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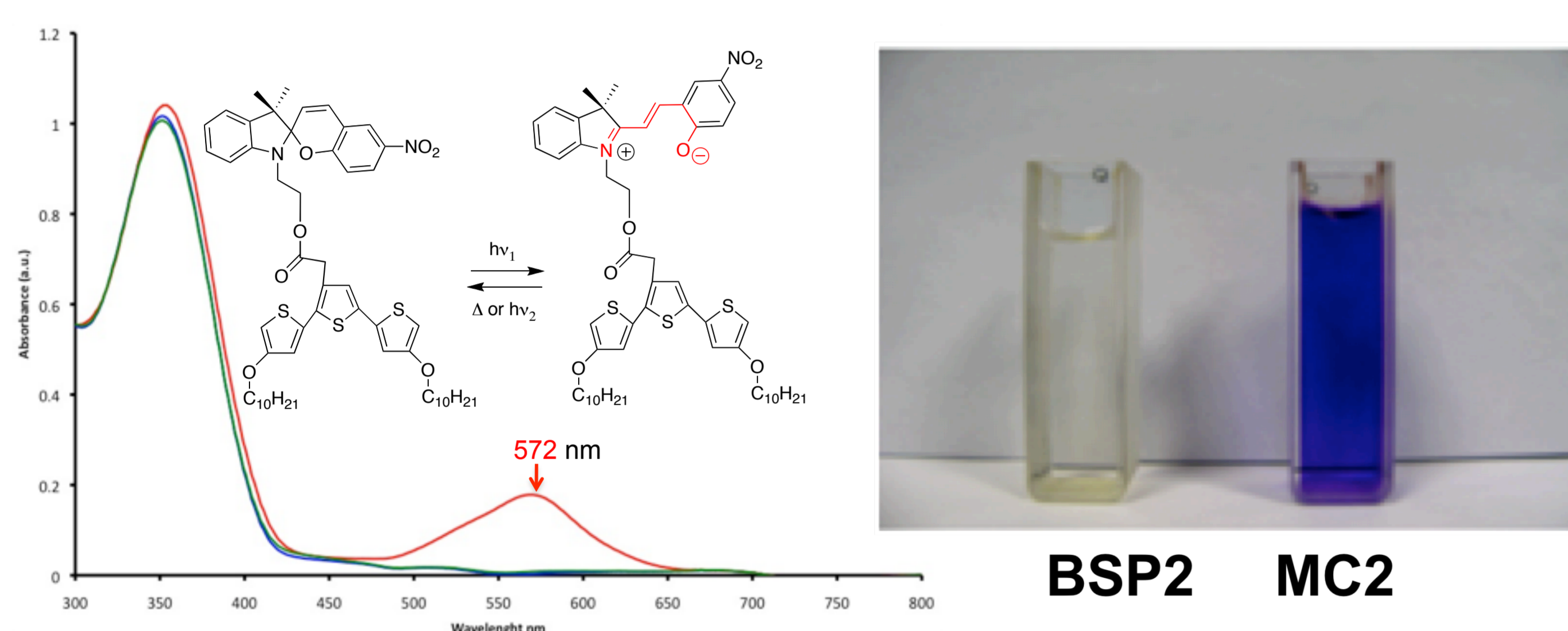
## INTRODUCTION

The study of conducting polymers leads to new fascinating applications<sup>1-4</sup>. This work explores the innovative behaviour of hybrid conducting polymer/photo responsive materials, with particular emphasis for use in biomedical applications.

## AIMS

- Study the photochemical reactivity between a spirocyan-terthiophene modified polymer and **Fibronectin, FN**
- Gain control of the surface properties to build interactions with an important biomolecule like **FN**
- Reproduce the interactions.

