

Název: **Liposomal Transporter with GFP mark for Targeted Binding using a Nucleic Acid Anchor System**

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Datum: **3.10.2014**

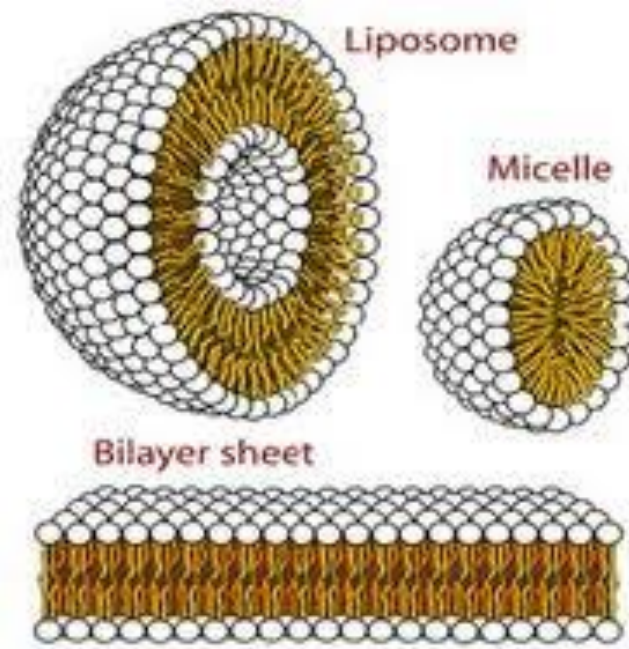
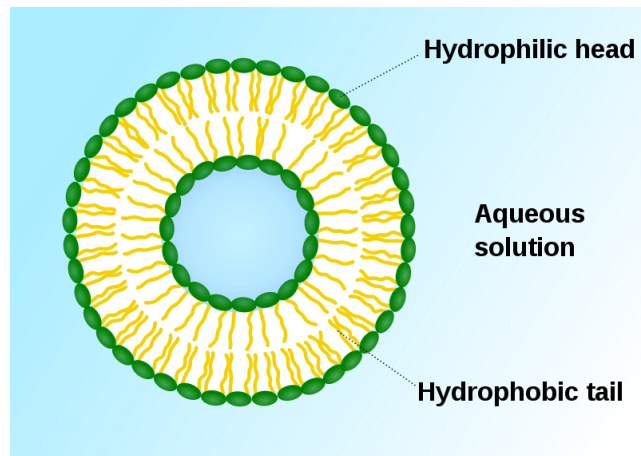
Reg.č.projektu: CZ.1.07/2.3.00/20.0148

