

# Defect-free and Biocompatible 2D Material Inks for Printed Electronics

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Solution processing of 2D materials allows simple and low-cost techniques, such as ink-jet printing, to be used for fabrication of heterostructure-based devices of arbitrary complexity. However, the success of this technology is determined by the nature and quality of the inks used.

Our group has developed highly concentrated, defect-free, printable and water-based 2D crystal formulations, designed to provide optimal film formation for multi-stack fabrication [1]. We have demonstrated printed photosensors on plastic, programmable logic memory devices, capacitors, transistors, high-gain inverters, logic gates, and current mirrors [1-4]. Our graphene ink also enables fabrication of visco-elastic electrodes for soft tissues, such as the brain [5]. Finally, cytotoxicity tests confirm biocompatibility of the 2D material inks [1]; in particular, cationic graphene dispersions produced with our approach show exceptional intracellular uptake profile as well as stability in the biological medium, making this type of graphene very attractive for use in nanomedicine [6].

## REFERENCES

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