



Interview with Prof. Martin L. Olsson—meeting the challenge of blood group genotyping to provide safe blood for transfusion

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Expert's introduction

Martin L. Olsson received his M.D. [1991] and Ph.D. [1997] from Lund University in Sweden where he is a Professor and Senior Consultant in Transfusion Medicine and also the Vice Dean of the Faculty of Medicine. He is the Medical Director of the Nordic Reference Laboratory in Lund. His main clinical and research interest is the molecular genetics of blood groups with an emphasis on carbohydrates and host-pathogen interactions. Prof. Olsson has published more than 130 peer-reviewed articles and is co-author of the popular *Blood Group Antigen FactsBook* [2012]. He was Associate Editor of *Transfusion Medicine* [2006–2014] and served as Scientific Secretary of the International Society of Blood Transfusion (ISBT) [2011–2015]. Now he is the President-elect of ISBT [2016–2018].

His awards include the Jean Julliard Prize from ISBT [2000], Race & Sanger Award from BBTS [2004], Hain Foundation Prize [2005], Claes F. Högman Honorary Lectureship from the Swedish Society of Transfusion Medicine [2010], James Blundell Award from BBTS [2013], the ISBT Award [2015], Wallenberg Clinical Scholar appointment [2016–2020] and the Tibor Greenwalt Memorial Award from the aaBB [2017].

Editor's note

The 28th Regional Congress of the ISBT was successfully held in Guangzhou from 25 to 28 November 2017.

Jointly organised by ISBT, the Chinese Society of Blood Transfusion and Guangzhou Blood Center, the 4-day meeting brought together eminent regional and international speakers and experts in transfusion medicine or relevant fields to discuss up-to-date topics.

During the meeting, we were honoured to conduct a brief interview with Prof. Martin L. Olsson from Lund University in Sweden, who is also the Present-elect for ISBT [2016–2018], to share his views on blood group discovery, blood transfusion as well as current challenges (*Figures 1,2*).

Interview questions and responses

AME: *As we know, your team has a strong track record of discovery and characterization of blood groups during the past 20 years, which has resulted in DNA-based blood group typing tests. How has it been applied to clinical practice so far? Any progress to share?*

Prof. Olsson: I started developing genetic blood group tests in the early 1990s and we applied it to the first clinical samples in the 1995. At that time, everyone thought this was interesting from an academic point of view, but serology is so easy so there would be no need for these developments in the clinic, and of course in Lund we have a great tradition of blood group research starting the use of papain to test for Rh antibodies that was published from Lund a long time ago by one of the previous directors. Furthermore, the low-ionic strength solution (LISS) that we use for phenotyping and antibody testing all over the world was also originally published in *Vox Sanguinis* by one of the former directors, they were really interested in ABO. Lund was also involved in the first monoclonal ABO reagents used. I started ABO genotyping mainly because in 1990 that was one of the earliest gene characterizations, we have then implemented one gene after the other as they became available when they were cloned, we made a test for it and implemented. In 2001, the Nordic countries acknowledged our centre as the Nordic reference laboratory. We exchange samples nowadays so that some of the problems, for instance, Bristol encounters, when it comes to carbohydrate blood groups we can look at it and we send some others to them. The latest discoveries on Vel blood group in 2013, we implemented right away to the clinic a couple of years ago. In this way, we could find those donors. We call it a rare blood group, one in a thousand lack this blood group in our population. Previously we only knew of one donor in Southern Sweden, and then we screened many donors and found several more, because there should be quite a lot of donors around, we just couldn't find them before because of lack of serological



Figure 1 Prof. Olsson was chairing the session “Immunohematology—Novel Technology”.



Figure 2 Interview with Prof. Olsson (left) was performed by Jessie Zhong (right).

reagents but now we can.

AME: *In Sweden, what kind of applications and platforms are available for molecular blood grouping of donors and patient populations?*

Prof. Olsson: Since we started so early, much of what we did was not the commercially available ones, but we got involved quite early in developing commercial tests of these microarray-based platforms in the early 2000s. Nowadays, there are tests from that project on the European market also in Sweden and many other competitors. I guess there are too many to mention, but for us to use one of them, basically we need a CE labelled product. Then, we are allowed to use them also for clinical purposes. There are many that still are research only. We use different

combinations. Right now we use ID CORE XT, which we were involved in developing an earlier version of as part of an EU project.

AME: *It is important to improve the compatibility of blood donors and transfusion recipients. How is the compatibility status in Sweden? What are the main challenges and progress in improving the compatibility?*

Prof. Olsson: We switched from cross-matching to electronic crossmatch, which is type and screen, a long time ago. Now, most compatibility tests are performed as type-and-screen which is very practical and is good for the blood inventory, and also good to detect low-level antibodies against some significant blood groups like Duffy (FY) or Kidd (JK). Otherwise compatibility depends on the population and category of patients you need to test really. There has been a lot of migration in Europe lately. For instance, many immigrants have fled from the Eastern Mediterranean region, the Middle East and Northern Africa, especially from Syria and other war areas. Since thalassemia is very common in these regions and also other hemoglobinopathies and blood group variants this makes compatibility issues more complicated and therefore affects blood banks as well. We now have quite a lot of young people, children and adolescents who need regular transfusions, and since they were not typed originally when they were young as we would do in Sweden, we just received these patients for the first time maybe when they are 18 years old or so, and their blood is a mix of many different blood donors. We have had quite sharp increase in the number of genotyping requests that we do to resolve this issue, so that has been the main challenge lately. We do have the tools to solve it but we also need to educate the clinicians that this is the way we need to do it, to increase the safety and cost-efficiency of blood given to these patients.

AME: *Can you say something about your own research profile?*

Prof. Olsson: My research group right now is about 15 people, and we are working on different problems. I have 7 PhD students and a number of Postdocs in my group. We’re having a lot of fun and there are still lots of challenges out there, and of course we are looking at some of the orphan blood groups that we need to find a genetic home and a molecular basis for and you will probably

see some of those results already during next year. If you went to the previous ISBT Congress earlier this year in Copenhagen we were involved in ten or so abstracts, presenting my group's work. Many groups including ours are interested to analyse next-generation sequencing data and how to resolve various blood group variants like that to make sure that we interpret NGS data the right way. You may have seen our new blood group allele database connecting variants to the correct ISBT allele terminology which we published in the *Blood Advances Journal* last year (see www.erythrogene.com).

AME: *The congress has ended successfully this year. Which parts impressed you the most? As the ISBT Present-elected of 2016–2018, what's your expectation for the next year's congress?*

Prof. Olsson: I had not been in Guangzhou before but I really like the city, it's very green and inviting. It has being a pleasure being here. I've been to China several times before but Guangzhou is a new experience for me so I was impressed by that to start with. The whole conference center was very organised, the logistics seemed to work very well and I am always impressed with the fast development in China and Asia, not least when it comes to the scientific quality. There were lots of presentations and interesting data coming out here at this meeting.

In 2017, we had two regional conferences, but next year there will be one international congress in Toronto, in June 2018. I expect and hope to meet lots of people in Toronto, which is a vibrant international city. It is quite easy to access from many directions and hopefully should also be easy to get to from the formal point of view when it comes to visa and all of that for those who need those. I really look forward to another meeting where lots of new exciting things will be presented. I certainly know that many groups are aiming for that.

AME: *Thank you very much for your time!*

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