1. INTRODUCTION

The Core Curriculum for the Kidney Research Scientist Core Education and National Training Program (The KRESCENT program) promotes the development of excellent kidney researchers in Canada, capable of transdisciplinary research activities that will foster knowledge translation. The curriculum is delivered across the country, irrespective of trainee location.

A major goal of the Core Curriculum is to offer unique learning opportunities for those enrolled in the KRESCENT program, which are not accessed in any other forum or location. The Core Curriculum is designed to be complimentary to any core course work / degree programs in research design, methodology, and other core content areas, which the participants are engaged in. It is also complimentary to the trainee-specific research project(s), which will continue to be developed locally, either independently (in the case of New Investigator Awardees), or in conjunction with the local research supervisor (in the case of Fellowship or Doctoral trainees).

The Core Curriculum of the KRESCENT program consists of several educational activities, exercises, and processes designed specifically to foster development of skills important to successful academic careers for kidney research scientists:

1) Formal Core Lecture Series, held at workshops, twice yearly (Knowledge Acquisition Modules [KACM])

2) Knowledge Application and Integration Exercises:
   2.1 Critical appraisal of journal articles (basic and clinical/translational science):
       a) as part of workshop exercises and
       b) as formal members of the CJKHD (Canadian Journal of Kidney Health and Disease) editorial board.
   2.2 Journal article writing on a review topic describing translational research in a prescribed area (replaces previous TransDisciplinary Research Challenge (TDR); aimed at first year KRESCENT participants, and develops manuscript writing skills on translational themes amongst a group of trainees with varied backgrounds).

3) Grant-writing and peer review exercises, directed at trainees beyond year one.
   3.1 Participation in mock grant peer review panels, which use the same peer review processes as KFOC or CIHR;
   3.2 Roles as either first or second reviewers; or Chair/Scientific Officer for the Grant review committee.

4) Presentation skills:
   4.1 Slide presentations
   4.2 Speaking skills
   4.3 Presentation of data for oral vs. written venues

5) Chairing of components of workshop (ensuring time constraints upheld; introductory comments, fielding questions)

6) Career Development Sessions: These sessions typically occur at the start of every workshop, and a variety of topics is covered during the 3 year cycle of training (e.g. time management, gender issues in research, career promotion, how to secure an academic position). Content experts from the Canadian Nephrology community are typically invited to chair these sessions, and trainees are active participants in discussion/questions.

7) Mentorship: Program mentors are assigned to all New Investigators in KRESCENT (see description below).
Participation in the Core Curriculum:

The Core Curriculum is tailored to the special talents and needs of those outstanding candidates accepted into the KRESCENT program. KRESCENT program awardees must participate and successfully complete the Core Curriculum as a requirement for their continued KRESCENT program support. In this regard, attendance at all workshops (twice yearly) is mandatory.

For the KRESCENT program awardees, expenses related to the Core Curriculum will be covered (e.g. flights, accommodation, according to The Kidney Foundation of Canada reimbursement guidelines).

KRESCENT Program Workshop Agenda

The dates for the workshops and other assigned activities will be set at least one year in advance of the meeting.

The tentative 2016-2017 schedule for trainees beginning in July 2016 is:

<table>
<thead>
<tr>
<th>Place</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>KRESCENT Workshop – Fall</td>
<td>Montreal, Quebec</td>
</tr>
<tr>
<td></td>
<td>October, 28 &amp; 29, 2016</td>
</tr>
<tr>
<td>KRESCENT Workshop – Spring</td>
<td>Montreal, Quebec</td>
</tr>
<tr>
<td></td>
<td>May 3 &amp; 4, 2017</td>
</tr>
</tbody>
</table>

2. Overview of the KRESCENT Core Curriculum

A) Workshop Key Content: Core Lectures (Knowledge Acquisition Modules), Knowledge Application and Integration Exercises

- Workshops:
  1. Initial workshops will be held in the fall of each year and will serve as an intensive introduction to the objectives and mission of the KRESCENT program, as well as offering the first series of Core Lectures (Knowledge Acquisition Modules) (trainees technically begin the program on July 1 of each year, when funding starts).
  2. A second face-to-face workshop will be held at the Canadian Society of Nephrology (CSN) Annual Meeting, held in April or May of each year. This will serve as a venue for a second set of Core Lectures. The Core Lecture Series will encompass a three-year cycle. Two core topics will generally be reviewed via lectures at each workshop.

- After the first year, the annual fall meeting will also serve as an evaluative session.
- At the workshops, in addition to Core Lectures, trainees will receive orientation to the program (structure, governance, expectations, evaluation), and meet the mentors and other trainees.
Irrespective of research theme (i.e. clinical, basic, or other research theme), these Core Lectures will be relevant to all disciplines in kidney research, and will be delivered by content experts.