Název projektu: Mezinárodní spolupráce v oblasti "in vivo" zobrazovacích technik



# Characteristics of liposomes

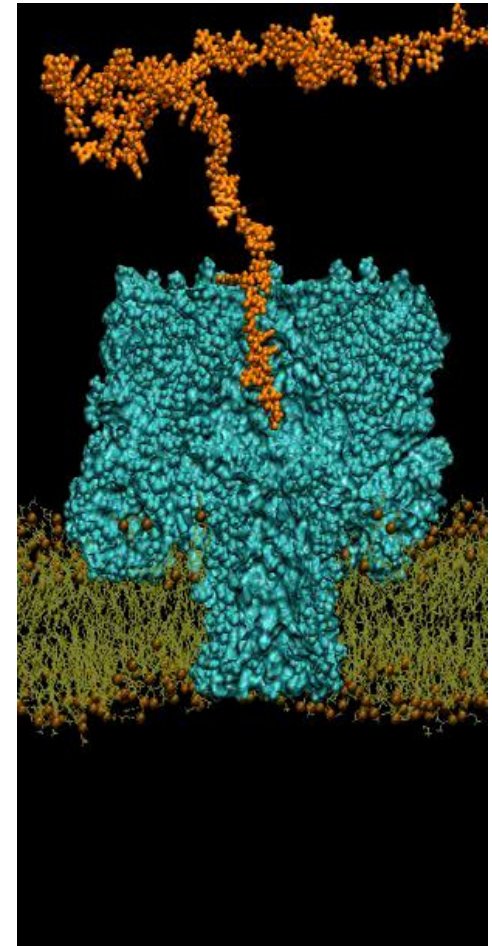
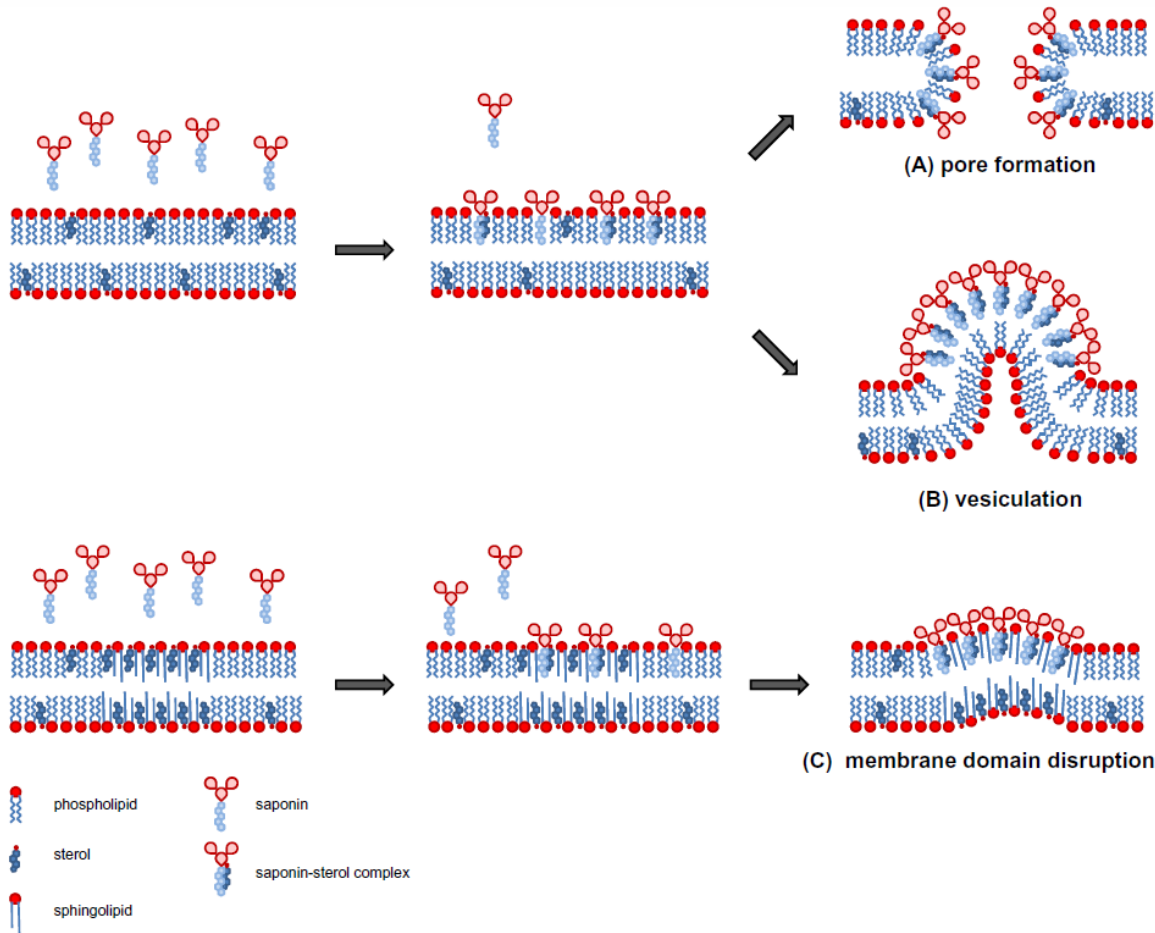
- Liposomes were first described in 1961 by the British hematologist Alec D. Bangham
- Liposomes are spherical phospholipid bilayers



