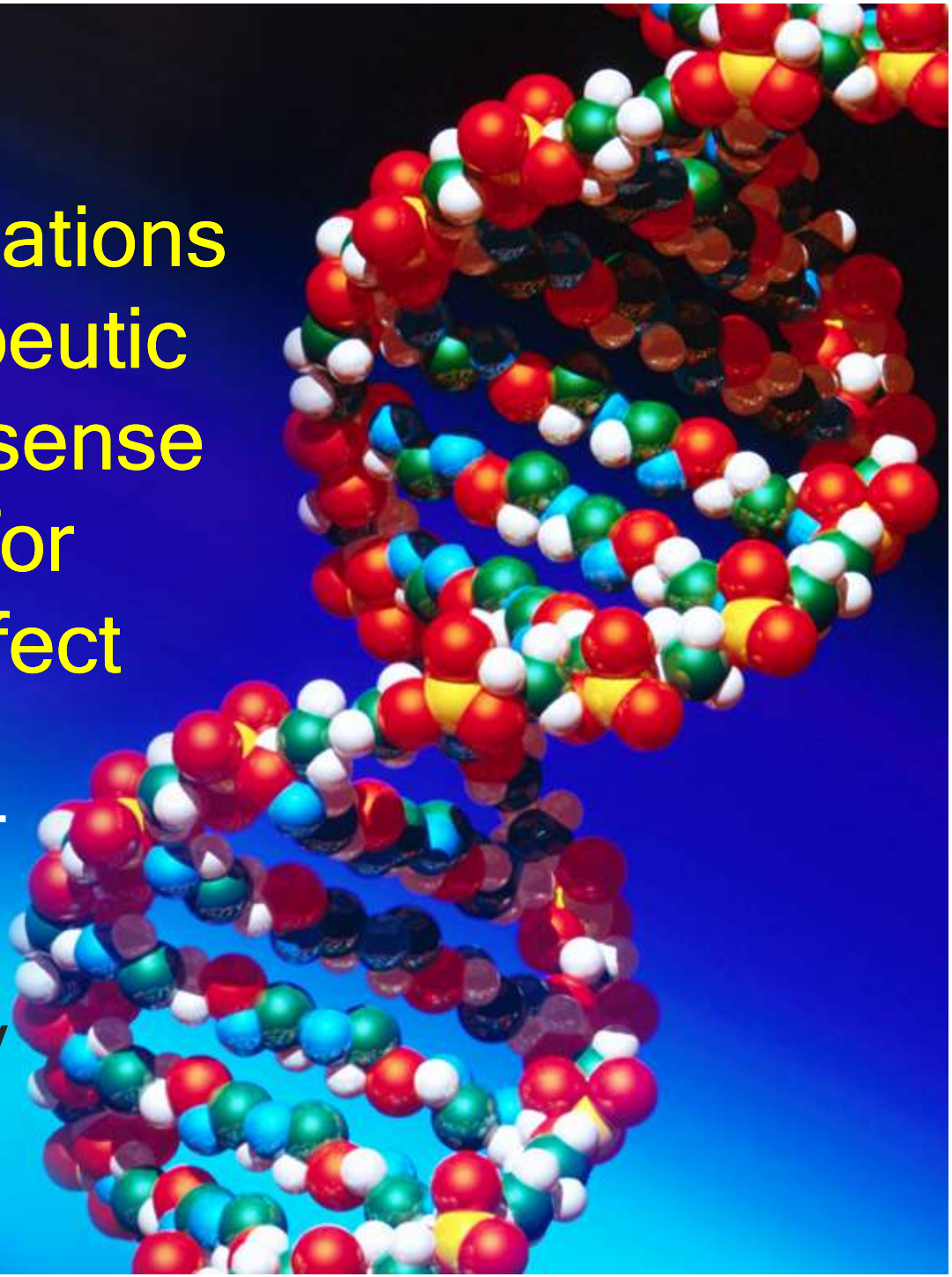
Combined Applications of Chemotherapeutic Agents and Antisense Technology for Synergistic Effect

