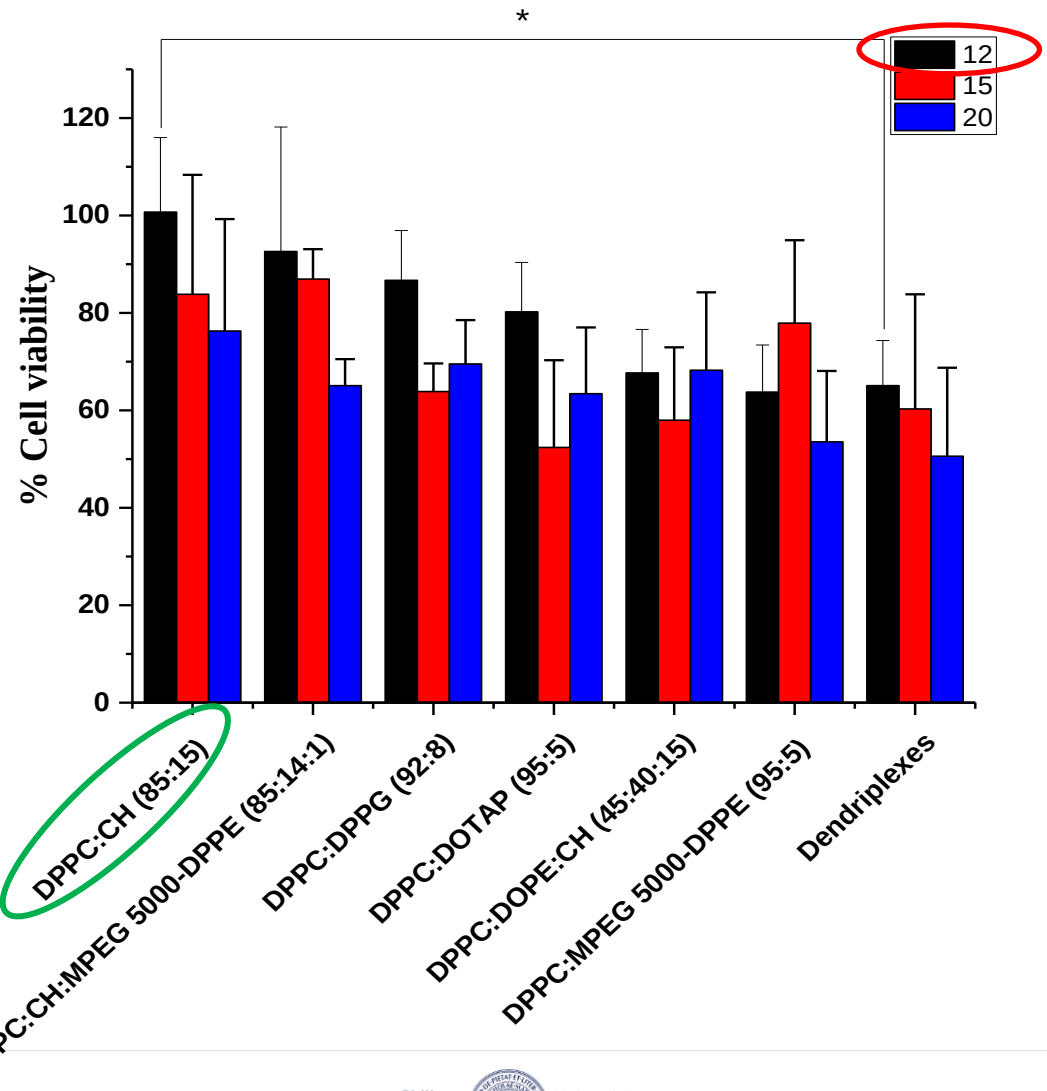
DNA Transfection in SKOV-3



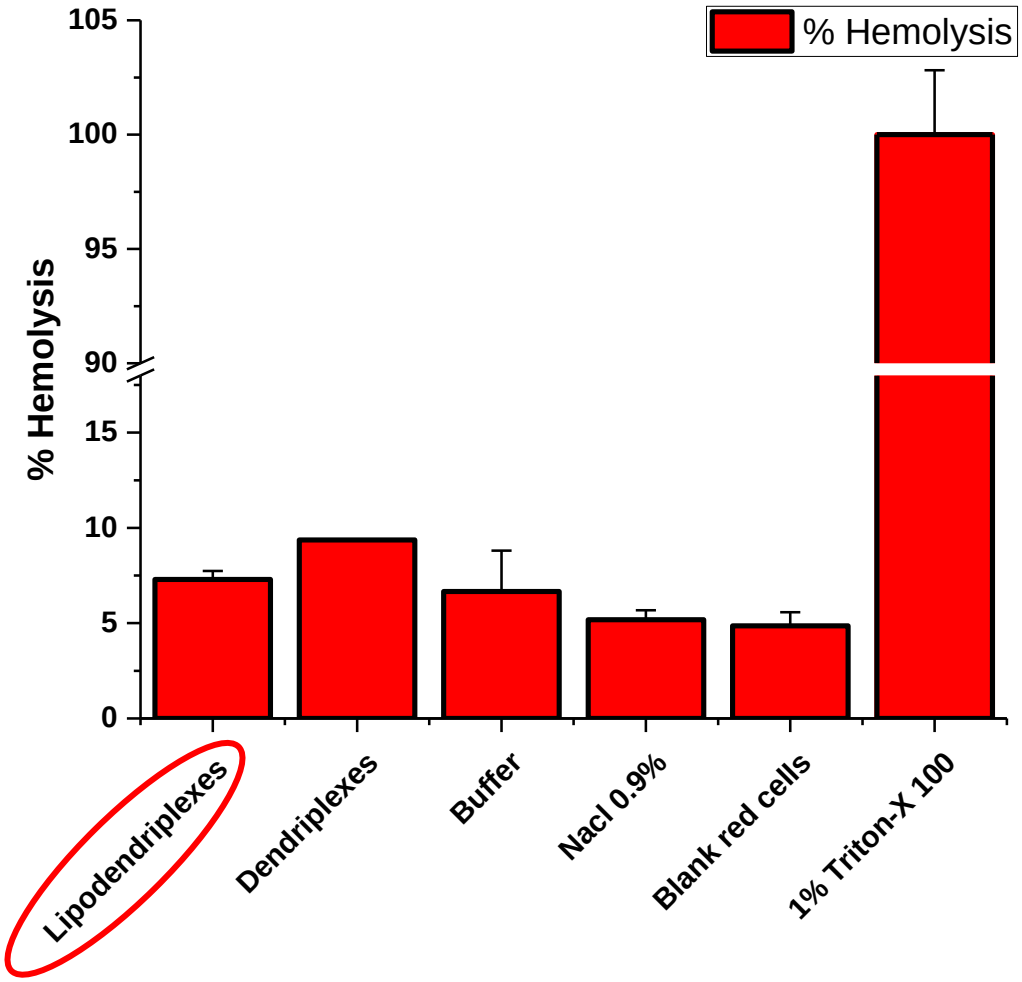
