

Metabolomics Innovation Resource

Rosalind & Morris Cancer Institute, McGill University
401A Cancer Pavilion: 1160 Pine Avenue West,
Montréal

Mission

Act as an extension of McGill researchers' laboratories by providing analytical expertise, high quality and reproducible metabolic phenotyping.

Services

LC/MS, GC/MS and NMR based targeted & untargeted services
-- In-vivo respiration analysis

Custom Services

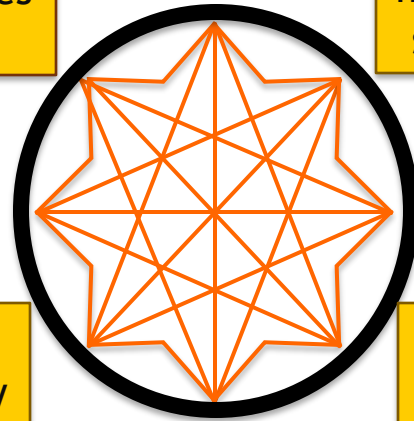
Developing custom MS and NMR methodologies for validation or specific metabolite targeting.

Applied Innovation

Collaborating to create new technologies & methodologies with OMG team members

Training

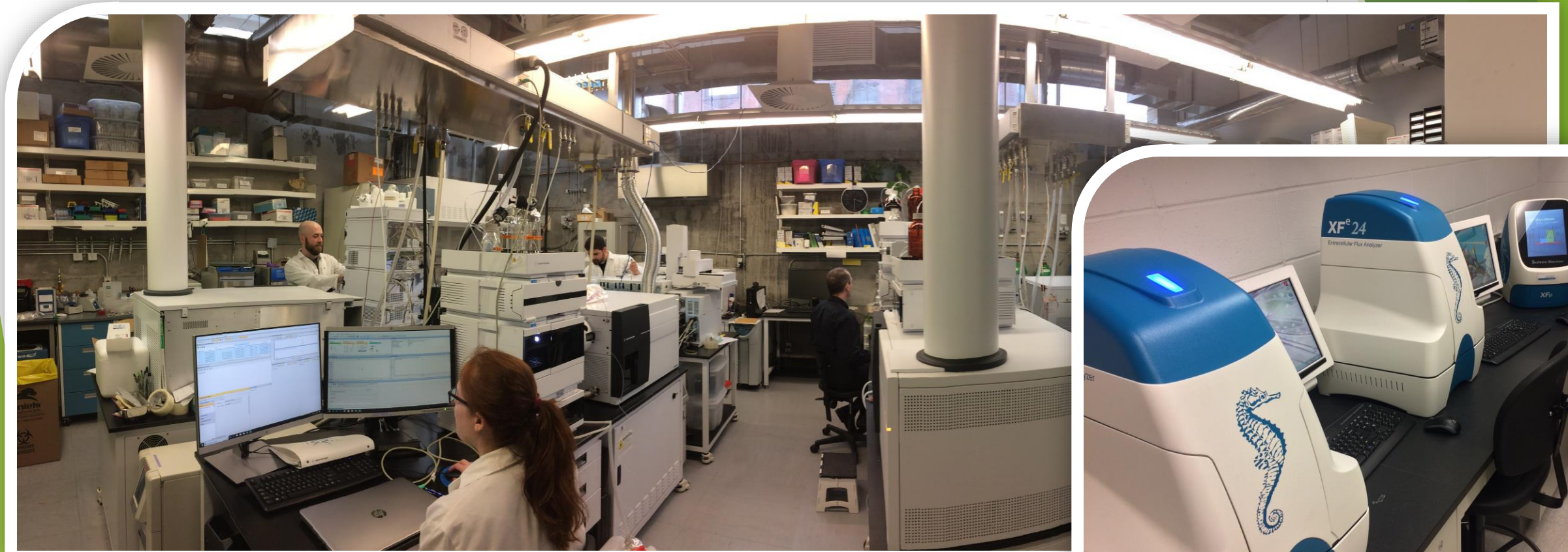
Teaching investigators how to collect and analyze their own metabolic data



I HAVE ONE OF THOSE METABOLISMS WHERE I CAN EAT WHATEVER I WANT AND MY BODY CONVERTS IT TO ENERGY AND STORES THE EXCESS AS FAT.



MIR - Metabolomics Innovation Resource at the Rosalind & Morris Goodman Cancer Institute



2x LC-QQQ, 2x LC-QTOF, 2x GC-MS, SFC



XFe96, XFe24, Xfp

Who are we?