- Liposome diameter can be in the range 100 nm – 5  $\mu\text{m}$

# Use of bilayer sheets

- Model biological membranes
- Transport of substances



# Use of liposomes

## - Transport of Drugs

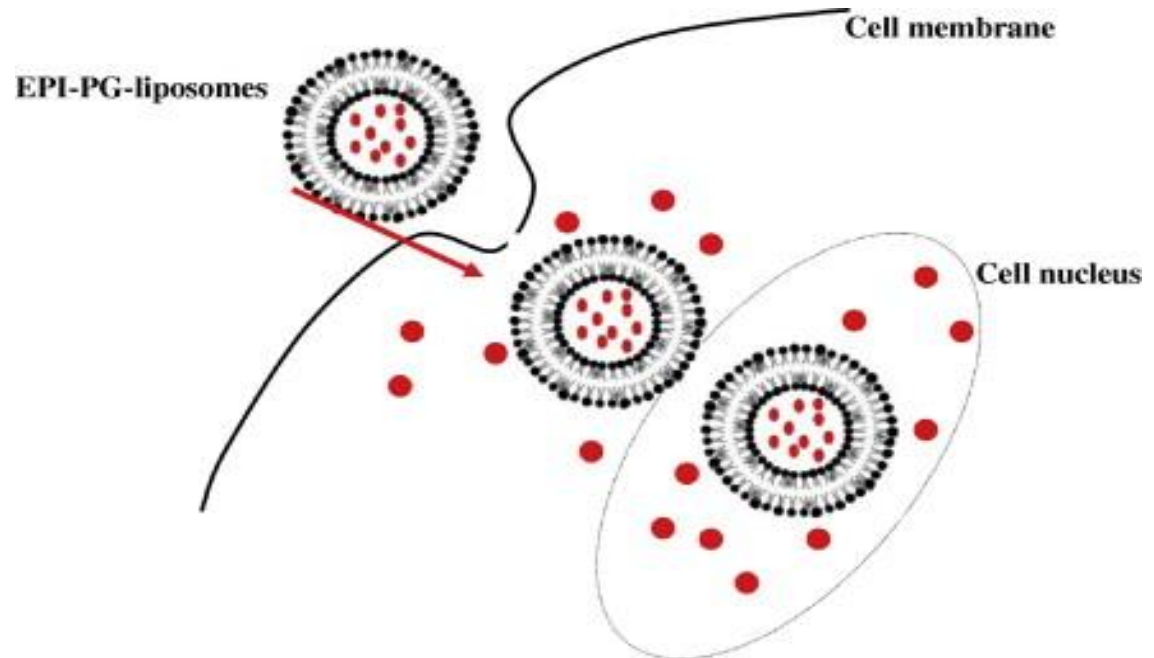
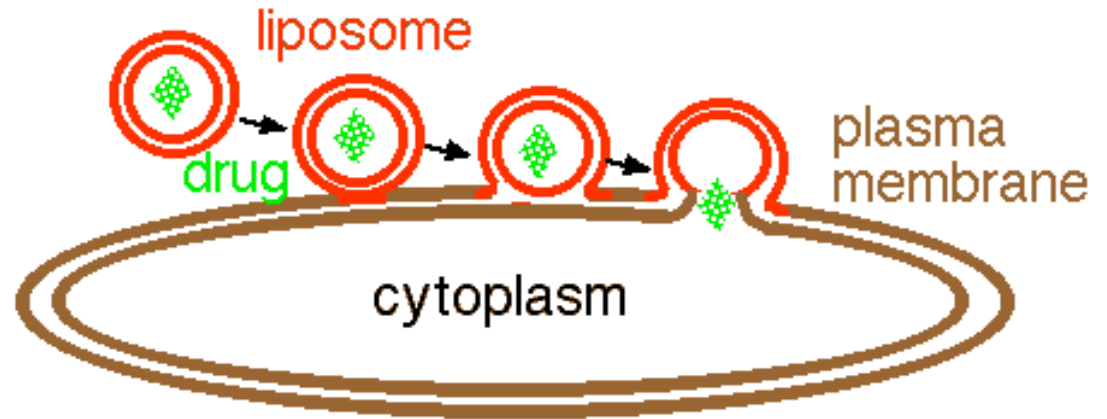
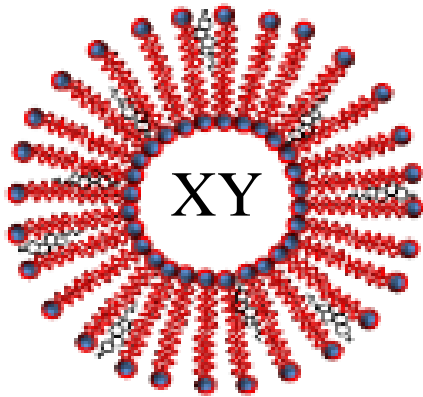
Name	Trade name	Company	Indication
Liposomal amphotericin B	<a href="#">Abelcet</a>	<a href="#">Enzon</a>	Fungal infections
Liposomal amphotericin B	<a href="#">Ambisome</a>	<a href="#">Gilead Sciences</a>	Fungal and protozoal infections
Liposomal cytarabine	<a href="#">Depocyt</a>	<a href="#">Pacira (formerly SkyePharma)</a>	Malignant lymphomatous meningitis
Liposomal daunorubicin	<a href="#">DaunoXome</a>	<a href="#">Gilead Sciences</a>	HIV-related Kaposi's sarcoma
Liposomal doxorubicin	<a href="#">Myocet</a>	<a href="#">Zeneus</a>	Combination therapy with cyclophosphamide in metastatic breast cancer
Liposomal IRIV vaccine	<a href="#">Epaxal</a>	<a href="#">Berna Biotech</a>	Hepatitis A
Liposomal IRIV vaccine	<a href="#">Inflexal V</a>	<a href="#">Berna Biotech</a>	Influenza
Liposomal morphine	<a href="#">DepoDur</a>	<a href="#">SkyePharma, Endo</a>	Postsurgical analgesia
Liposomal verteporfin	<a href="#">Visudyne</a>	<a href="#">QLT, Novartis</a>	Age-related macular degeneration, pathologic myopia, ocular histoplasmosis
Liposome-PEG doxorubicin	Doxil/Caelyx	Ortho Biotech, Schering-Plough	HIV-related Kaposi's sarcoma, metastatic breast cancer, metastatic ovarian cancer
Micellular estradiol	<a href="#">Estrasorb</a>	<a href="#">Novavax</a>	Menopausal therapy