At each workshop, the Core Lectures will be accompanied by introduction to the relevant assignments:

1. First Year participants: Collaborate on a research problem / review area relevant to the lecture / theme material. This will result in a publication worthy manuscript which will be submitted to the CJKHD.

2. Other participants: Critical review of journal articles submitted by presenters, and lead or engage in critical appraisal discussion; preparation of presentation for the group to synthesize the discussion / key points.

Workshops will generally feature Career Development Sessions, focusing on selected topics such as Grant-Writing Skills, Time Management, Career Planning, and others.

Selected workshops will feature sessions on Research Methods (biomedical, clinical, health services or qualitative research), and presentations by industry sponsors that will focus on topics meant to support collaborative and/or translational research.

Workshops will also feature selected research-in-progress presentations from the trainees, as well as presentations on overall research directions and strategies (from senior trainees).

The fall workshop will incorporate an introduction to the first collaborative integrating exercise (previously called the Transdisciplinary Research Challenge (TDR), but now organized as a collaborative review paper focused on the area of interest.

General Objectives of Core Lecture Series (Knowledge Acquisition Modules):

To ensure that all participants acquire a core set of knowledge specific to kidney research, encompassing the four research themes of the CIHR.

To compliment existing lecture series that may be available at each institution.

On an annual basis, to introduce a specific kidney research theme (e.g. “Acute Kidney Injury”) and to cover its spectrum from bench to bedside research, to population health implications and health policy.

B) Knowledge integration and Application: Journal article reviews (New Feature of the Core Curriculum in 2013).

1) Critical appraisal of journal articles in workshops
2) Review of journal articles in timely manner for CJKHD (requires written feedback to authors and integration of # of different skills, including critical appraisal)

The purpose of these complimentary exercises regarding journal articles (those already in print and those submitted), is to permit integration of scientific knowledge, methodology knowledge, and critical appraisal skills. Within the workshop venue, discussions will occur amongst trainees from different research backgrounds, and issues will be identified / clarified for educational purposes. Examples would be: quality of figures or tables in conveying knowledge, clarity of writing, key messages, methodologic approaches, etc. The presentation of these attributes or
insights during the workshop will permit synthesis and practice expressing constructive criticism or insights to other members.

The formal review of journal articles for the CJKHD will serve a number of purposes: exposure to scientific articles in trainees’ field of interest or related field of interest; practice in reviewing articles and giving constructive criticism to peers. These required activities will be tabulated and ideally be acknowledged in CV of attendees (Editorial Board member of CJKHD) so that the ‘exercise’ will foster the trainee’s academic development. The ability to see other reviewers’ comments will add to the educational value of the ‘exercise’.

**General Objectives: Exercises:**

1) Knowledge Application and Integration (theme-specific):
   - To promote independent learning within identified areas relevant to kidney disease research.
   - To address acquisition of core skills related to the conduct of research, irrespective of content area or perspective (MD, allied health, basic or clinical researcher).
   - To ensure a core knowledge addressing the four research themes of the CIHR.

   **To promote transdisciplinary exchanges within a structured framework.**
   - To permit focus on specific areas of kidney-related research and to facilitate communication across themes.

C) **Review Article demonstrating synthesis of current state of nephrology research within specific theme (New addition to Core Curriculum in 2013):**

This unique aspect of the Core Curriculum offers an opportunity for first-year trainees to address a broad-based issue in kidney research, which encompasses at least three CIHR themes (biomedical, clinical sciences, health systems, and population health).

The goal of this exercise is to develop not only content knowledge, but also experience developing a multi-author paper, addressing the issue of authorship contributions, and demonstrating an understanding of the topic area. The work will be submitted to CJKHD (or another journal of the authors’ determination as appropriate) and thus should be of high quality. The exercise will be mentored by KRESCENT faculty and possibly other participants, but will culminate in a publication. The manuscript will be reviewed by other KRESCENT members for feedback at the April/May Workshop.

Working in teams, author trainees will collectively develop a research proposal that addresses the salient issues of the theme area; acknowledging ‘state of current knowledge’, what is not known and how best to address knowledge gaps. It is possible that more than one paper would be generated by the group, but each must demonstrate some trans-disciplinary / integration aspect.

One of the desired outputs from these papers would or could be a roadmap of a proposed research agenda in that area, or ultimately a grant proposal for review at subsequent meetings. It is believed that these publications may provide good ‘groundwork’ for KRESCENT participant grant proposals, or others. Output from the exercise will also include a 15-minute presentation to the KRESCENT participants at the Spring workshop, and formulation of an abbreviated mock grant proposal.
General Objectives of Transdisciplinary Review Manuscript Exercise:

- To develop skills in communication between disciplines involved in kidney-related research.
- To foster an appreciation of the importance of transdisciplinary input when addressing either biomedical, clinical, health services, or population health kidney research problems.
- To understand and share methodologies which traditionally have been ‘theme-specific’.
- To enhance skills that will facilitate the development of transdisciplinary grant initiatives in the future.
- To improve manuscript and potentially grant writing skills.
- To gain an understanding of complexity of multi-author publication logistics.