Dr. Daina Avizonis (Facility manager – NMR, LC/MS, GC/MS)
Ph.D. in Physical Chemistry from the University of California (San Diego). She brings expertise in NMR, LC-NMR/MS, LC-MS, GC-MS and Stable Isotope tracer analysis.



Luc Choinière (GC/MS & BioNova)
B.Sc. in Biology from McGill University. He brings over 30 years expertise in GC-MS.



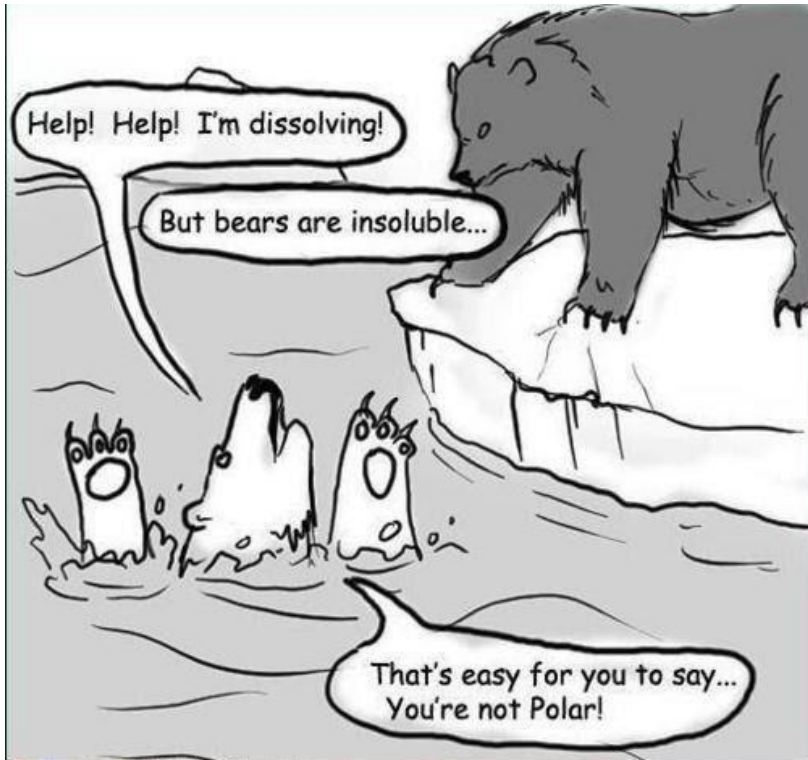
Mariana Russo (LC/MS)
M.Sc. in Analytical Chemistry from Concordia University. She brings expertise in LC-MS, GC-MS and Stable Isotope Tracer Analysis.



Cian Monnin (LC/MS)
M.Sc. in Biochemistry from Concordia University. He brings expertise in LC-MS, LC-MS based lipidomics, and Stable Isotope Tracer Analysis