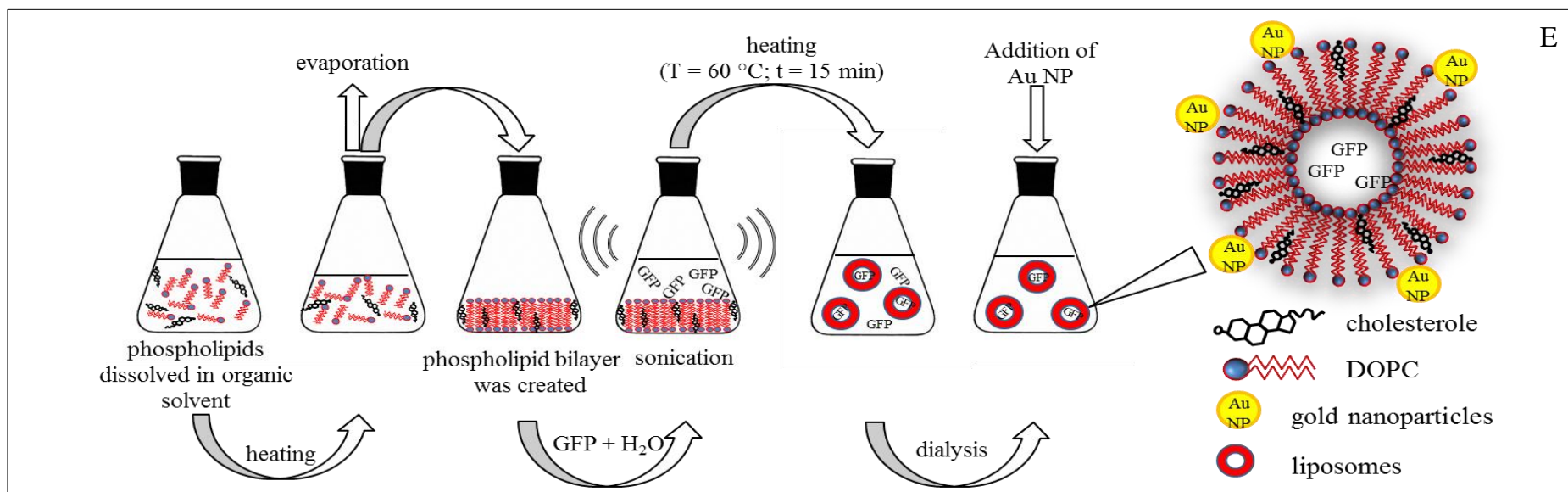
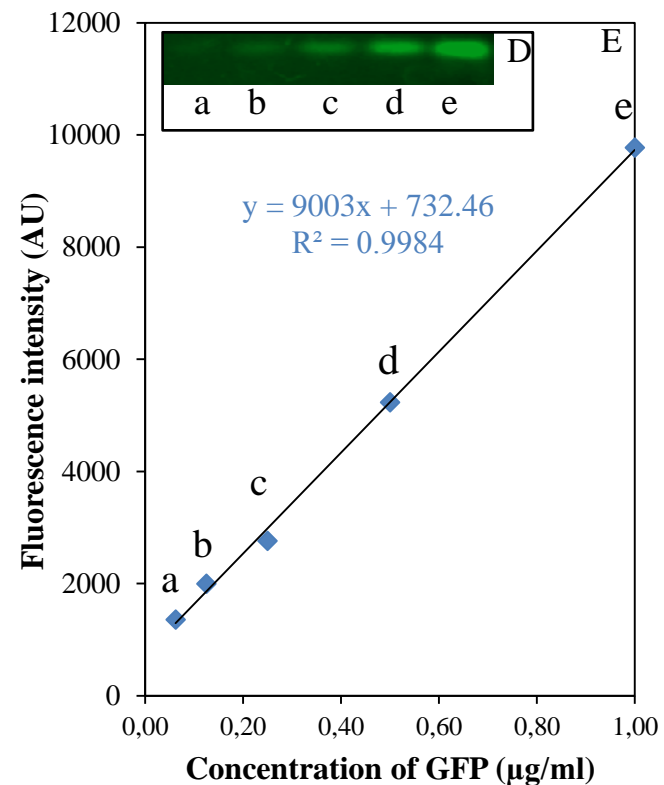