Reporter Gene Knockdown assay



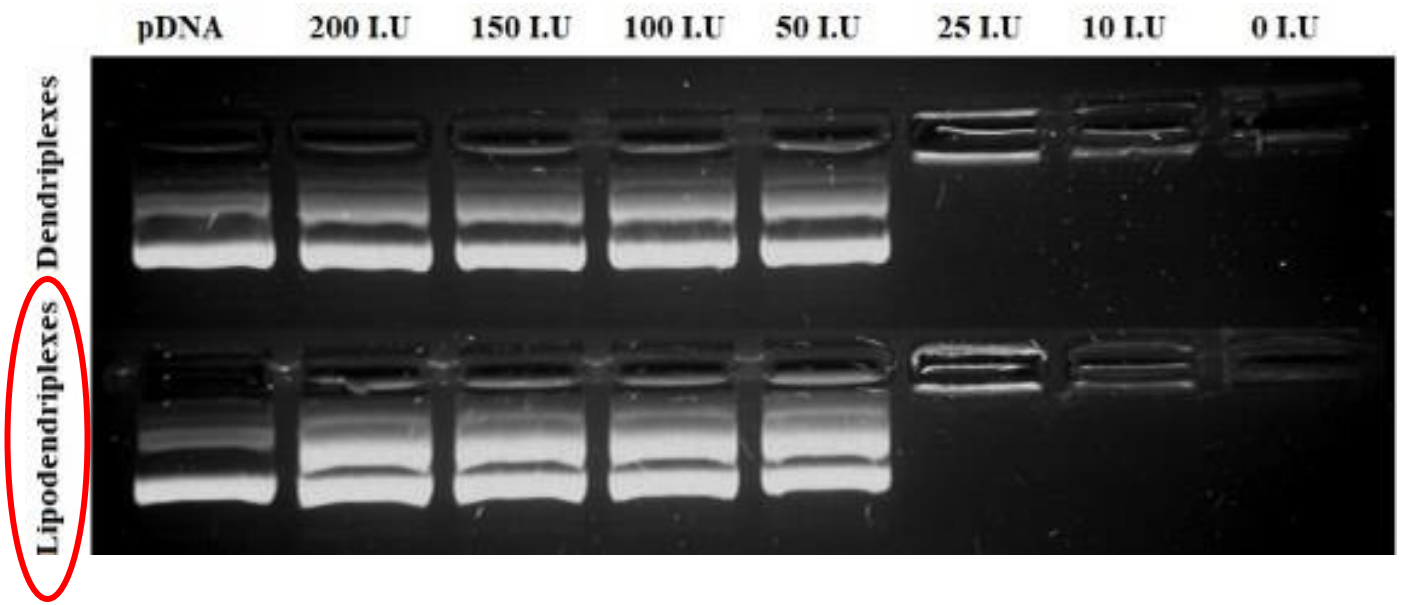
In- Vitro Cytotoxicity Studies