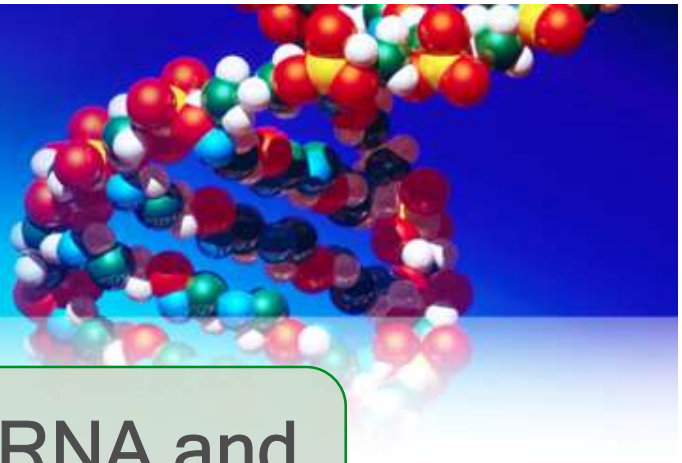


Asist Prof. Behiye ŞENEL

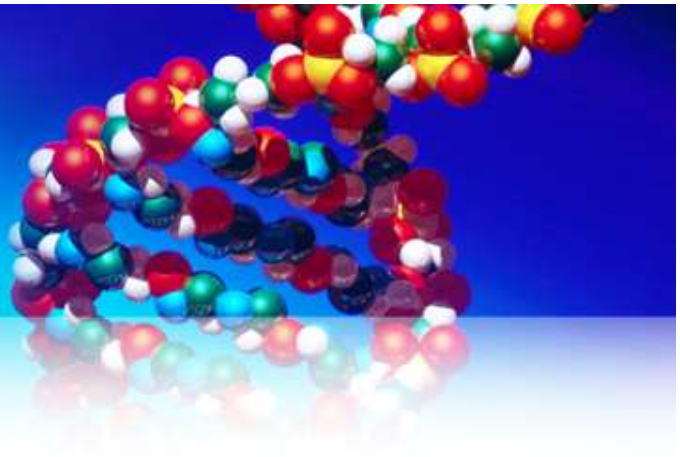
Anadolu University
Faculty of Pharmacy
Pharmaceutical Biotechnology

behiyek@anadolu.edu.tr

OUTLINE

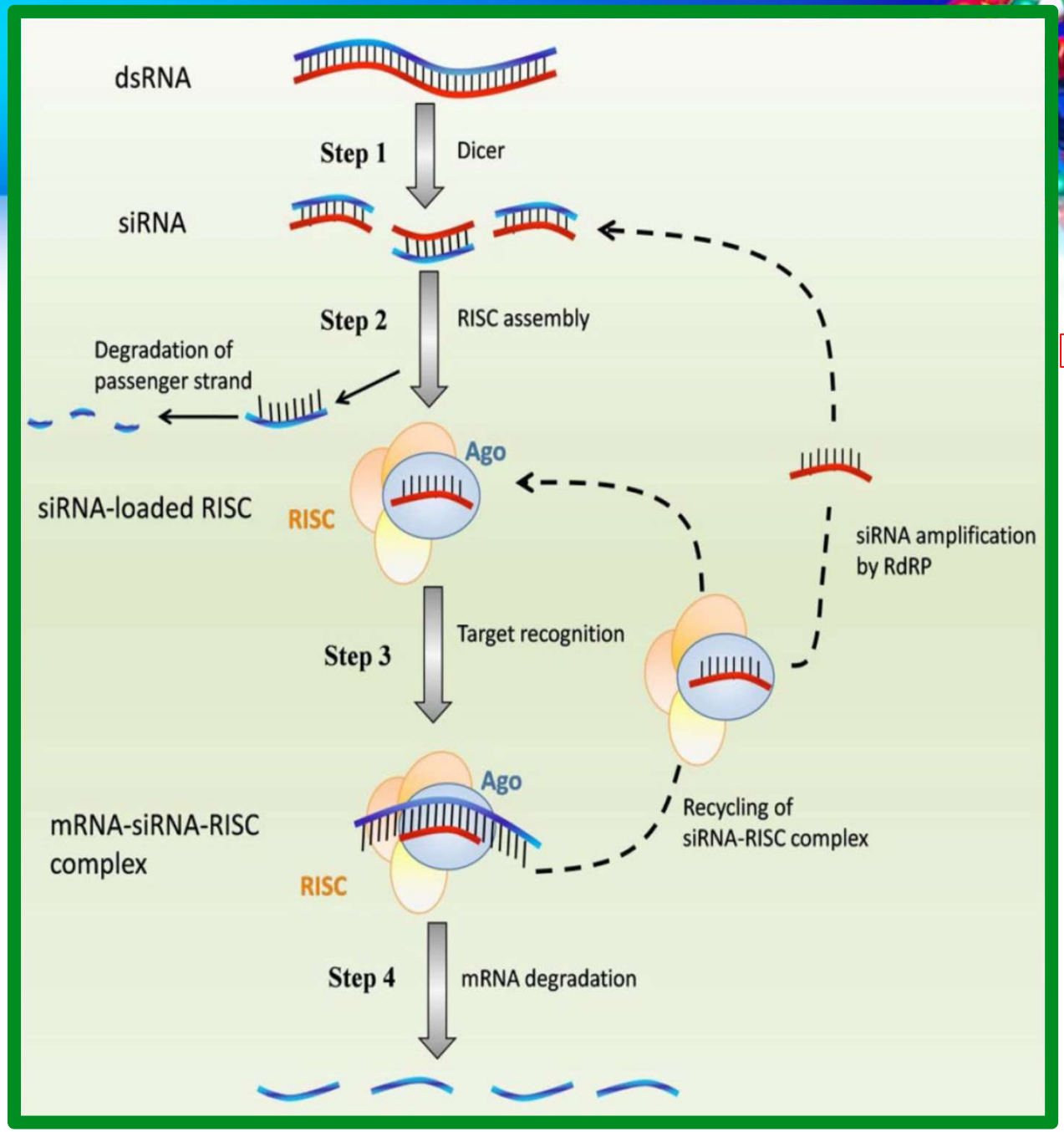


- Antisense Technology/siRNA and chemotherapeutic agents
- Nanocarrier for Gene and Drug Delivery
- Advantages & Disadvantages
- Example of Studies