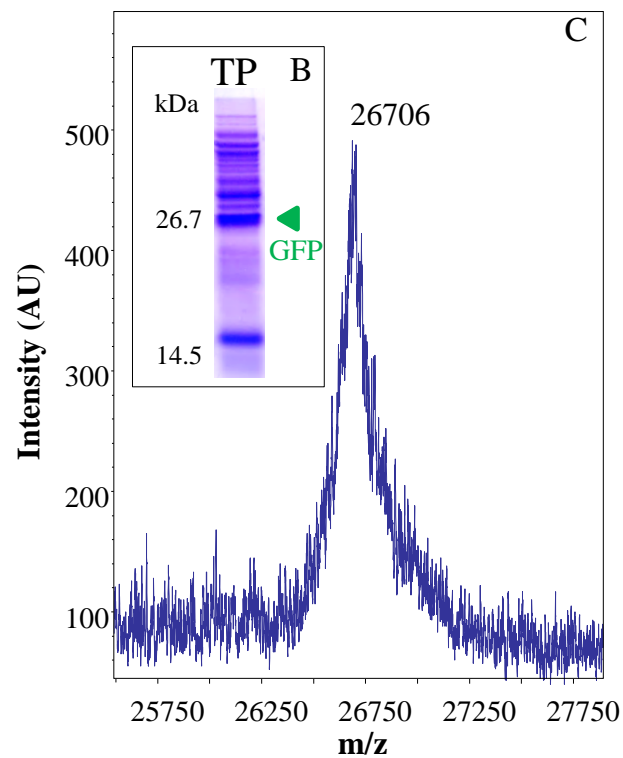
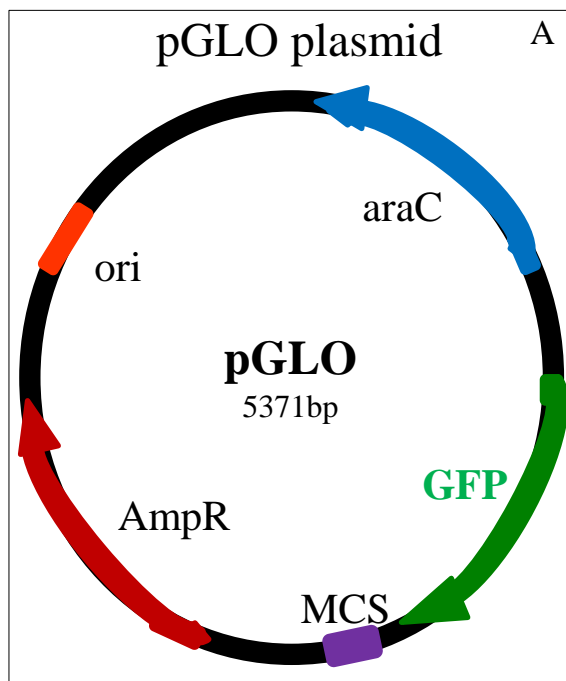
# Biocompatibility