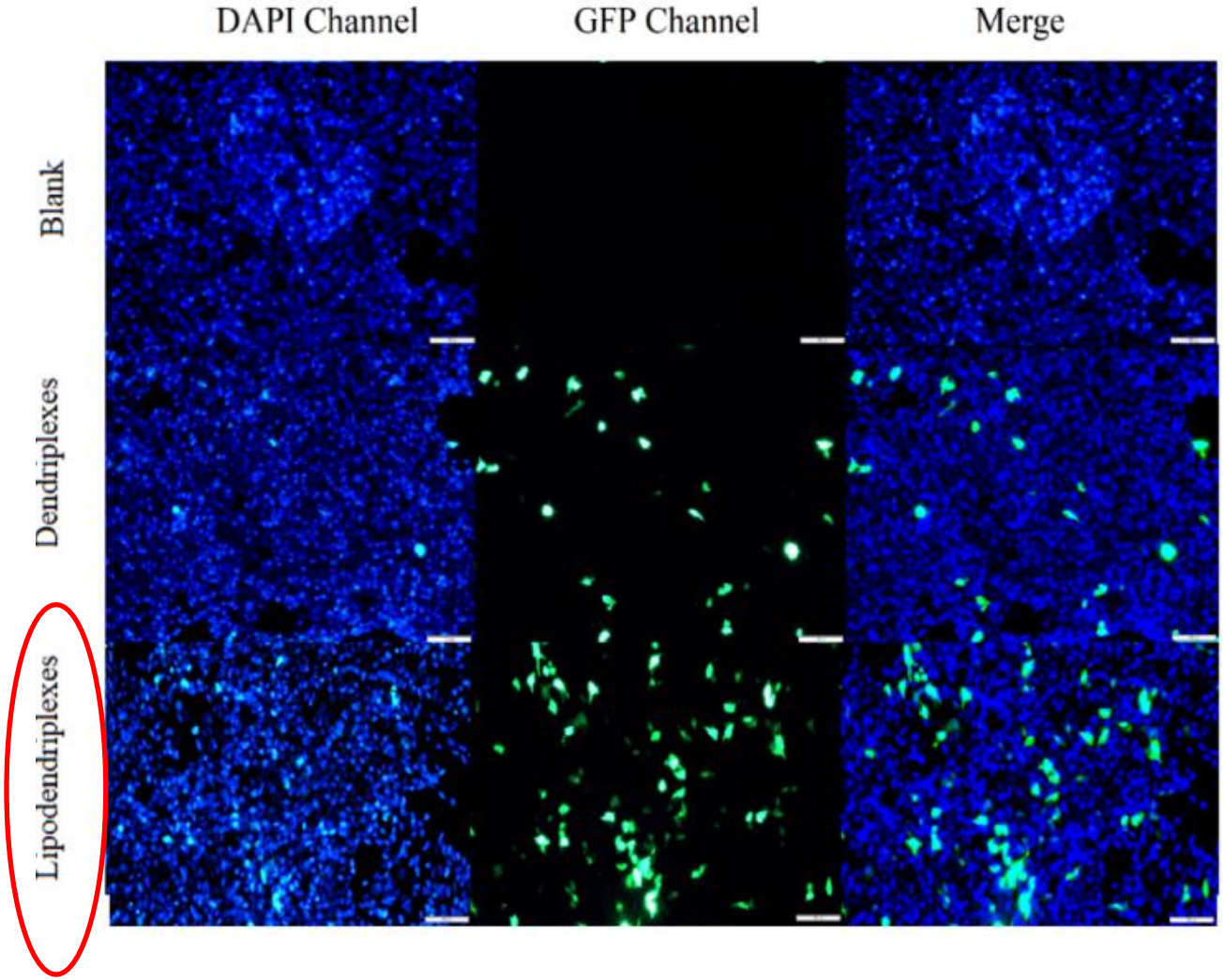
Ex vivo haemolysis assay



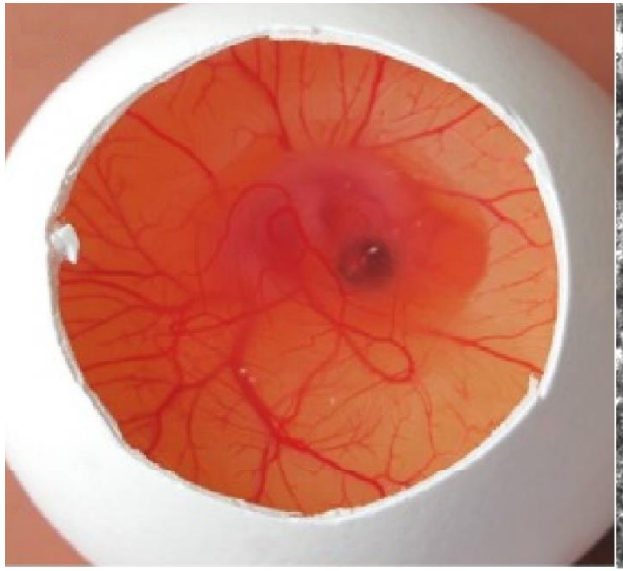
Heparin competition assay



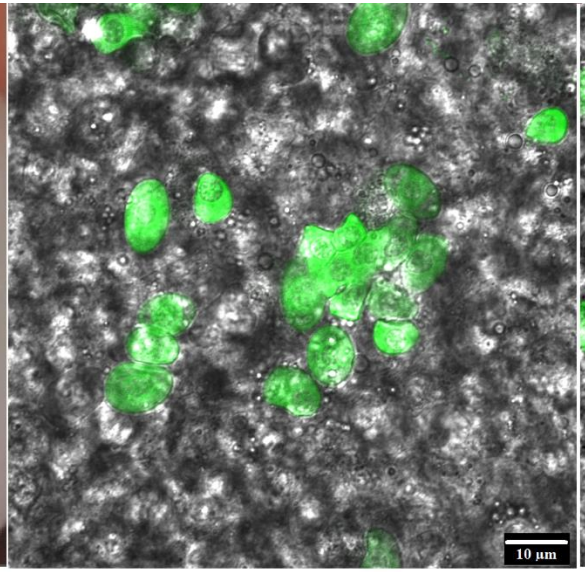
Cellular uptake study (GFP expression)