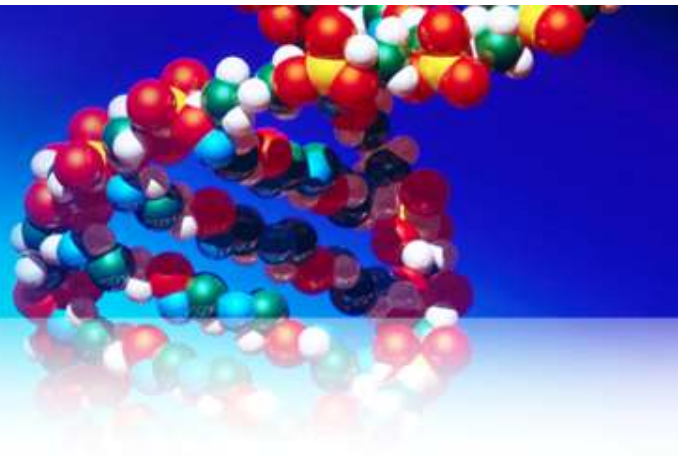


Antisense Technology

siRNA | miRNA | ASO | Ribozyme | Aptamer *etc..*



Cuccato, G.; et al.. *BMC Syst. Biol.* **2011**, *5*, 19.



- HIV
- Ocular
- Respiratory
- Neurological
- Cancer

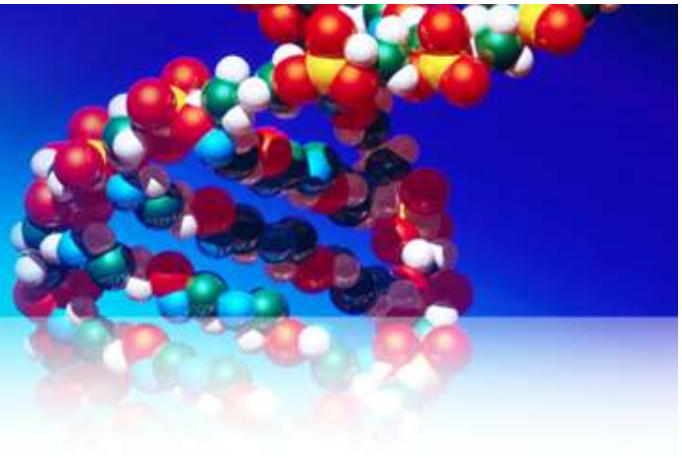
etc...

FDA Approved siRNA theraputics

- Patisiran (2018)
- Givosiran (2019)
- Lumasiran (2020)

Anylam Pharmaceutics

Disadvantages of siRNA



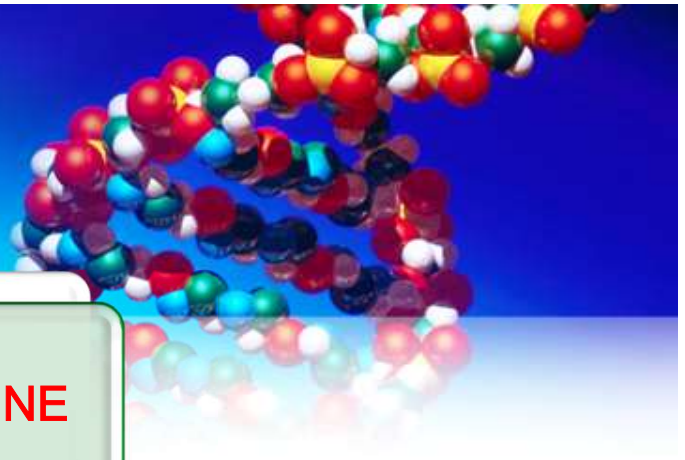
- off-target effects,
- instability in circulation,
- immune stimulation,
- difficulties involving cellular uptake (siRNA hydrophilic and anionic)