- 1) Liposomes are combined with the cell via membrane phospholipid
- 2) Liposome gets into cells via endocytosis

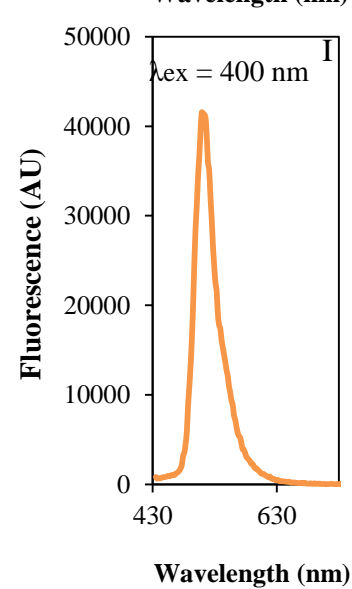
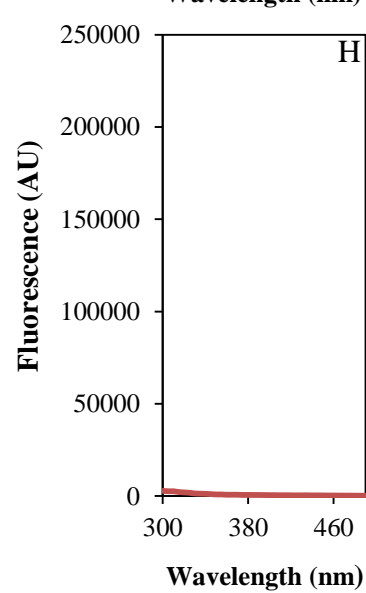
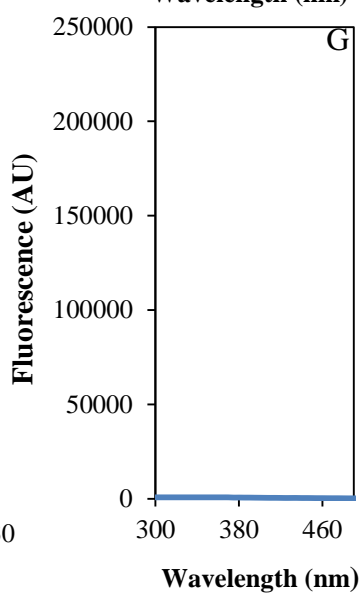
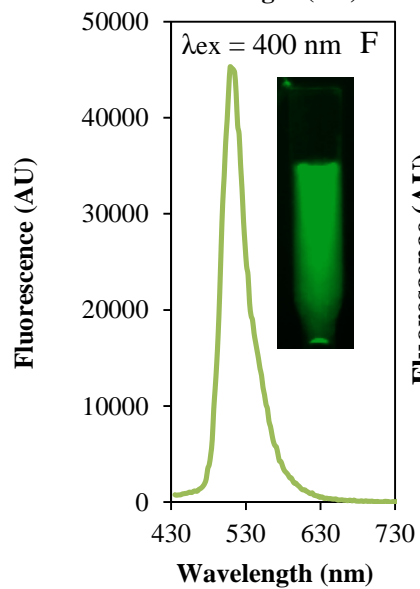
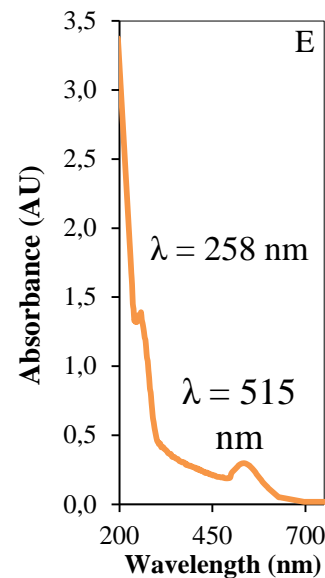
