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How CIHR is Addressing Antimicrobial Resistance, Nationally and Internationally?

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June 19, 2014

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Disclosure

- I, Serge Desnoyers, PhD, in my capacity of Adjunct Professor at Laval University, receive royalties from the company Millipore Corporation on sales of a monoclonal antibody that I have produced in my laboratory.

- This fact is not related in any way to the content of the following presentation.

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Why AMR is important for Canada?

- Recognized , internationally, as an emerging health crisis;
- Threatens to undermine our ability to control bacterial infections;
- Complacency generated by the success of antibiotics has lead to widespread overuse and misuse, accelerating the generation of multi-drug resistance;
- Increasingly impacting every aspect of health care, including neonatal care, transplantation and cancer care.
- Major concern for all federal, provincial and territorial governments in terms of financial implications and its impact on the sustainability of Canada's healthcare system.

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Importance shared by G8 countries

- Science Ministers of the G8 countries met in London in June 2013.

- At the top of the agenda was dealing with global challenges, namely antibiotic resistance in medicine, and how governments can work together to develop new antibiotics and employ them more wisely;

- Specifically, in their statement, Ministers committed to:

  - preserve the efficacy of existing antimicrobial agents, in part by avoiding misuse and optimizing prescribing practices in their respective countries;
  - prevent the emergence of antimicrobial/drug resistance, in part through developing rapid diagnostics to inform antimicrobial drugs use;
  - support the development of new diagnostics to improve early diagnosis of antimicrobial resistant infections and improve treatment efficacy;
  - support theoretical and applied research to better understand the origin, spread, evolution and development of resistance in microorganisms

Canada's integrated approach

- Maintains 2 national surveillance systems: (1) the Canadian Integrated Program for Antimicrobial Resistance Surveillance monitors & analyzes antimicrobial use in humans in community settings, as well as AMR in selected bacteria throughout the food chain; and (2) the Canadian Nosocomial Infection Surveillance Program (CNISP) conducts surveillance of AMR organisms in human health care facilities across Canada:

- Regulates the sale of antimicrobial drugs for use in humans and establishes policies and standards related to the safety and nutritional quality of the food supply;

- An Institute priority for CIHR's Institute of Infection and Immunity (III) which has supported numerous research initiatives that seek to better understand the origin, spread, evolution and development of resistance in microorganisms;

- Responsible for patient treatment with supporting roles for both surveillance and research activities through its various health authorities and research councils.

Provincial and Territorial Governments

What and where is CIHR currently investing

- Under the leadership of CIHR's Institute of Infection and Immunity (III) Scientific Director, Dr. Marc Ouellette, research on antibiotic resistance has been a research priority for CIHR since its inception in 2000.

- In 2012-2013 alone, CIHR invested approximately **$15.3 million** in the area of antimicrobial resistance.

- Strategic investments include **Novel Alternatives to Antibiotics (NAA)** initiative, which includes focus on areas such as phage therapy and probiotics in which Canada had little or no research capacity.

- CIHR-III has developed several other important innovative programs such as the **Safe Food and Water initiative** and programs addressing the **health system implications of antibiotic resistance**.

CIHR is also leading internationally

Canada UK Joint Health Research Program on Antibiotic Resistance

- Partnership between MRC UK & CIHR to develop joint research strategies;
- UK MRC & CIHR launched 2nd funding opportunity in 2010;
- Partnership has already disbursed the first half of the funding of two teams/consortia on "Novel Antibiotic Targets in Cell Wall Biogenesis" & "Bacterial Resistance to Beta-Lactam Antibiotics" for a combined investment of $4 million & £2 million, respectively.

Antimicrobial Resistance (JPIAMR)

- Coordinates research that will lead to sustainable use of antibiotics to treat infections diseases & to a decrease in the number of patients with resistant infections in Europe.
- 19 Member states have joined forces in the JPIAMR with first Joint Call "*InnovaResistance: Innovative Approaches to address antibacterial resistance*" launched on January 27, 2014
- The total sum available is €14,11 million (with CIHR providing € 4.1 million)

Why we are investing with Europe through Joint Programming?

- Innovative, collaborative research approach to tackle highly critical health challenges;
- Enhances the impact of research by aligning and building upon existing national programs and identifying common goals that would benefit from joint action; and,
- provides a framework for future investment to be more effectively harnessed to improve prevention, diagnosis, treatment and patient care.

... and how does this fit with our broader organizational strategy?

CIHR Research Priorities

- *Enhance Patient-Oriented Care and Improve Clinical Results through Scientific and Technological Innovations*
- *Support a High-Quality, Accessible and Sustainable Health-Care System*
- *Reduce Health Inequities of Aboriginal Peoples and other Vulnerable Populations*
- *Prepare For and Respond To Existing and Emerging Threats to Health*
- *Promote Health and Reduce the Burden of Chronic Disease and Mental Illness*

CIHR III Strategic Priority 1: *Preparing for and responding to existing and emerging threats. The sub-topics of interest are:*

- Antimicrobial resistance;
- Existing and emerging microbial threats;
- Environment and health;
- Vaccines development;
- Improved diagnostics.

Moving forward, what are the gaps that need to be addressed?

Lack of awareness

- Under-reported and consequently the seriousness of the problem is under estimated
- Need to better educate the media, public and governments

Need to better utilize public and private sector partnerships

- Need to better exploit successful PPPs
- Need to intensify collaboration with industry to better understand their interests and challenges

Need to increase financial investment

- Need to conduct new research into the fundamental mechanisms of AMR with clinical studies;
- Need to monitor the impact of AMR at various levels of our health care system;
- Need to assess health services readiness to respond; and,
- Need to accelerate through research the development of new drugs, new vaccines and new technologies in collaboration with industry partners.

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… and more research is still needed

- While recent progress has been significant through international efforts, there are a number of challenges that need to be addressed.

- Efforts need to be made for creating more opportunities for sharing lessons learned and sharing of activities across the full spectrum of research in specific areas/themes that include :

  - biomedical/genomics/proteomics;
  - pharmacological/development of new antibiotics;
  - health services and policy research (hospital practices & surveillance)
  - diagnostics;
  - links to agriculture;
  - antibiotic stewardship; and
  - alternative approaches .

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