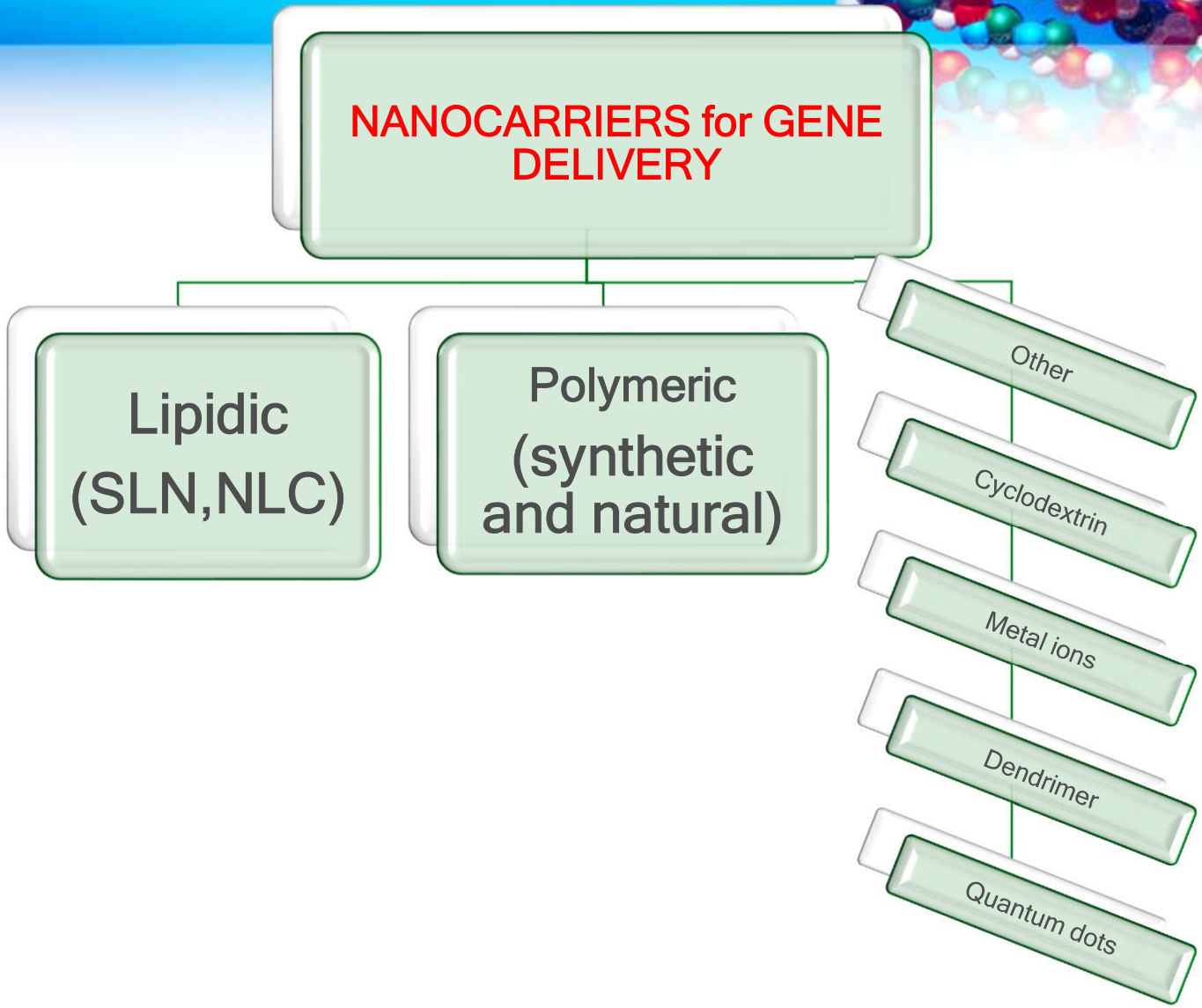
✓Intranasal or Intravitreal

✓Intravenous or subcutaneous

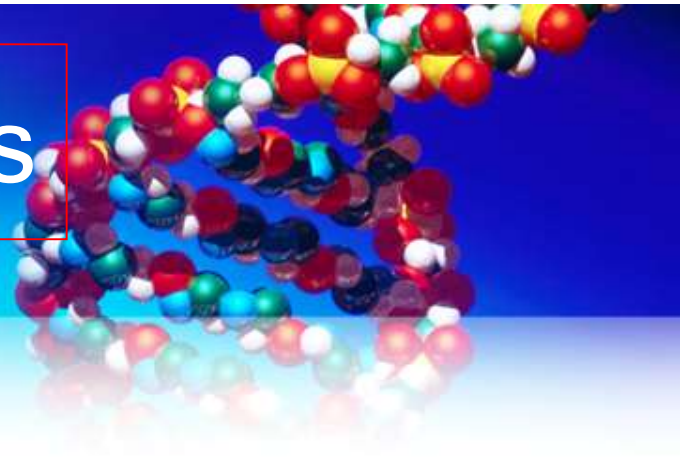


Non-Viral Vectors





Chemotherapeutic agents



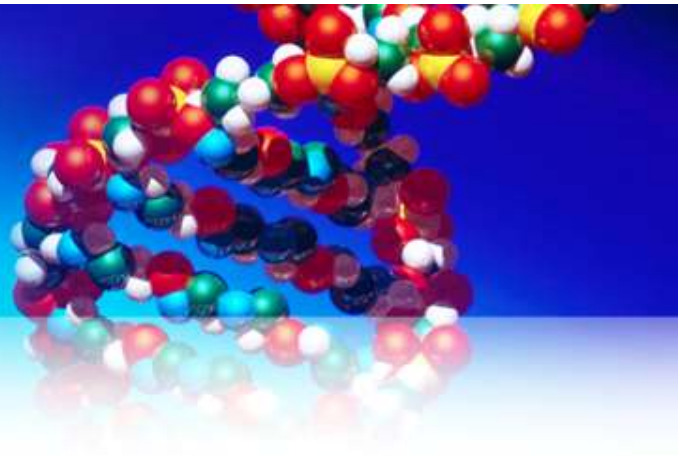
Advantages

- ✓ Chemotherapy may shrink your cancer or slow down its growth, which can help you live longer and feel better.
- ✓ After surgery, chemotherapy may reduce the chances of the cancer coming back.
- ✓ You may have more regular check-ups, tests and contact with your medical team. Some people find this reassuring.
- ✓ For a small number of people with borderline resectable cancer, chemotherapy may shrink the cancer enough to make surgery to remove the cancer an option.

