

تعبئة الإهتمامات البحثية (نموذج رقم 1)

Associate Professor	المسمى الوظيفي Job title	Md. Ashrafuzzaman	Name / الاسم
9/13/2021	تاريخ تقديم النموذج Submission date	mashrafuzzaman@ksu.edu.sa	البريد الإلكتروني Email
نعم Yes			هل لديك الرغبة في الاشراف على الماجستير Do you wish to supervise MSc
نعم Yes			هل لديك الرغبة في الاشراف على الدكتوراه Do you wish to supervise PhD
<p>Main theme: Quantification of drug-target and drug-off-target binding and understanding the underlying mechanisms.</p> <p>Our ongoing projects are:</p> <p>Drug-Lipid binding and Drug-Protein binding energetics.</p> <p>Aptamer-based Drug Design. We have a visionary project ongoing, 'Designing aptamers for targeting biomolecules responsible for diseases'. We have got 2 US patents.</p> <p>Opportunity: We are recruiting graduate students to work in any of these projects. Students will work combining sets of biophysics and biochemistry techniques.</p>			Research interests (~200 words)
<p>Title: Nanotechnology for drug delivery</p> <p>The project proposes a novel nanotechnology based drug delivery protocol targeting cellular interior regions. Treatment of diseases like cancer, Alzheimer's, neuronal disorders, and many other challenging ones require delivery of drugs near the vicinity of cell membranes or regions beyond where the drugs act on specific proteins, microtubules, nucleic acids, etc.</p> <p>Nanoparticles are popularly used to carry the drugs with them and deliver into the cellular environment. Blood vessels play a major role. Blood fluid carries the nanoparticles with drugs. But the mismatch between required nanoparticle and blood vessel dimensions at cellular environment causes lack of successes in delivering drugs beyond cell membranes. It is reported by many investigators that nanoparticle carrying blood vessel's dimension can not approach as low as even a lipid head group cross sectional area~60 Å². Transport of nanoparticles beyond membranes therefore requires a very slow and uncontrolled diffusion of nanoparticles across a membrane which is in most cases just unimaginable considering the membrane's barrier properties. Nanoparticle delivery of drugs beyond cell membrane regions therefore requires a different kind of nanotechnology requiring the consideration of the properties of both</p>			المواضيع المقترحة للمشاريع البحثية للطلبة الدراسات العليا (الماجستير) Proposed topics for master research projects

<p>nanoparticles and membranes We are in process of developing a novel nanotechnology to solve this issue under this project.</p>	
<p>Title: Aptamers as theranostic drugs: Implication on Apoptosis in Cancer treatment (chemotherapy applications)</p> <p>The project proposes information-driven entropic fragment-based and energy-based approaches toward the development of therapeutic drugs targeting apoptosis in cancer treatment. We will target several biomarkers which are known to indicate apoptosis including phosphatidylserine (PS) externalization and we will design and test imaging probes with potential applications in the assessment of patients undergoing cancer treatment. We will also identify potential drug targets to design regulators and test their potency regarding the enhancement of apoptosis in cancer cells. We consider a set of novel aptamer based regulators as inhibitors for BCL 2 protein (anti-apoptosis) and enhancers for BAX's pro-apoptosis effect. We wish to extend our knowledge on the aptamer-protein binding assay by doing some genetic studies in the binding sites. The discovered drugs will be tested for gross cytotoxicity effects on various cancer cell lines.</p>	<p>المواضيع المقترحة للمشاريع البحثية للطلبة الدراسات العليا (الدكتوراه) Proposed topics for doctoral research projects</p>
<p>We publish with graduate students in high impact factor journals. As we discover new aptamer-based drugs using our patented technology, patenting the new compounds is also our optimal aim.</p>	<p>الابحاث المنشورة مع طلبة الدراسات العليا Publishing with post graduate students</p>
<p>تقنيات ضمن خطة البحث, مواد و تجهيزات, عينات Techniques within the research plan, New drugs have to be synthesized as we discover them</p>	<p>توفر مستلزمات المشروع Availability of project supplies</p>
<p>1</p>	<p>العدد المقترح للاشراف على طلبة الماجستير وحسب اللائحة According to the regulations, proposed number of supervised MSc students</p>
<p>1</p>	<p>العدد المقترح للاشراف على طلبة الدكتوراه وحسب اللائحة According to the regulations, proposed number of supervised PhD students</p>
<p>I confirm that the information given in this form is true, complete and accurate.</p>	<p>إقرار Endorsement</p>