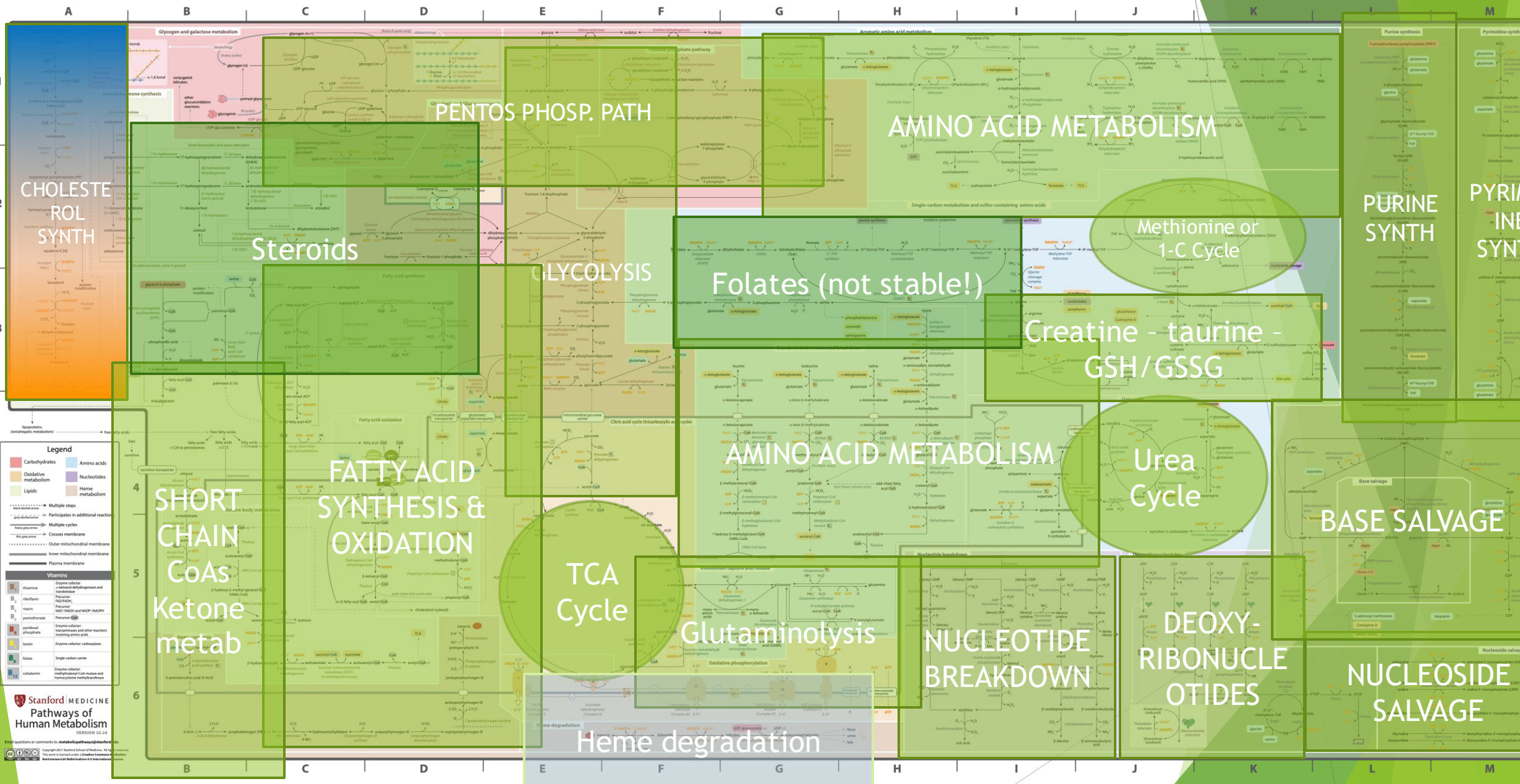


Bozena Samborska (seahorse)
M.Sc. in Molecular Cellular biology from Guelph University. She brings expertise in metabolism and helps support the Seahorse platform. She is a research assistant in L. Kazak laboratory.



The Challenge: Metabolite chemistry

- Volatility
- Wide dynamic range
Millimolar → Femtomolar
- Hydrophobicity / polarity
- Mass range
Gasses → Lipids
- Chemical (in)stability
- Isomers



1
2
3

CHOLESTEROL SYNTH

Glycogen and galactose metabolism

PENTOS PHOSP. PATH

Steroids

GLYCOLYSIS

FATTY ACID SYNTHESIS & OXIDATION

SHORT CHAIN CoAs Ketone metab

TCA Cycle

Heme degradation

AMINO ACID METABOLISM

Folates (not stable!)

