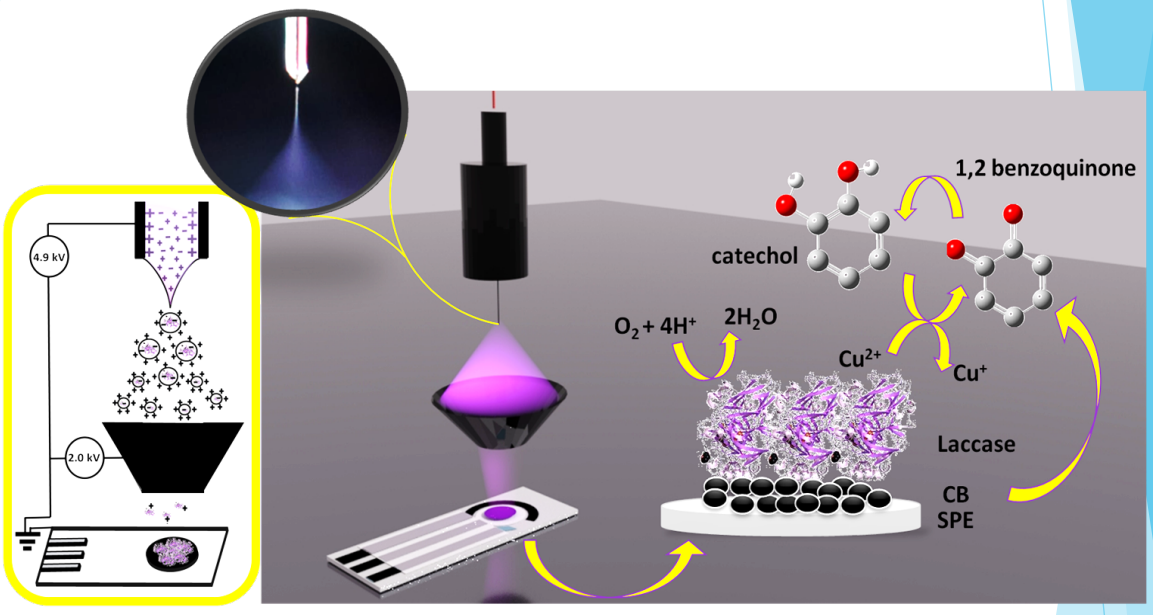
“Nuove tecnologie per sensori e biosensori @ CNR- Area della Ricerca di Roma 1”
25 Febbraio 2021- Virtual Event

Evento nell’ambito del Progetto
«Deposizioni per ElectroSpray Ionization e biosensoRi-DESIR»
Bando «progetti di Grupppi di Ricerca» 2017-Legge13/2008-art4 Lazio Innova



Credit: Biosensors and Bioelectronics 2020, 163, 112299

Partecipa all’evento da computer-tablet-smartphone:
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DESIR
DEPOSIZIONI PER ELECTROSPRAY IONIZATION E BIOSENSORI

Partner del progetto

Collaboratori del progetto

Nell'ambito del progetto DESIR (Deposizioni per ElectroSpray Ionization e biosensoRi), progetto finanziato ai sensi della L.R.13/08 BANDO "GRUPPI DI RICERCA" da Lazio Innova, è stato organizzato per il giorno 25 febbraio 2021 il workshop online "Nuove tecnologie per sensori e biosensori @ Area della Ricerca di Roma 1".

Lo scopo del progetto DESIR è quello di realizzare un prototipo per la deposizione di enzimi per biosensori per ambienti di vita, alimenti e diagnosi precoci. Il raggiungimento di questo obiettivo ha visto l'applicazione sinergica di varie competenze dalla progettazione e realizzazione di dispositivi alla preparazione e trattamento di soluzioni e di biosistemi, dalla simulazione teorica con metodi di dinamica molecolare ai software per il controllo in real-time di strumentazione e di analisi dati. Molte di queste competenze hanno visto coinvolti colleghi di Istituti dell'Area della Ricerca Roma 1 e PMI che collaborano con questi Istituti.

Da questa esperienza è nata l'idea di utilizzare l'evento per dare evidenza delle competenze multidisciplinari presenti sull'Area nel settore delle tecnologie per sensori e biosensori e delle collaborazioni con PMI del territorio che hanno trovato applicazione in tutta una serie di progetti europei o nazionali in settori quali salute, ambiente, agroalimentare e beni culturali.