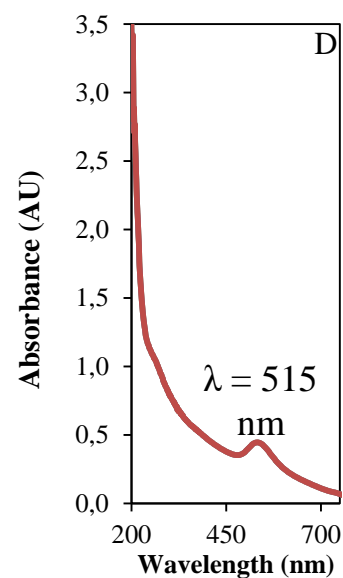
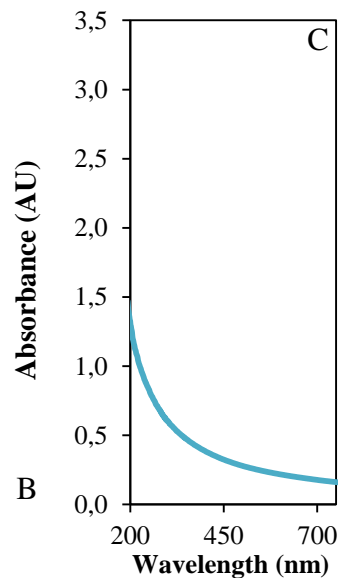
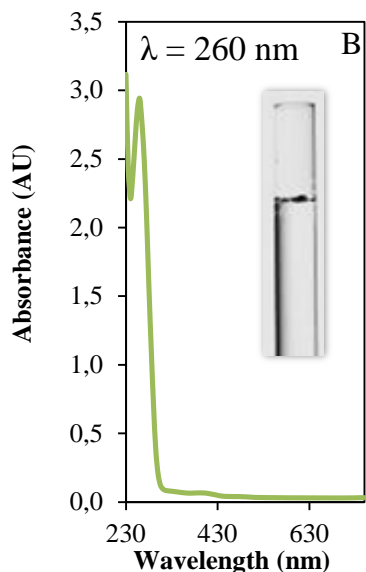
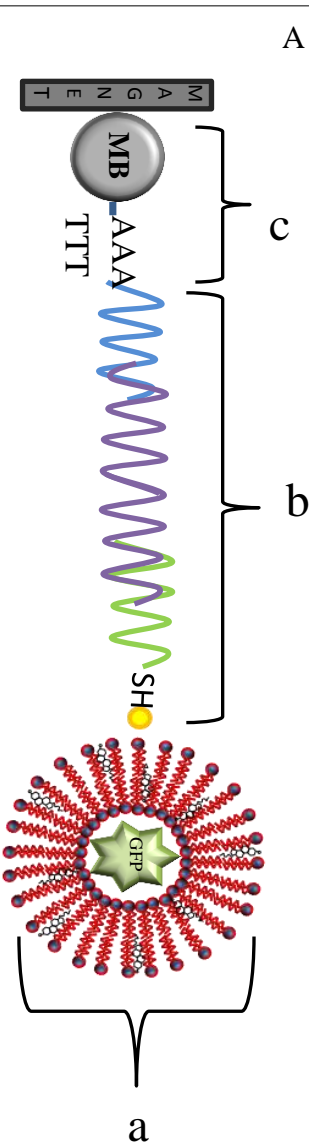
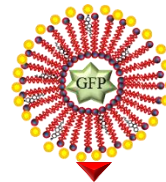
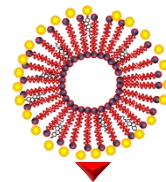
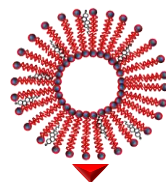
## Modification of the liposome

