

## **Assignment#5, Fundamentals in BioPhotonics**

1. What is super-resolution microscopy?
  - a. Which two classes of super-resolution techniques exist? How are they different from scanning probe microscopies?
  - b. Explain main differences between STED and PALM/STORM techniques
2. What are the crucial properties of fluorescent probes for super-resolution SMLM? What are important factors affecting the quality of STORM/PALM images?
3. Sketch an object to be imaged by SMLM and apply the abovementioned factors to get the worst and best resolution of this object.
4. How is resolution defined/measured/estimated for SMLM?
  - a. How is it different from localization precision?
  - b. Which metric is more important for the image quality and why?
  - c. What are some artefacts that can appear in SMLM images?
5. How the Moiré effect was used to improve the optical resolution? What are the advantages of SIM in comparison to SMLM?