AMINO ACID METABOLISM

Glutaminolysis

NUCLEOTIDE BREAKDOWN

AMINO ACID METABOLISM

NUCLEOTIDE BREAKDOWN

NUCLEOTIDE BREAKDOWN

NUCLEOTIDE BREAKDOWN

AMINO ACID METABOLISM

Methionine or 1-C Cycle

CREATINE - TAURINE - GSH/GSSG

Urea Cycle

AMINO ACID METABOLISM

AMINO ACID METABOLISM

AMINO ACID METABOLISM

AMINO ACID METABOLISM

AMINO ACID METABOLISM

PURINE SYNTH

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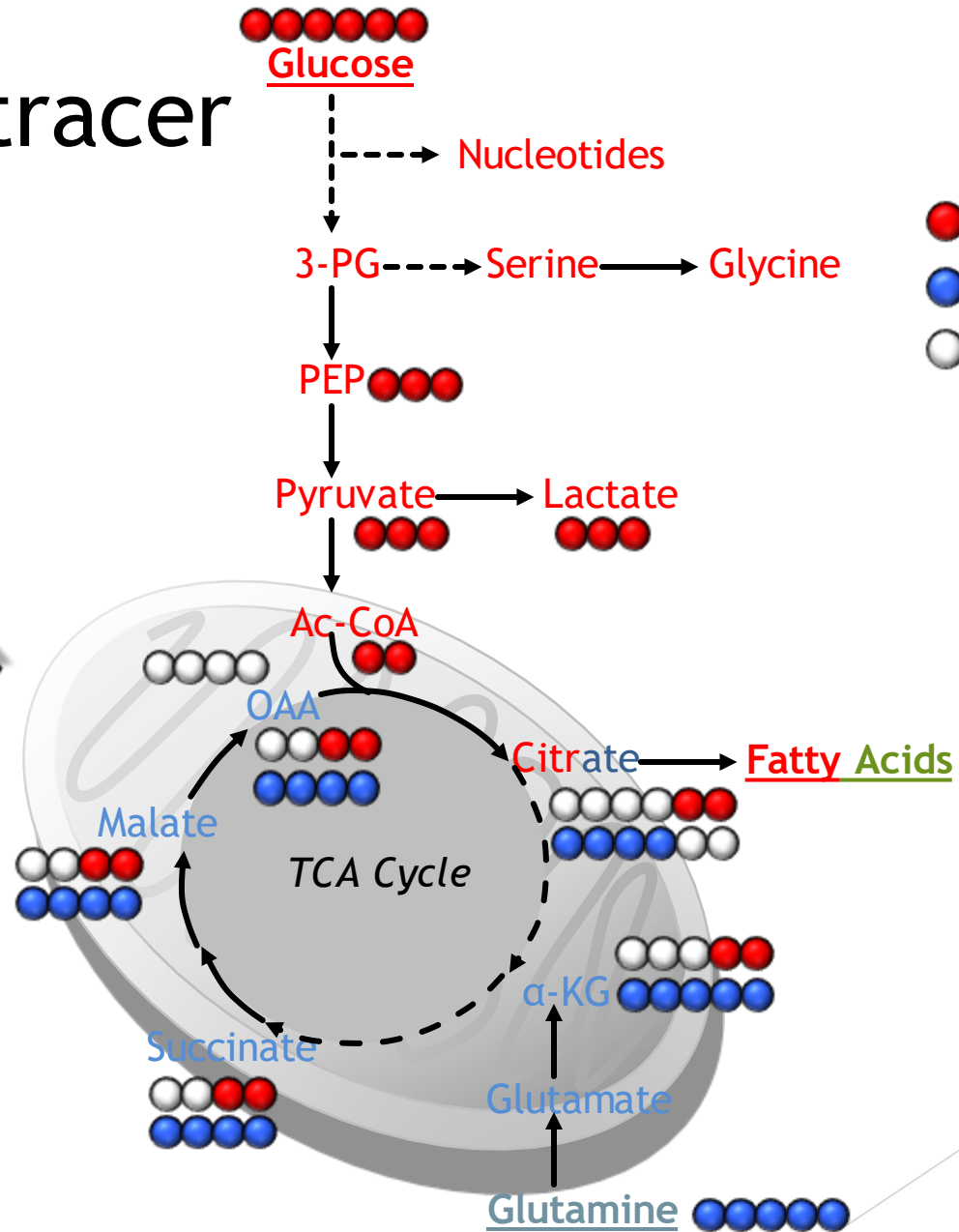
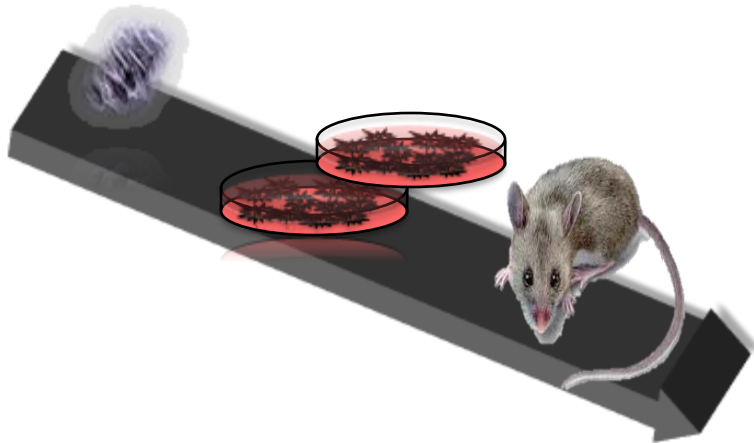
PYRIMIDINE SYNTH

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Stable isotope tracer analysis



- U-¹³C Glucose
- U-¹³C Glutamine
- Unlabeled Carbon

An aerial photograph of a city, likely Montreal, showing a dense urban landscape with numerous skyscrapers and a prominent circular building in the foreground. A large green arrow points from the text 'We are here!!' towards a QR code in the bottom left corner. The QR code contains a small image of a bar chart and a diagram.

We are here!!

MIR

*Luc Choiniere
Mariana Russo
Cian Monnin
Bozena Samborska*

Funding

Breast Cancer Quebec
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GCI
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(CORRSF)