

Regional Project Concept Template (Category A)

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The information contained in this template should be uploaded to the PCMF IT platform by the Chair of the relevant regional cooperative agreement or the NLO of the Member State submitting the concept by **31 May 2012** at the latest. Based on this information the IAEA will assess whether this project concept is in line with the TC quality criteria and requirements. Concepts positively appraised will be further developed into full project documents during the design phase.

Region:	RCA (Asia)		
Regional/Cooperative agreement (if applicable)		Priority no. given by regional/cooperative agreement (for concepts proposed under the auspices of regional cooperative agreements)	
Title	Molecular epidemiology and molecular clock of dengue virus genome, comparison of different methodologies including Laser technology and molecular based technology using different genome regions for detection and sero-typing		
Field of activity			
Regional project category¹	<input type="checkbox"/> <i>√ Transnational</i> <input type="checkbox"/> <i>Regional standard setting</i> <input checked="" type="checkbox"/> <i>√ Capacity building for developing countries</i> <input checked="" type="checkbox"/> <i>√ Joint TC activities with a regional or international entity</i>		
Names and contact details of project counterparts and counterpart institutions (starting with the main counterpart)	<p>Hafsa Aziz, Senior Scientist Nuclear Medicine Oncology and Radiotherapy Institute (NORI),G8/3 P.O.BOX NO.1590,Islamabad, Pakistan Tel.No.92-51-9260611, Fax No. 9260616</p> <p>Mrs Shahnaz Murtaza, Deputy Chief Scientist Nuclear Medicine Oncology and Radiotherapy Institute (NORI),G8/3 P.O.BOX NO.1590,Islamabad, Pakistan Tel..No.92-51-9260611, Fax No. 9260616</p> <p>Dr. Abida Raza, Senior Scientist Nuclear Medicine Oncology and Radiotherapy Institute (NORI),G8/3 P.O.BOX NO.1590,Islamabad, Pakistan Tel..No.92-51-9260611, Fax No. 9260616</p> <p>Dr Shazia Fatima, Principal medical officer Nuclear Medicine Oncology and Radiotherapy Institute (NORI),G8/3 P.O.BOX NO.1590,Islamabad, Pakistan Tel..No.92-51-9260611, Fax Np. 9260616</p> <p>Dr. Javaid Irfan, Director NORI Nuclear Medicine Oncology and Radiotherapy Institute (NORI),G8/3 P.O.BOX NO.1590,Islamabad, Pakistan Tel..No.92-51-9260611, Fax No. 9260616</p> <p>Dr Mushtaq, Deputy Chief Scientist Pakistan Institute of Nuclear science and technology (PINSTECH) Tel..No.92-51-2208052</p> <p>1. NORI Nuclear Medicine Oncology & Radiotherapy Institute 2. PINSTECH Pakistan Institute of Nuclear Science and Technology 3. SIH Shifa International Hospital, Islamabad 4. RGH Rawalpindi General Hospital 5. PIMS Pakistan institute of medical sciences, Islamabad 6. PINUM Punjab Institute of nuclear medicine 7. PAEC PAEC General hospital 8. NIBGE National Institute Biotechnology and Genetics engineering 9. AEMC Atomic Energy Medical Centre, Karachi</p>		

¹ See the document entitled "Policy and Procedures for TC Regional Projects" at:
http://pcmf.iaea.org/DesktopModules/PCMF/docs/2014_15_Docs/notes/Regional_TC_Project_Policy.pdf