Disadvantages

- ✓ Chemotherapy can cause side effects.
- ✓ You will need to go to the hospital often for treatment, which can be tiring.
- ✓ It affects everyone differently, and may not work so well for everyone.

Co-Delivery of siRNA & Anticancer Drugs



Antisense Tehnology

+

Anticancer Drugs

→

-Apoptosis

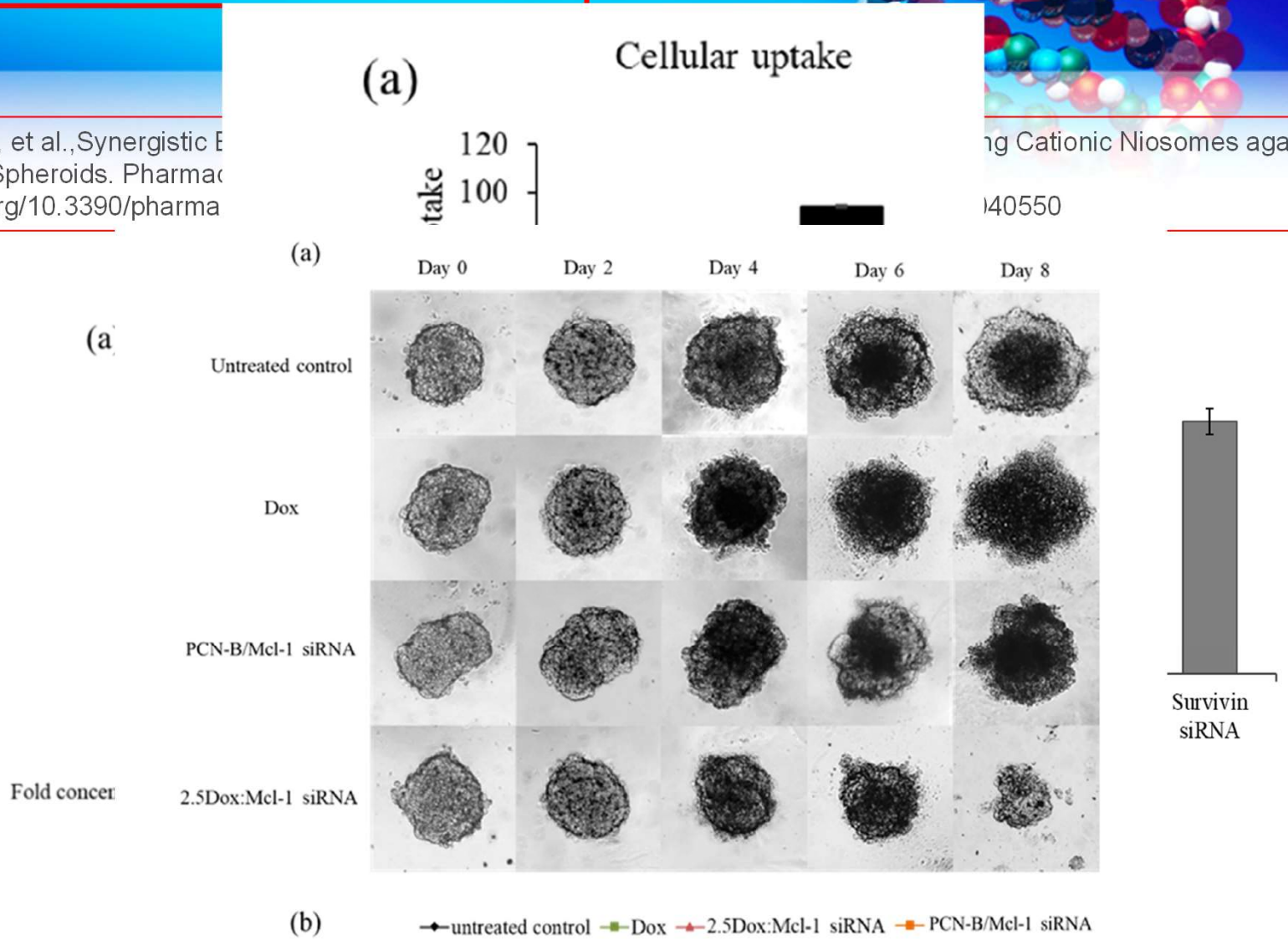
-Protumor

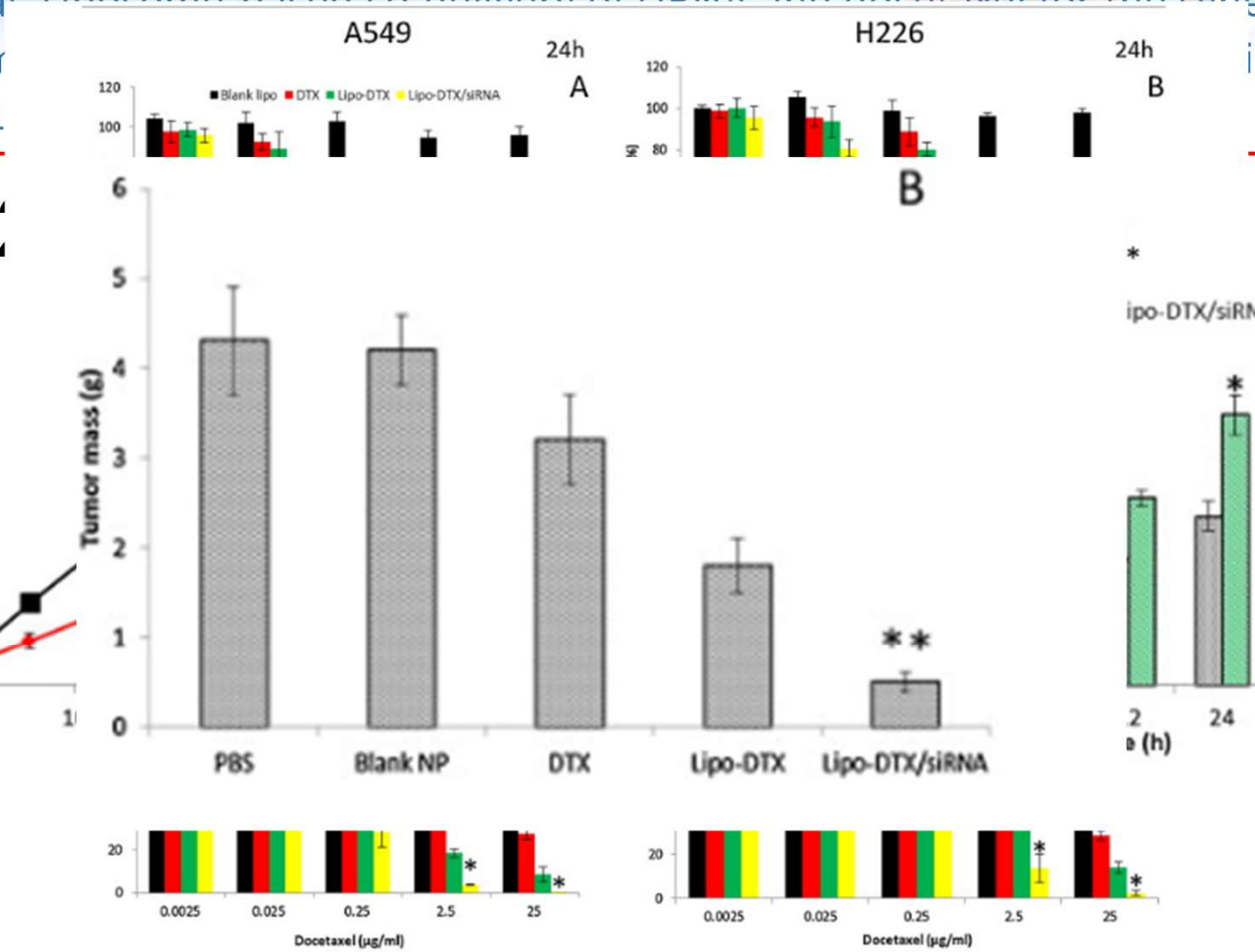
→

- ✓ Improves therapeutic efficacy
- ✓ Decreases untoward effects

STUDIES

Pengnam S, et al.,Synergistic E … ng Cationic Niosomes against 3D MCF-7 Spheroids. Pharmac … https://doi.org/10.3390/pharma …)40550