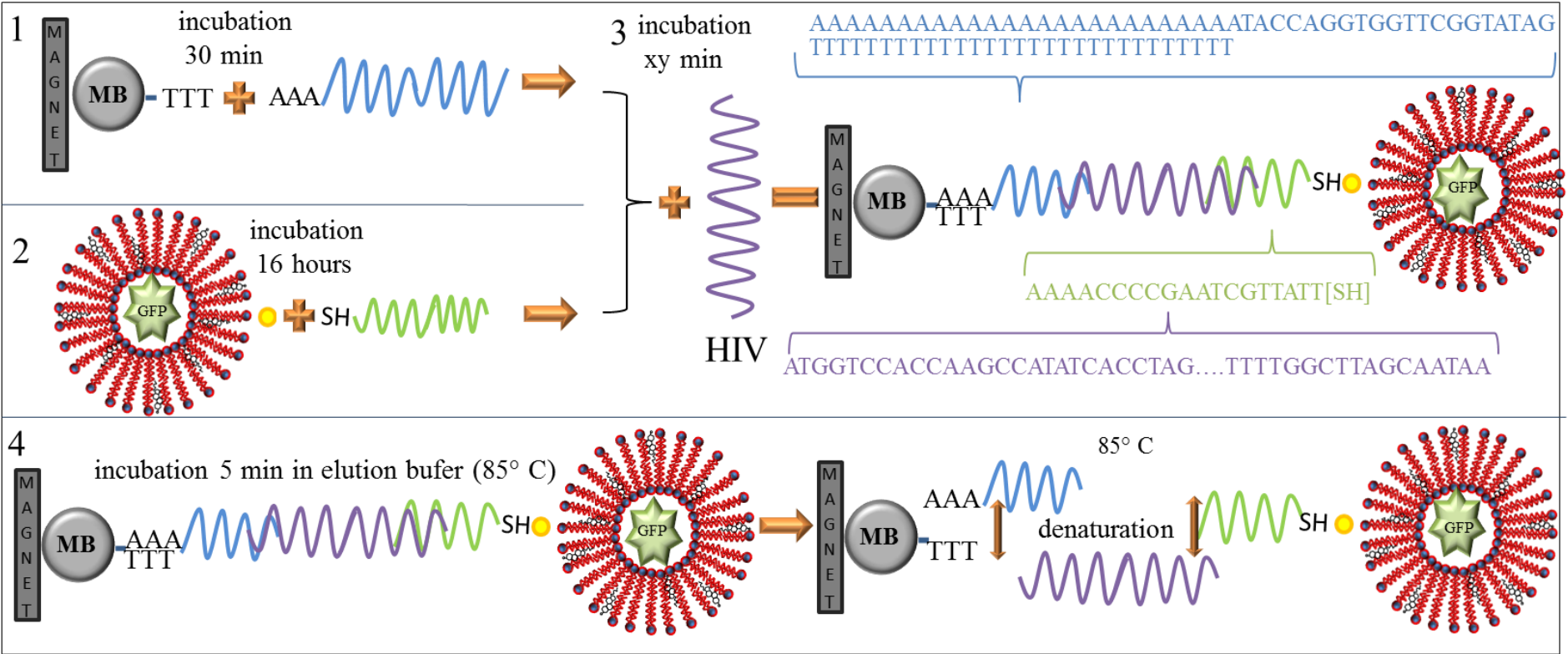
XY = drugs, proteins, DNA, enzymes, and metal ions













# Conclusion

- Liposomes are intensively studied molecules
- Their use involves the transport of substances and membrane studies
- In this experiment we have succeeded in creating modular nanodevice with targeted binding of HIV gene

# Acknowledgment

## Grant agency

Financial support from the following projects  
NANOLABSYS CZ.1.07/2.3.00/20.0148 is  
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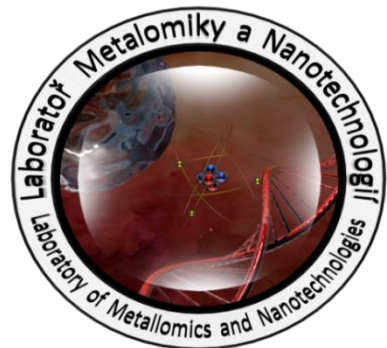


Mezinárodní spolupráce v oblasti  
"in vivo" zobrazovacích technik

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**Thank you for your attention**

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in Brno

