



FORM 101 Application for a Grant PART I			
Institutional Identifier		Date Nov, 21, 2019	
System-ID (for NSERC use only)			
Family name of applicant <b>Al Hadeethi</b>	Given name <b>Mariam</b>	Initial(s) of all given names <b>M.A</b>	Personal identification no. (PIN) 20010869
		Institution that will administer the grant Queen's	
Language of application <input checked="" type="checkbox"/> English <input type="checkbox"/> French		Time (in hours per month) to be devoted to the proposed research / activity	
Type of grant applied for NSERC Engage Grant		For Strategic Projects, indicate the Target Area and the Research Topic; for Strategic Networks indicate the Target Area. Transposable Elements and Disease Resistance	
Title of proposal Department Incorporation of transposable elements involved in Xa 2 1 R gene in non-resistant mutants of <i>indica</i> rice cultivar LT 2			
Provide a maximum of 10 key words that describe this proposal. Use commas to separate them. Transposable elements, plant, disease, resistance, Xa21, CRISPR, specificity, rice, agriculture			
Research subject code(s) Primary		Area of application code(s) Primary	
Secondary		Secondary	
<b>CERTIFICATION/REQUIREMENTS</b>			
If this proposal involves any of the following, check the box(es) and submit the protocol to the university or college's certification committee. Research involving : Humans <input type="checkbox"/> Human pluripotent stem cells <input type="checkbox"/> Animals <input type="checkbox"/> Biohazards <input type="checkbox"/>			
Indicate if the proposed research takes place outdoors and if you answered YES to a), b) or c) – Appendix A (Form 101) must be completed. <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES			
<b>TOTAL AMOUNT REQUESTED FROM NSERC</b>			
Year 1 128,000	Year 2 129,000	Year 3 130,000	Year 4 0
		Year 5 0	
<b>SIGNATURES (Refer to instructions "What do signatures mean?")</b>			
It is agreed that the general conditions governing grants as outlined in the NSERC Program Guide for Professors apply to any grant made pursuant to this application and are hereby accepted by the applicant and the applicant's employing institution.			
Applicant Applicant's department, institution, tel. and fax nos., and e-mail Department of Biology, Queen's University 8namp@queensu.ca		Head of department Dean of faculty President of institution (or representative)	

Personal identification no. (PIN)

20010869

Family name of applicant

Al Hadeethi

**SUMMARY OF PROPOSAL FOR PUBLIC RELEASE (Use plain language.)**

This plain language summary will be available to the public if your proposal is funded. Although it is not mandatory, you may choose to include your business telephone number and/or your e-mail address to facilitate contact with the public and the media about your research.

Business telephone no. (optional):

E-mail address (optional):

Jumping genes, other known as transposable elements (TEs), are components found within the genome of many species. Originating as selfish elements, these TEs have evolved alongside host genomes to confer a variety of functions, including regulation and genetic diversification. In plants, this diversification is especially relevant as they tend to be more susceptible to damage due to environmental changes (relative to mobile species). A subset of transposable elements that contribute to gene resistance within the plant genome have been found to allow plants a more plastic response to pathogen infection. This study looks at resistance of rice plants to bacterial blight in the context of transposable elements. A rice gene referred to as *Xa21* is known to confer resistance to this destructive disease and at least some of its function can likely be attributed to transposable elements. To gain further insight, this study aims to generate experimental evidence of a specific subset of these elements conferring resistance in the Rice Cultivar LT2. We also test for the extent of this possible resistance based on different combinations of the TEs. In doing so, we hope to inform discussions regarding transposable elements as well as agricultural practices in a productive manner.

**Other Language Version of Summary (optional).**

Personal identification no. (PIN)

Family name of applicant

Before completing this section, read the instructions and consult the *Use of Grant Funds* section in the NSERC Program Guide for Professors for information about the eligibility of expenditures for the direct costs of research and the regulations governing the use of grant funds. On separate page(s), supply a detailed explanation, and justification, for your proposed expenditures. Also explain the relationship or difference between this application and all other research support (held or applied for), and describe any contributions from other sources (if applicable).

**PROPOSED EXPENDITURES FOR DIRECT COSTS OF RESEARCH (include cash expenditures only)**

	Year 1	Year 2	Year 3	Year 4	Year 5
<b>1) Salaries and benefits</b>					
a) Students	16,000	16,000	16,000		
b) Postdoctoral fellows	22,000	22,000	22,000		
c) Technical/professional assistants	22,000	22,000	22,000		
d)					
<b>2) Equipment or facility</b>					
a) Purchase or rental					
b) Operation and maintenance costs					
c) User fees					
<b>3) Materials and supplies</b>	68,000	68,000	68,000		
<b>4) Travel</b>					
a) Conferences		1,000			
b) Field work					
c) Collaboration/ consultation					
<b>5) Dissemination costs</b>					
a) Publication costs			2,000		
b) Other activities					
<b>6) Other (specify)</b>					
a)					
b)					
<b>TOTAL PROPOSED EXPENDITURES</b>	128,000	129,000	130,000		
<b>Total cash contribution from industry (if applicable)</b>					
<b>Total cash contribution from university (if applicable)</b>					
<b>Total cash contribution from other sources (if applicable)</b>					
<b>TOTAL AMOUNT REQUESTED FROM NSERC (transfer to page 1)</b>	128,000	129,000	130,000		