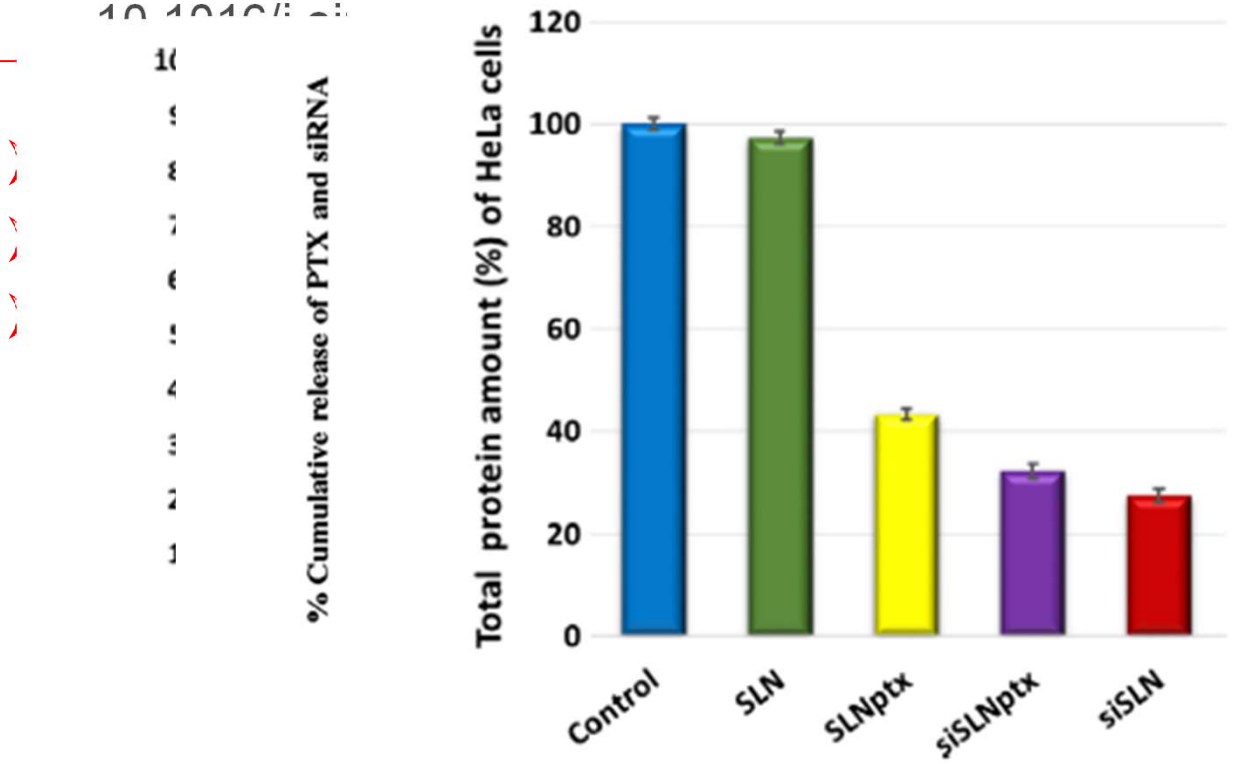


Qu MH, et al. Liposome-based co-delivery of siRNA and docetaxel for the synergistic treatm i: 10.1

