Join us for the 2022 NephroCAGE Symposium

Aug 16, 2022 @ 6.15 am PDT / 9.15 am EDT / 3.15pm CEST

Héloise Cardinal, MD, PhD

Local site PI, CHUM

NEPHROCAGE

German-Canadian consortium on AI for improved kidney transplantation outcome

2nd International NephroCAGE Symposium, Aug 16, 2022

Hasso Plattner Institut

Karlsruher Institut für Technologie

The University of British Columbia

Université de Montréal

Polytechnique Montréal

GenomeQuébec

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PIRCHE

Charité

Centre universitaire de santé McGill

McGill University Health Centre

CHUM

GenomeCanada

Genome British Columbia

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NephroCAGE
What is in a name?

2nd Int'l NephroCAGE Symposium, Aug 16, 2022

- NephroCAGE is a German and Canadian research consortium that brings together experts in clinical transplantation, machine learning, data/ computer science, industry, to build clinical prediction models that will help transplant teams care for kidney transplant recipients

- Unique aspects of NephroCAGE
  - Use of state of the art assessment of immunological risk with epitope matching assessment (PIRCHE partner) to tailor immunosuppression
  - Use a federated learning infrastructure to build the clinical prediction models while ensuring data confidentiality

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NephroCAGE
The people, the centers

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- Clinicians
  - Klemens Budde, Marcel Naik (Charité, Berlin)
  - Ruth Sapir-Pichhadze (McGill University Health Center, Montreal)
  - Paul Keown (St-Paul Hospital, University British Columbia, Vancouver)
  - Héloise Cardinal (Centre Hospitalier de l'Université de Montréal (CHUM), Montreal)

- Machine learning experts
  - Matthieu-P. Schapranow, Aadil Rasheed, Mozhgan Bayat (Hasso Plattner Institute, Potsdam)

NephroCAGE
The people, the centers

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- Federated learning infrastructure experts
  - Konstantin Pandl, Florian Leiser (Karlsruhe Institute of Technology)
  - Michael Chassé, Pascal St-Onge (CHUM)
  - David Buckeridge, David Bujold, Guillaume Bourque (McGill)
  - Oliver Gunther (UBC)

- Industrial partner
  - Matthias Niemann, Andreas Schimanski (Pirche)




NephroCAGE
Activities in the past 2 years and ongoing

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- Activities divided in 'Work packages', shared webworkspace 'Confluence'
- WP 1: Federated learning infrastructure
  - Definition, implementation, and evaluation of the FLI for the NephroCAGE project.
  - Requirements analysis at each institution
  - Identification of DLT designs and framework for selection of a DLT-based FLI
  - Ongoing: design and development of DLT-based FLI architecture
- WP 2:Local data extraction
  - Extraction of relevant project data from local hospital information systems including use and access.
  - Protocol drafting and ethics approval at various centers
  - Data harmonization
    - -Definition of minimal and extended datasets
    - -Difference in units of measurements
    - -Feature definition (proteinuria, cause of chronic kidney disease)

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NephroCAGE
Activities in the past 2 years and ongoing

- WP 3: Matching algorithm
  - Design and implementation of a pilot epitope matching algorithm (B cell and T cell)
- WP 4: Matching benchmark
  - Establishing, applying and evaluating a benchmark for HLA epitope matching algorithms based on retrospective cohort data
  - Anonymized access epitope match for clients
- WP 5: Local training of clinical prediction model
  - Choice of CPM (5-year graft survival with up to 1 year clinical data)
  - Initial training on Charité data

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NephroCAGE
Activities in the past 2 years, ongoing and future

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- WP 6:CPM deployment
- WP 7: CPM demonstrator
- WP 8: Project management and dissemination
  - Overall coordination of projects-WP
  - Knowledge translation initiatives (consortium, web-based publications)
  - Legal contracts between institutions
  - Funding opportunities in Canada and Germany

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