

## تعبئة الإهتمامات البحثية (نموذج رقم 1)

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2/11/2019	تاريخ تقديم النموذج Submission date	fataya@ksu.edu.sa	البريد الإلكتروني Email
<p>Cloning, expression, purification and molecular characterization of some genes and their translation products of biological, industrial and clinical importance. Among of them GST, Urate oxidase (Uricase) and Asparaginase. Glutathione S-transferase as detoxifying enzyme, Urate oxidase and asparaginase as treatment for cancer.</p> <p>The Methods used include bioinformatics, genomics and bioinformatic tools. Bioinformatics: designing primers, making alignment for amino acids, building the phylogenetic tree, prediction of secondary, tertiary and quaternary structure, molecular modeling, etc.</p> <p>Genomics: Different molecular biology techniques including PCR, agarose gel electrophoresis, cloning in plasmid vectors (cloning and expression vectors), transformation, optimization of expression etc.</p> <p>Proteomics: including protein purification using suitable chromatographic technique, protein estimation and quantification, enzyme assay, characterization and kinetics (Km, pH optima, effect of substrate concentration, effect of inhibitors, enzyme stability, etc)</p> <p>The facility of Circular Dichroism is available as a deal with Protein Research Chair.</p>			الإهتمامات البحثية Research interests (~100 words)
<p>Project title:</p> <ol style="list-style-type: none"> <li>1- Molecular characterization of recombinant urate oxidase from <i>Penicillium digitatum</i></li> <li>2- Molecular characterization of recombinant asparaginase from <i>Aspegilus sp.</i></li> <li>3- Biochemical study on recombinant GSTM from <i>Camelus dromedarius</i></li> </ol> <p>As an example of research proposal is the Urate oxidase Abstract</p> <p>Urate oxidase enzyme or uricase (UOX) is a uric acid metabolizing enzyme that exists in most terrestrial animals except primates including human (Tsahar et al., 2006). The elevation of uric acid in blood causes many health problems. Recently, UOX has been approved from FDA to be used as a therapeutic agent for the treatment of hyperuricemia and Tumor lysis syndrome (TLS). Moreover, it is used in the manufacture of diagnostic kits for the enzymatic uric acid determination.</p> <p>Hypothesis or scientific justification of the proposal (1-2 paragraph) Urate oxidase activity has not been found in many terrestrial animals (including human). The only UOX used in the treatment of hyperuricemia and Tumor lysis syndrome (TLS) is rasburicase. To the best of our knowledge, no work has been done on UOX from <i>Penicillium digitatum</i>. The preliminary bioinformatics study indicated that <i>P. digitatum</i> could be a promising source</p>			المواضيع المقترحة للمشاريع البحثية للطلبة الدراسات العليا (الماجستير) Proposed topics for master research projects

<p>for UOX that could be used in many applications. In this work, a molecular study will be done on recombinant UOX from <i>Penicilium digitatum</i> using concurrent approaches: molecular biology and bioinformatics tool and biochemistry analysis tools.</p> <p>First, the bioinformatics approach: We will employ bioinformatics methods to identify the gene that codes for UOX in different organisms. These data will be used to compare its primary, secondary and tertiary structure besides its phylogenetic relationship with other organisms.</p> <p>Second, Molecular cloning and expression. The clone containing in pET series plasmid vector UOX will be provided by the supervisor. The optimization of gene expression will be done to produce the highest quantity of soluble active enzyme for recombinant enzyme purification and characterization. The catalytic and physicochemical properties of the recombinant enzyme will be studied.</p> <p>Third, Functional and structure characterization. The kinetics of recombinant enzyme activity will be studied and its structure will be explored by Circular Dichroism.</p> <p style="text-align: center;">Specific objectives</p> <ol style="list-style-type: none"> <li>1- Expression and purification of UOX from <i>Penicilium digitatum</i></li> <li>2-Biochemical characterization of the enzyme activity.</li> <li>3- Elucidation of the secondary and tertiary structure of the enzyme.</li> </ol>	
0	<p>الابحاث المنشورة مع طلبية الدراسات العليا Publishing with post graduate students</p>
<p>عينات samples, مواد و تجهيزات Materials and equipment, تقنيات ضمن خطة البحث, Techniques within the research plan</p>	<p>توفر مستلزمات المشروع Availability of project supplies</p>
2	<p>العدد المقترح للإشراف على طلبية الدراسات العليا وحسب اللائحة According to the regulations, proposed number of supervised postgraduate students</p>
<p>I confirm that the information given in this form is true, complete and accurate.</p>	<p>إقرار Endorsement</p>