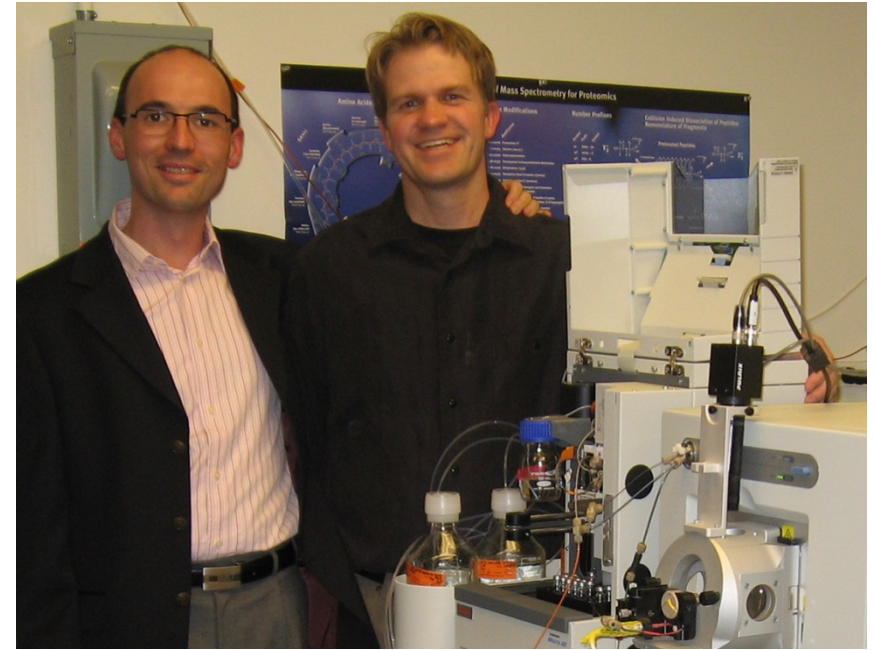


# Third Blood Type Mystery Solved using a UVM Mass Spectrometer

- In the 1950's, "Patient Vel", a 66 yo woman with colon cancer suffered a severe rejection of transfused blood
- She is missing a protein on the surface of RBCs common to the general population.
- Her blood type (Vel-negative) is found in 200,000 people in Europe and same number in North America; statistics of Vel negative phenotype is 1:2500.
- Successive transfusions are fatal due to the development of antibodies against the newly discovered protein molecule, Small Integral Membrane Protein (SMIM1)
- The protein was identified biochemically using Vel-negative antibody as bait on the surface of RBCs and analyzed by high resolution mass spectrometry.
- The phenotype is caused by a deletion mutation resulting in the non expression of SMIM1 on the surface of RBCs of Vel-negative patients.



Dr. Lionel Arnaud of the French National Institute of Blood Transfusion (left) and UVM Associate Professor of Biology, Dr. Bryan Ballif (right), stand behind the mass spectrometer used in the identification of the molecular basis of the rare Vel-negative blood type.

Research Article  
Molecular basis of the Vel- blood group

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Molecular Medicine

## Disruption of *SMIM1* causes the Vel- blood type

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