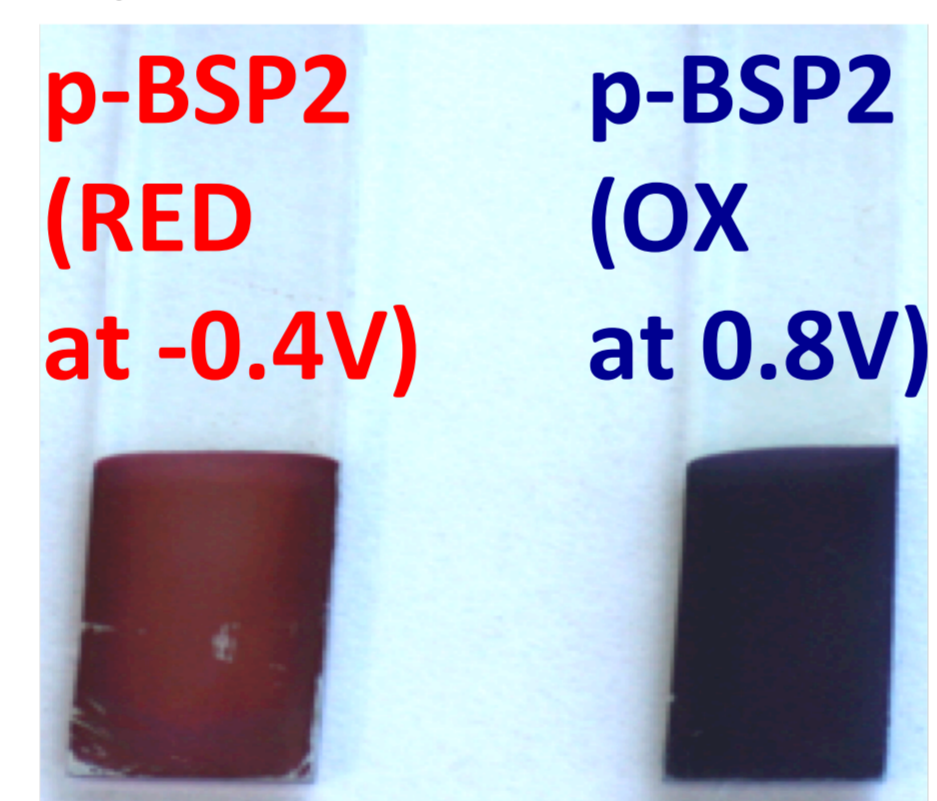
## 1- POLYMER PREPARATION



- **BSP-2** obtained through chemical condensation of spirocyan over a terthiophene unit.
- Molecule characterised with UV-vis of **BSP-2** (coloured **MC-2** at 572nm) in Acetonitrile (ACN).

### p-BSP2 electrochemical polymerization:

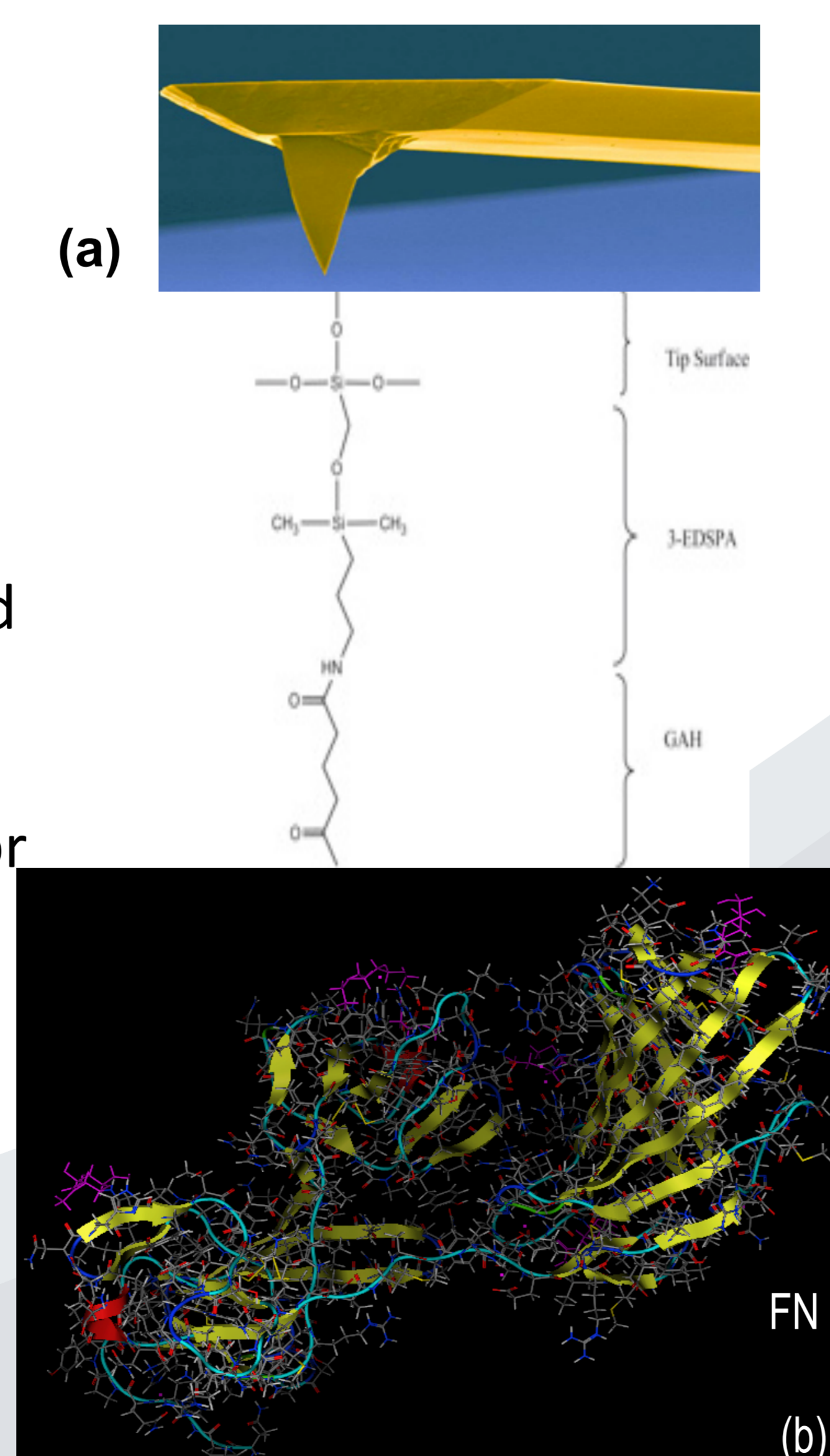
- 20 mM solution in 0.1 M TBAP electrolyte (ACN)
- ITO WE, Ag/AgCl as RE and Pt as CE.