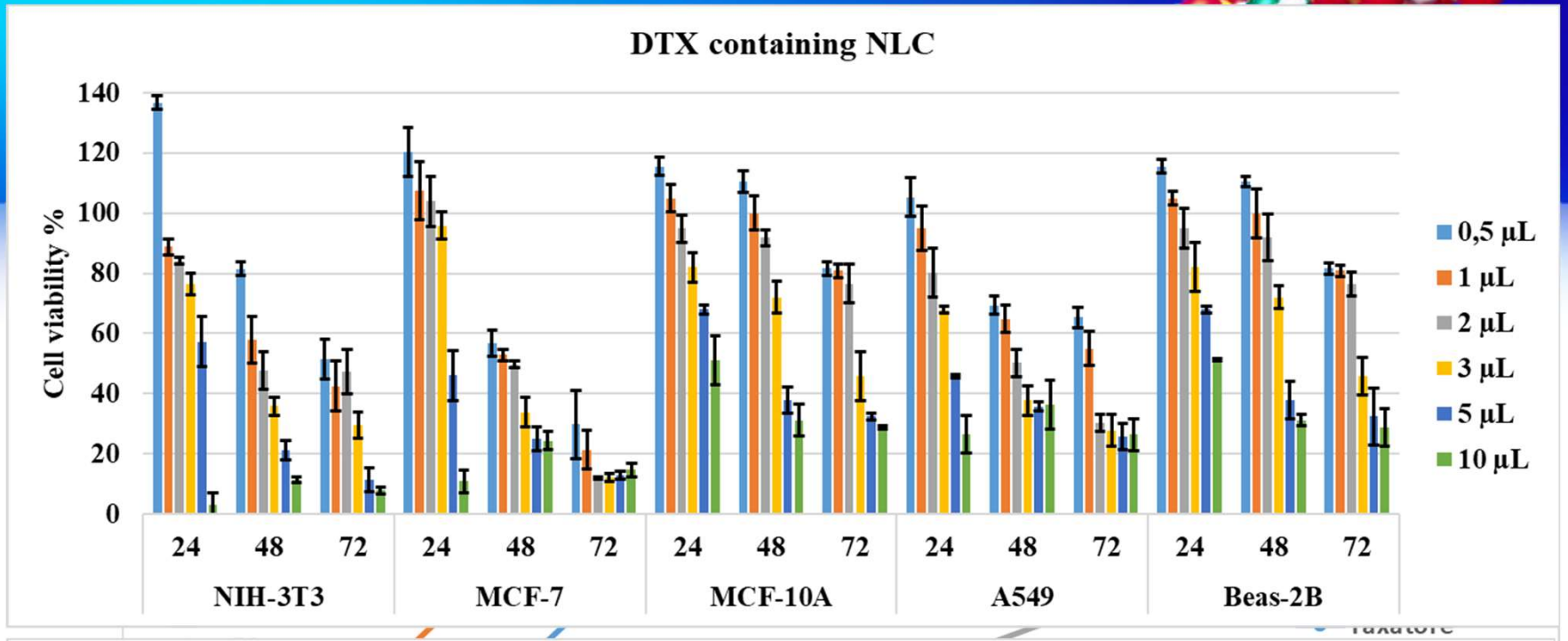
- Bcl-

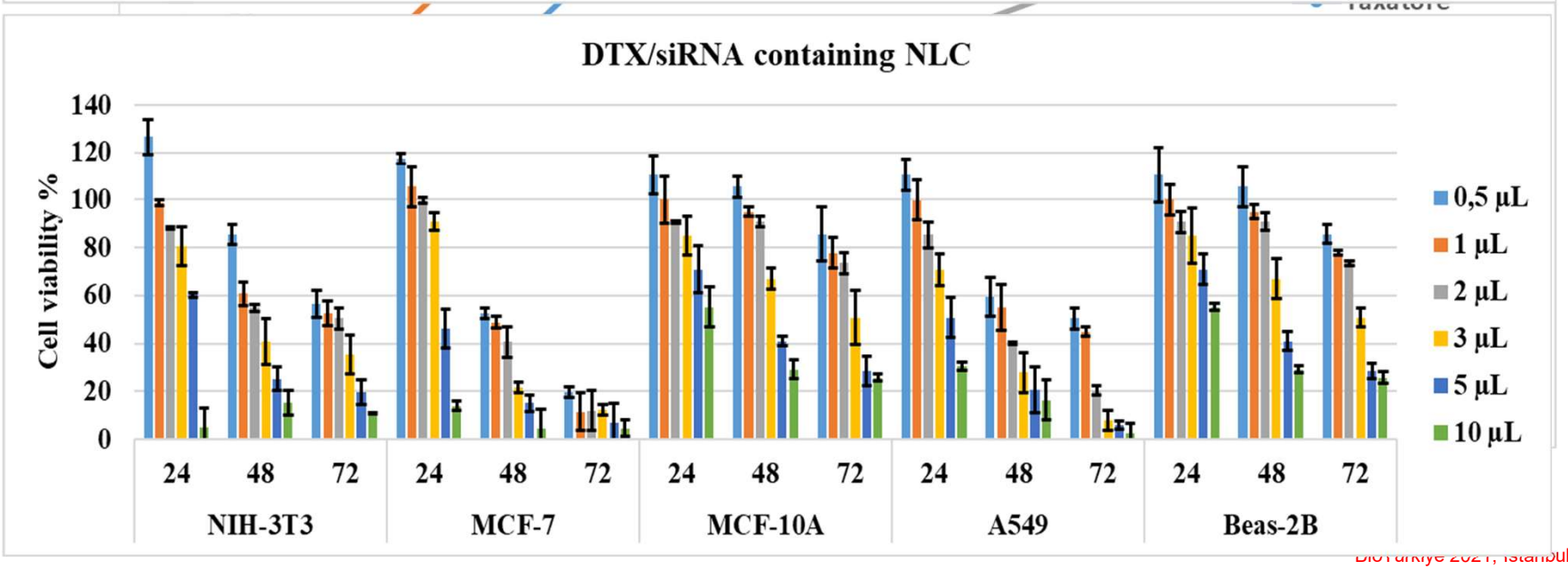
OUR STUDIES

Büyükköroğlu G, Şenel B, et al. Preparation and in vitro evaluation of vaginal formulations including siRNA and paclitaxel-loaded SLNs for cervical cancer. Eur J Pharm Biopharm. 2016 Dec;109:174-183. doi:

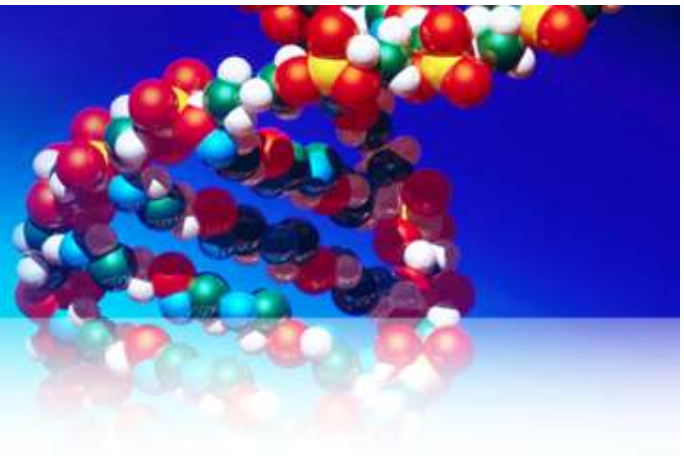


AU-BAP-Proje no:1706S378





Conclusion



- increase chemotherapeutic efficacy
- to reduce drug resistance
- to reduce unwanted side effects
- reduce long-term drug use
- increase patient compliance




City of Eskisehir


Anadolu University

Special thanks to
Assoc. Prof. Dr. Gülay Büyükköroğlu


thank you
danke
merci
gracias
obrigado
dziękuję
bedankt
sukriya
kop khun krap
go raibh maith a
terima kasih
teşekkür ederim
ngiyabonga
спасибо
Баярлалаа
рахмат
謝謝
dank je
mauruuru
hvala
arigatō
grazie
takk
dakujem
mochchak
sagolun
tänan
merci