



<b>Session 7</b>	<b>Scale-up of novel biomaterials and processes, powered by INN-PRESSME</b>
Pitch Title	BIOGUARD: Biodegradable Antennas for Counterfeit Protection
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Keywords feedstock	Graphene
Keywords technology	Printed electronics
Keywords End-Product	Antennas

**Abstract:**

Project **BIOGUARD** aimed to develop conductive inks for the production of printed near-field communication (NFC) antennas typically used in applications such as anti-counterfeit. The primary objectives sought to print these inks on paper based substrates which could be recyclable or biodegradable, providing a more sustainable option to current state of the art metallic antennas or those printed on plastic substrates such as PET. Also, avoiding organic solvents typically used in the manufacture of conductive inks was a priority objective.

Although not all objectives were fulfilled, the consortium were able to optimise the formulation of an aqueous graphene/silver/cellulose hybrid ink with significantly enhanced conductivity (< 1 ohm/sq. @ 25 micron) and minimal metal content (<7 wt.%). In terms of resistance per square, the final formulation accessed a new conductivity range that is in between metal and graphene-based existing inks.

These novel inks were printed successfully on 62 gsm Sylvicta paper (ArjoWiggins), a substrate that is fully recyclable, compostable and biodegradable that opens up a diverse array of more sustainable printed electronics applications.