## 2-AFM CANTILEVER PREPARATION

Nanoworld PNP-DB tips **(a)** with gold reflective coating were functionalized with **FN** **(b)**

- tips cleaned in plasma cleaner placed into a 1 % 3-EDSPA in toluene solution for 2 hours.
- Tips treated with 25 % GAH in PBS for 1 hour
- Tips were then placed into a 10 mg/mL FN in PBS solution for 1 hour, then rinsed with PBS and stored in PBS in the fridge
- Fluorescence spectroscopy proved the presence of **FN** on the tip.



## 3-PHOTO-ACTUATION

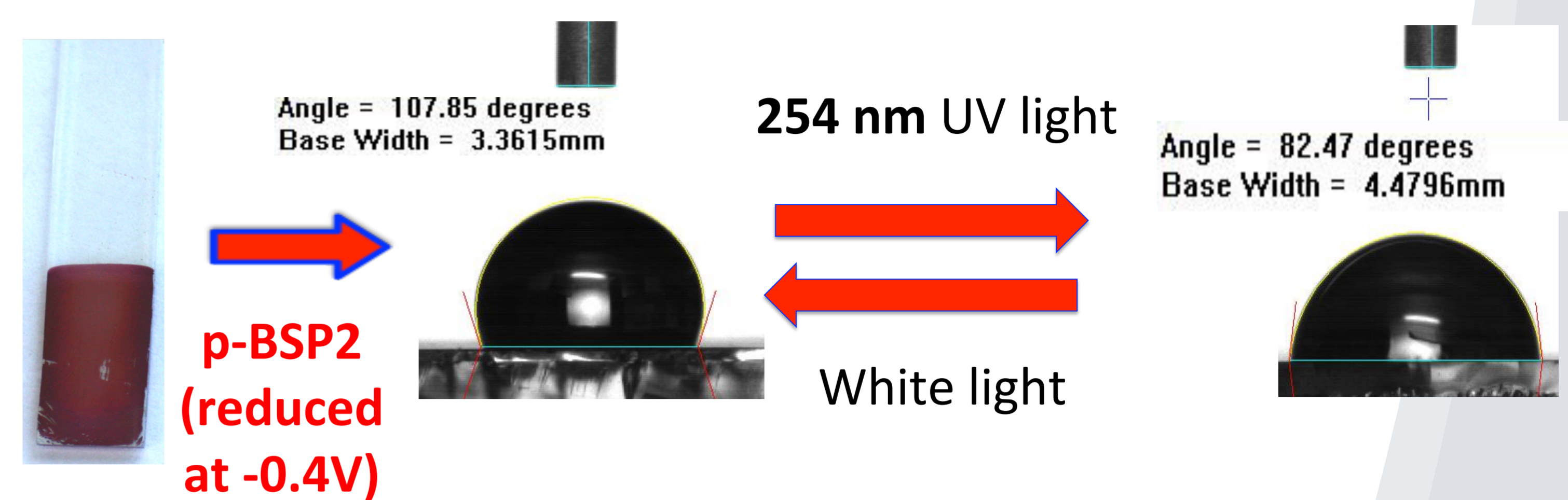
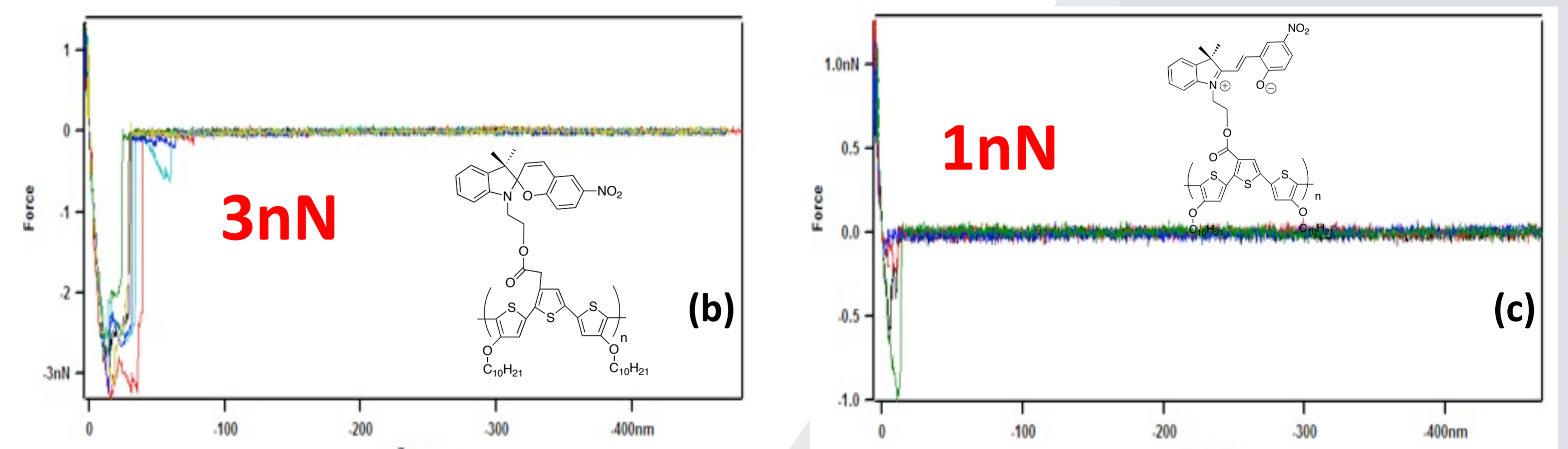
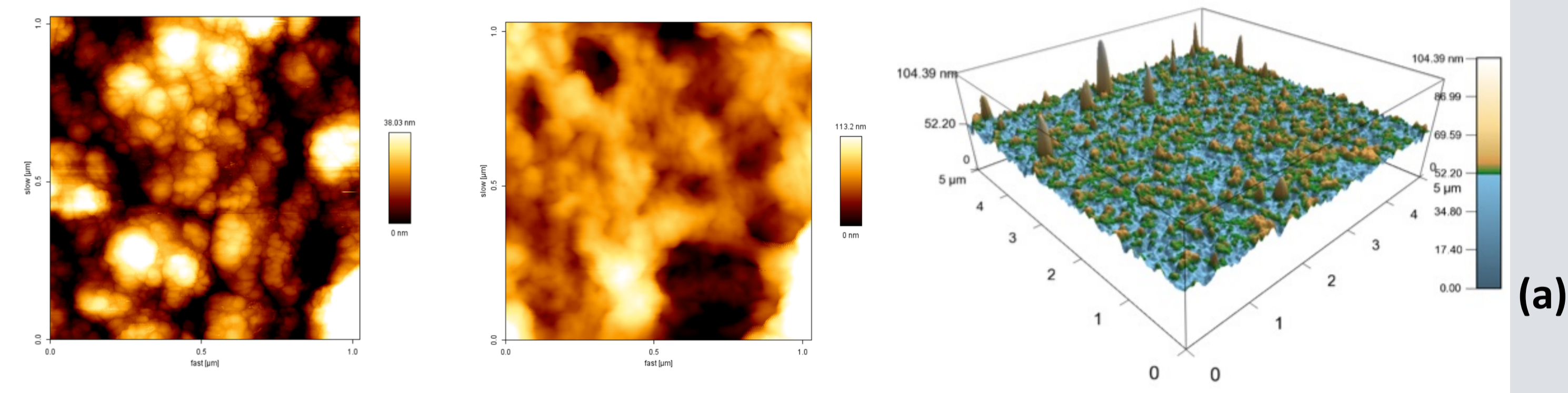


Photo-actuation was repeated over 5 freshly polymerized films. Cycles of illumination were repeated for 10 times for each film.

## 4-AFM + FN + pBSP2 INTERACTION



## DISCUSSION

- New physical interactions between **p-BSP2** and **FN** manageable **photonicly**
- Higher adhesion of the **FN** for **p-BSP2** isomer
- **p-MC2** has reduced affinity for **FN** surface-charge repulsion
- Good reproducibility pattern over the whole range of experiments.

## CONCLUSION

- Measurable interactions between the **p-BSP2** and **FN**.
- The affinity between **p-BSP2** and **FN** can be tuned **photonicly**.
- High reproducibility pattern observed during the whole broad range of repetitions.
- Applications are multiple and fascinating: bio-active platforms for tissue regeneration or multi-selective surfaces for analytical devices.

## REFERENCES

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