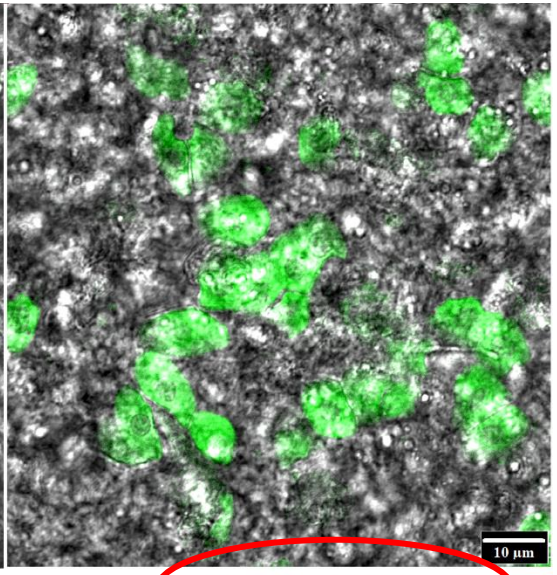
Chronic allantoic membrane (CAM) analysis



CAM



Dendriplexes



Lipodendriplexes

Conclusion

- **Enhance gene transfection with minimum toxic effects on the cells**
- **Hemocompatible**
- **Can be tested for *in vitro*, *in vivo* and *ex vivo* studies**
- **Stable**
- **Cost-effective**

ACKNOWLEDGEMENTS



Prof. Dr. Udo Bakowsky

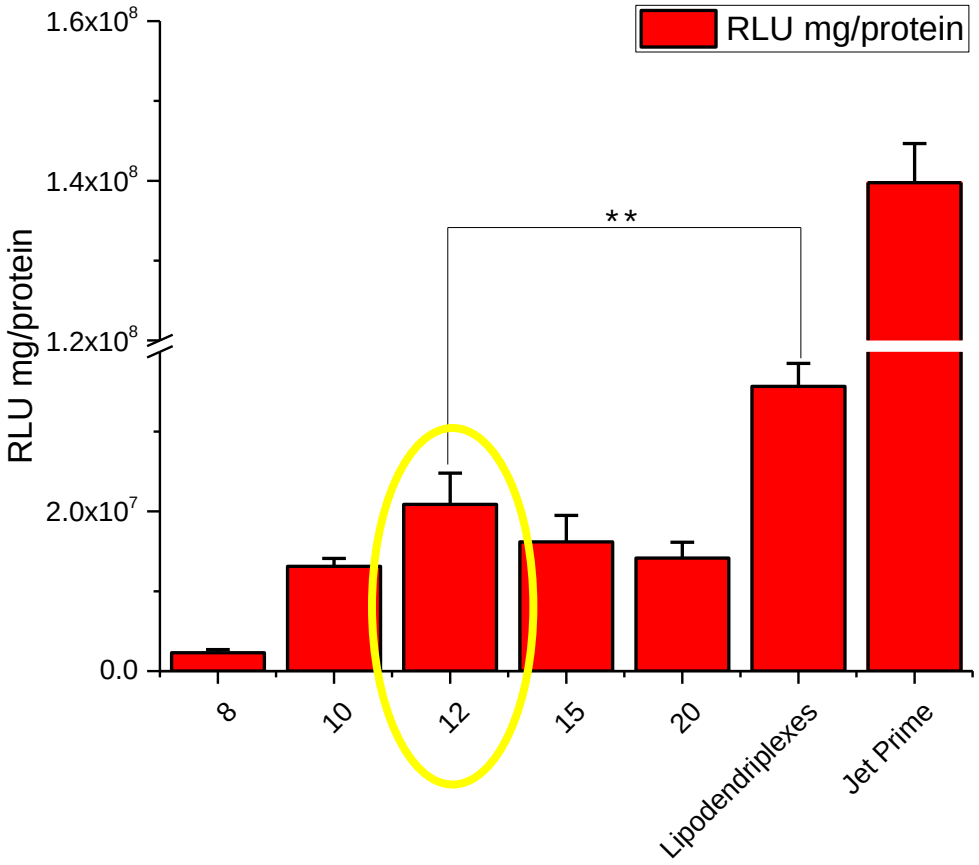
Dr. Jens Schäfer
Mr. Muhammad Yasir Ali
Dr. Shashank Reddy Pinnapireddy

