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Immobilized metal-organic frameworks films for bio-sensing applications

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Metal Organic Frameworks (MOF) and their derived compounds have become an important area of research in materials chemistry. Due to enormous advantages of MOFs, researchers are exploiting them for a number of technological applications such as in sensing, gas storage, separations, catalysis, luminescence, etc. The coordination geometry of the metal and the topology of the linkers in the MOFs provide strong chemical bonds and ordered structure to these compounds, thus imparting high thermal and chemical stability. Post synthetic modification further imparts additional properties that can be exploited in applications such as bio-sensing, imaging, drug delivery etc. In the present work, Cu-MOF films have been grown on alumina substrate as a robust bio-sensing platform using solvothermal technique at room temperature. The topological studies of as-grown films were carried out using field emission scanning electron microscope (FE-SEM) and Atomic Force Microscopy (AFM). The synthesized MOF was characterized using UV-Vis spectroscopy, FTIR, XRD and FE-SEM. The conductivity to the synthesized MOF films was introduced by immersing in TCNQ/chloroform solution for 72 hours. Anti-BSA antibodies have been conjugated to the pendent groups of MOF film using EDC-NHS chemistry. The developed biosensor can be explored further for the conductometric sensing of counter antigen i.e., BSA protein by measuring change in conductivity of MOF film for development of specific and sensitive sensors for bio-sensing applications.

Biography

Atal Anudeep Singh Gill is currently a student at Amity University (Noida). He is pursuing his BTech+MTech (dual) Nanotechnology degree. His research interests are MEMs, NEMs, Bio-electronic nanosensors, solar cells and fuel cells.

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A low-cost alternative expression system for recombinant protein production in *Schizosaccharomyces pombe*

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Yeasts are amenable for the expression of heterologous proteins of therapeutic value originating from other eukaryotic organisms. Patent protection of *Pichia pastoris* based vectors entail payment of high license fees to the inventor. This triggered out effort to develop an alternative, cost effective system in *Schizosaccharomyces pombe*, which because of several molecular similarities with eukaryotes and whole genome sequenced is deemed to be potentially an ideal host for heterologous protein expression. In present work, we have developed an expression vector with strong promoter achieving higher yields of soluble protein than *P. pastoris*. Using this expression vector, we achieved consistently high level of bench scale expression of GFP, luciferase and Hepatitis B surface antigen (100-300 mg/l) which was not only 20-40 fold higher than that achieved with the known strong promoters of *Schizosaccharomyces pombe* but also over 10-fold higher than that of AOX promoter of *Pichia pastoris*. Thus our expression vector holds great potential for low cost production of therapeutic recombinant proteins.

Biography

Suchita Srivastava has completed her PhD from CSIR-CIMAP in 2014 and she is currently working as DBT-Research Associate under the mentorship of Dr. Jagmohan Singh at CSIR-IMTECH. She has published 14 research papers in reputed national and international journals and participated and presented her research work in national and international conferences. She is holding membership of 5 scientific bodies and she has also been the participant of First Science conclave and Nobel laureate Meet at IIIT, Allahabad.

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