D) Grant-writing and Peer Review Exercises

Trainees beyond their first year in the KRESCENT Program will submit Research Grant applications or Manuscripts for review, and/or participate in peer review of draft grant applications, via written critical assessments. KRESCENT trainees will also be involved in peer review of the Transdisciplinary Review Manuscript exercise.

E) Mentoring Program

A novel and important aspect of the KRESCENT program is a built-in mentoring system that will facilitate career development. Trainees at the Fellowship level will meet with the Program Mentors at the twice-yearly workshops, and interact in a Career Development Workshop setting. New Investigator Awardee, on the other hand, will be paired with a specific Program Mentor, expert in his/her field of research (i.e. biomedical, clinical, health services, population health). Accordingly, the KRESCENT program provides level-specific mentorship, which does not conflict with the important mentorship role of the research supervisor during the Fellowship period. Program Mentors will receive progress reports on individual trainees, from their supervisors and the Program Steering Committee. Thus, for Fellowship-level trainees, the roles of the mentor and supervisor are distinct and complimentary:

The Research Supervisor directs all of the research work relevant to the trainee’s research program, and is considered the lead mentor.

- The Program Mentor evaluates progress with respect to the KRESCENT program,
  - ensures that the goals of the KRESCENT program are met,
  - facilitates changes, if needed, to optimize training,
  - facilitates career transition counselling, negotiation of academic appointment, consideration of options for Faculty positions, etc.

During the first three years of a faculty position (New Investigator Awardees), it is expected that the candidate and designated Program Mentor will interact at least two times a year. The mentor will advise the candidate with regards to the provision of conditions/resources required to sustain an independent career in research. If required, the mentor will suggest changes to
the candidate or will help the candidate interact with his institution in order to secure, on a long-term basis, the optimal research conditions. More specifically, the mentor will assist in:

1. Reviewing the percentage of protected time for research required and provided.
2. Reviewing the resources available to the candidate to assist in development of the research program.
3. Helping the candidate to evaluate the quality of the research environment, and suggesting changes that might be required, including development of collaborative relationships, which might foster knowledge translation.
4. Providing assistance and guidance with regards to grant writing, manuscript preparation, and research directions.
Appendix A

TABLE 1: Six-Year Core Curriculum Template, and Level-Specific Requirements

<table>
<thead>
<tr>
<th>TIME OF ENTRY TO PROGRAM</th>
<th>Program Component</th>
<th>Yr 1</th>
<th>Yr 2</th>
<th>Yr 3</th>
<th>Yr 4</th>
<th>Yr 5</th>
<th>Yr 6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fellowship or Doctoral Scholar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>New Investigator</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Core Lectures</td>
<td>M x 2</td>
<td>M x 2</td>
<td>M x 2</td>
<td>M x 2</td>
<td>M x 2</td>
<td>M x 2</td>
<td>M x 2</td>
</tr>
<tr>
<td>Critical Appraisal</td>
<td>M x 2</td>
<td>M x 2</td>
<td>M x 2</td>
<td>M x 2</td>
<td>M x 2</td>
<td>M x 2</td>
<td>M x 2</td>
</tr>
<tr>
<td>Journal articles in</td>
<td>M x 2</td>
<td>M x 2</td>
<td>M x 2</td>
<td>M x 2</td>
<td>M x 2</td>
<td>M x 2</td>
<td>M x 2</td>
</tr>
<tr>
<td>workshops</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Review of Journal</td>
<td>M x 1</td>
<td>M x 1</td>
<td>M x 1</td>
<td>M x 1</td>
<td>M x 1</td>
<td>M x 1</td>
<td>M x 1</td>
</tr>
<tr>
<td>articles for CJKHD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trans-disciplinary</td>
<td>M x 1</td>
<td>O</td>
<td>O</td>
<td>M x 1</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Review Exercise</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>and manuscript</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grant writing and/or</td>
<td>-</td>
<td>M x 1</td>
<td>M x 1</td>
<td>M x 1</td>
<td>M x 1</td>
<td>M x 1</td>
<td>M x 1</td>
</tr>
<tr>
<td>peer review</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

M = mandatory (for Core Lectures, M x 2 indicates requirement for attendance at 2 workshops per year)

O = optional (discretion of trainee)

* trainee must deliver core lecture, focused on overview of his/her research program and potential for knowledge translation.