Mrs. Eva M. Mohr

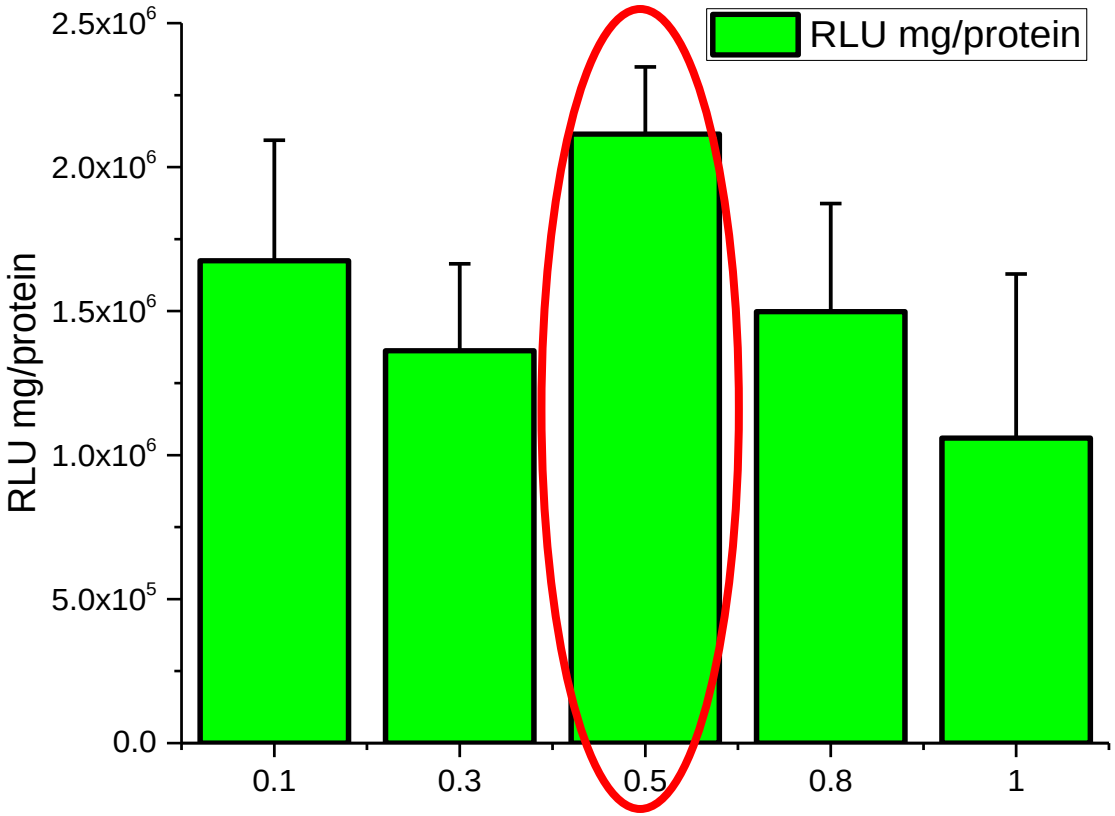
Past and present colleagues of the Department of Pharmaceutics and Biopharmaceutics