L'evento fornirà anche l'occasione per confrontarsi sulle tecnologie sviluppate, e valutare le possibili applicazioni/collaborazioni e opportunità di mercato insieme a PMI innovative presenti sul territorio e dare un piccolo contributo alla costruzione di un pianeta più sostenibile.

Agenda	Speaker		Time
Welcome	L. Avaldi Project Coordinator		9:00-9:05
Opening	*On. M. Smeriglio,* Dr. G. Mancini, Prof. A. Di Carlo		9:05-9:30
DESIR Project: Principal results	Speakers L.Avaldi, P. Bolognesi, A.R. Casavola, A. Cartoni, M Castrovilli		9:30-10:30
Topic1: Diagnostica medicale	PMI Microsis	R. Antoniucci	10:30-11.15
	Progetto Sensocard	M. Parracino	
	PMI Sens4Med	F. Arduini	
Time for discussion: Meet the speakers 10:45– 11.15			
Topic2: Diagnostica ambientale	Progetto AD-SWIM	V.Scognamiglio	11:15-12:00
	PMI Biosensor	G. Varani	
	Progetto INAIL-(BRIC16ID12/BRIC19ID07)	A. Macagnano	
Time for discussion: Meet the speakers 12:00-12:15			
Topic2: Diagnostica ambientale	Progetto NMP-APACHE	D. Trucchi	12:15-13:00
	Progetto AQUALITY	C. Bombelli	
	Progetto Life-RESPIRE	G. Ciotoli	
Time for discussion: Meet the speakers 13:00-13:15			
Conclusive remarks 13:15-13:30			

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INAIL-BRIC16ID12/

BRIC19ID07

COMPOSITE POLYMER-BASED NANOFIBERS IN CONDUCTIVE CHEMICAL SENSORS FOR VOLATILE AND GASEOUS COMPOUNDS IN WORKPLACES: INAIL BRIC16-ID12

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Quantifying gas and volatile organic compounds (VOCs) to which personnel can be exposed, are becoming ever more a critical process due to rigorous environmental regulations and increasing health concerns. An inaccurate monitoring procedure introduces errors in health estimations, with consequent repercussion onto epidemiological research worldwide. Stuffy air can be responsible of tiredness and headaches, affecting people's comfort and wellbeing as well as productivity. On the other hand, more serious consequences can occur such as eye, nose, and throat irritation, nausea, dizziness and in some cases acute and chronic respiratory illnesses including asthma, pneumonia, chronic obstructive pulmonary disease (COPD), Legionnaires' disease and building- related illness (BRI). Besides these unspecific adverse health effects, some VOCs are proven to be carcinogenic (e.g., benzene, styrene) or are suspected to be carcinogenic (e.g., formaldehyde). Furthermore, the actual concentrations of gaseous pollutants can also be amplified by other external factors including poor ventilation, humidity, and temperature. Air quality monitoring should be generally performed with specialized equipment and analytical methods by regulatory agencies and researchers. However, low-cost, and easy to use sensors able to monitor the various environments in real time, alerting people if necessary, are becoming a likely strategy. A strategy carried out within BRIC16 ID12 Project, used sensors based on polymeric fibers since extremely attractive for their low cost and great versatility of the raw materials that could be easily modulated,

depending on the transducer used and the analytes. More in detail, the attention was focused on the challenging goal of developing miniaturized conductive sensors for measuring gases and VOCs by employing suitable scaffolds of eco-friendly (polyhydroxy alkanoate-PHA) and sustainable (recycled) nanomaterials (polystyrene-PS). The conductivity was achieved by introducing inside fibers mesoporous graphitized carbon (MGC, i.e. mesoporous graphene). The selectivity of fibers was modified by encapsulating macromolecules sensitive to several classes of gas and VOCs. Therefore, heterocyclic compounds of tetraphenylporphyrins (TPPs) were synthesized and solubilized within selected polymer blends solutions and subjected to electrospun deposition on interdigitated metal electrodes. More specifically, Me-TPP within PS-PHB-MGC fibers had a key role to make the sensors more conductive and sensitive to several VOCs, especially to aromatic hydrocarbons. Conversely, MGC within PS-PHB fibers increased their sensitivity to electron withdrawing gas (NO_2) and selectivity could be set by changing the sensor working temperature (30°-100°C).

References

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