	<p>10. C ENUM Centre for Nuclear Medicines, Lahore 11. GIN UM Gujranwala Institute of Nuclear Medicine and Radiotherapy 12. IN MOL Institute of Nuclear Medicine & Oncology, Lahore 13. KI RAN Karachi Institute of Radiotherapy & Nuclear Medicine, Karachi 14. MI NAR Multan Institute of Nuclear Medicine and Radiotherapy, Multan 15. AH F Allied Hospital, Faisalabad 16. Sheikh Zaid Hospital, Lahore 17. Civil Hospital, Faisalabad</p>
<p>Analysis of regional Gap / problems/needs</p>	<p>Dengue fever is an infectious disease caused by the dengue virus. Dengue viruses (DENV 1–4) are mosquito-borne members of the family Flaviviridae, genus <i>Flavivirus</i>. Dengue has become a worldwide problem since the Second World War and is endemic in more than 110 countries. DENV infections have been reported in over 100 countries in Africa, the Americas, the Caribbean, Eastern Mediterranean, Southeast Asia and the Western Pacific regions (CDC 24/7). The incidence of dengue fever has increased dramatically since the 1960s, approximately 100 million cases of dengue are reported annually, resulting in approximately 500 000 cases of DHF with an estimated 50 000 deaths. Moreover its incidence in Pakistan occurs more rapidly in 2011 than in previous years. The virus is transmitted to humans by the mosquitoes <i>Aedes aegypti</i> and <i>Ae. Albopictus</i>. The increasing incidence of transmission and non availability of proper treatment and vaccine of dengue virus indicate the need for rapid and reliable method for detecting and identifying the serotypes of dengue virus. Thus, a rapid and accurate dengue diagnosis has paramount importance for effective control of dengue outbreaks in this region and especially in Pakistan. In addition dengue genome sequence data generated help to develop molecularly, engineered vaccine suitable for the region. Lack of molecular laboratory facilities result in late diagnosis and hence subsequently increase the complication associated with the progressive disease in this region of the world.</p>
<p>Why should it be a regional project?</p>	<p>Dengue fever is a common problem of Asian region. According to UN report incidence of this disease in 2010 was 80,065 cases in Indonesia, followed by 57,948 cases in Thailand and 27,142 cases in Sri Lanka. Its incidence in Pakistan is rapidly increasing in 2011 than in previous years. One of the reasons of rising of this infection is poor diagnosis. Therefore cooperation for detection and generation of molecular genome data help in prevention and management of disease.</p>
<p>Stakeholder analysis and partnerships</p>	<p>Major stakeholder would be PAEC and IAEA. Diagnosis and treatment are the priority areas of PAEC medical centres. IAEA through its various programmes is providing help to its member states in developing validate and utilizing different early and rapid diagnostic techniques that are simple to use, inexpensive and can be applied in a 'laboratory limited' environment for betterment of human health. The technical cooperation departments of IAEA are providing technical help in the area of Human Health in terms of technical expertise, infrastructure and financial assistance through different avenues. PAEC and IAEA have long history of cooperation and commitment towards each other's goals which is quite apparent from their cooperation and commitment in different projects in establishing new practices; transferring updated technology in clinically relevant and updated diagnostic and therapeutic applications</p>

Overall objective (or developmental objective)	<p>To develop quick and reliable diagnostic methodology for Dengue detection and generating of genome sequence data of the virus prevalent in this region of the world. That will enable us for the determination of impact of introduced strains versus indigenous evolution on disease outcome. In addition we also find stability of polymorphism across the entire genome. Further, these data will provide the information necessary to develop cost-effective strain diagnostics for disease tracking and outbreak response</p>
Analysis of objectives	<pre> graph TD A[Dengue infected blood samples] --> B[Development of rapid diagnostic test for dengue virus using molecular based technology (PCR)] A --> C[Analyse by transmission laser technology] B --> D[Detection correlation between molecular technology and transmission Laser technology] C --> D D --> E[Develop and compare sero-typing methodologies based on different genome region by using specific primers] E --> F[Verified by using radioactive labelled probes.] E --> G[Verified by sequencing] F --> H[Describe epidemiological trend of dengue type's infection in Pakistan] G --> H H --> I[Report phylogeny, genotypes and molecular clock analysis of dengue virus genome] I --> J[Generated data help in the management of dengue virus in this region of the world and give future guideline for vaccine production] </pre>
Role of nuclear technology and the IAEA	<p><i>Technique used in the project involve radioactive labelled probes and Laser technology Training and financial support</i></p>
Project duration	<p><i>Four years</i></p>
Requirements for participation	<p><i>Institutes dealing with Dengue fever positive patients</i></p>

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Participating Member States	Country: <i>Pakistan (PAEC)</i> Role: <ul style="list-style-type: none"> <input type="checkbox"/> Resource (providing expertise) <input checked="" type="checkbox"/> Target (receiving expertise) Country: <i>IAEA</i> Role: <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Resource (providing expertise) <input type="checkbox"/> Target (receiving expertise) 			
Funding and project budget	Provide an estimate of the total project costs and the funding expected from each stakeholder:			
Government cost-sharing	Euro 50,000 USD	Comment Fully equipped molecular diagnostic lab of NORI		
Counterpart institution(s)	NIL			
Other partners				
IAEA Technical Cooperation Fund (TCF):	Fellowships / Scientific visits / Training courses/ Workshops	20,000 USD		
	5000 USD			
	Experts	15,000 USD		
	Equipment and chemicals	20,000 USD		
TOTAL	110,000 USD			