THANK YOU FOR YOUR KIND ATTENTION

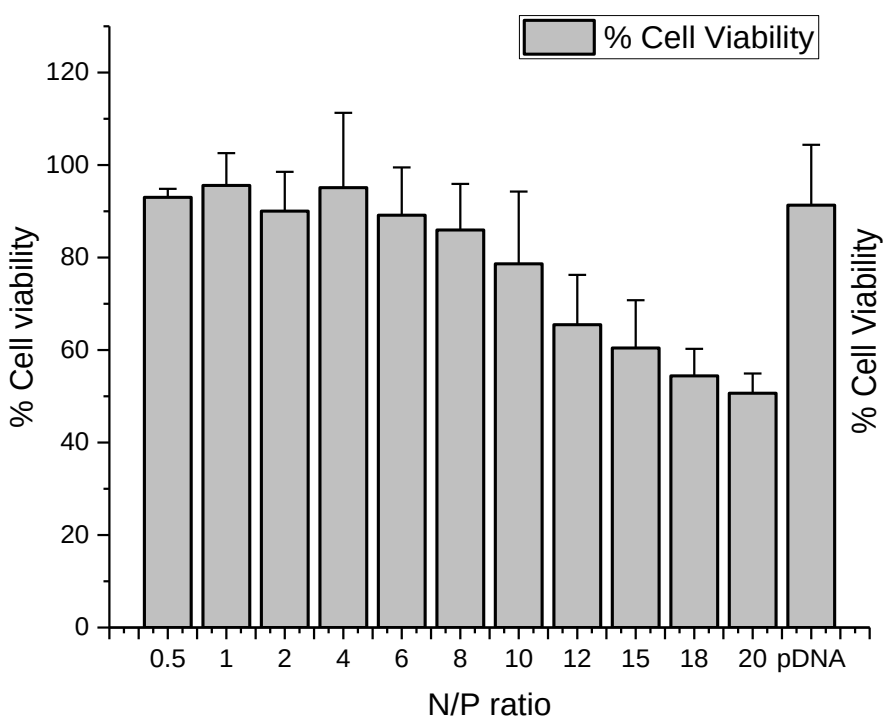
Supplementary data

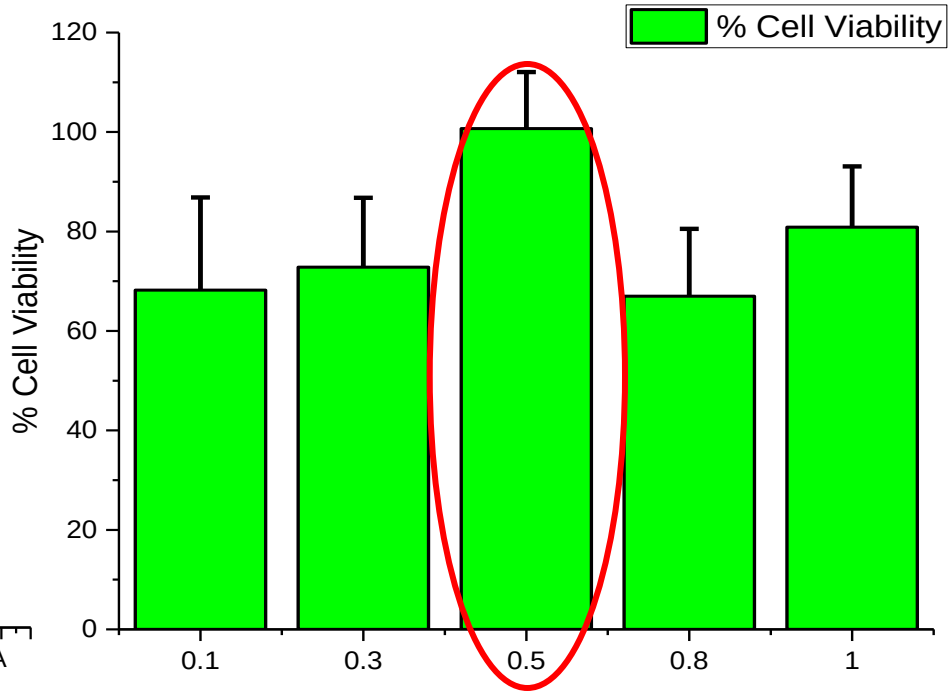


Supplementary data



Supplementary data





Supplementary data

