

The ESCHM “1st Hemorheology Days”, 19 - 21 July 2017 in Puchberg/Schneeberg, Austria

Jean-Frédéric Brun^a and Ursula Windberger^b

^a*U1046 INSERM, UMR 9214 CNRS «Physiopathologie and Médecine Expérimentale du Cœur et des Muscles - PHYMEDEXP», Unité d’Explorations Métaboliques (CERAMM), Université de Montpellier, Département de Physiologie Clinique, Hôpital Lapeyronie CHRU Montpellier, France*

^b*«Rheology research group», Decentralized Biomedical Facilities, Center for Biomedical Research, Medical University Vienna, Austria*

The European Society of Clinical Hemorheology and Microcirculation was founded by a group of hemorheologists from Europe, most of them being former coworkers of the pioneer of hemorheology Robin Fåhræus (1888–1968)¹.

In the middle of the XXth century the inner circle of hemorheologists was actually a very little group, although very active. They first joined in the International Society of Biorheology founded in Heidelberg in 1969. Actually, Alfred L. Copley and Helmut Hartert had created the first form of this society six years ago in 1963 during the 4th International Congress on Rheology in Providence, Rhode Island.

In 1979 the 1st European Conference on Clinical Hemorheology was held in Nancy, France, under the chairmanship of professor JF Stoltz. During this congress was established a European Coordinating Committee for Clinical Haemorheology (ECCCH), with the aim to organize further meetings. The 2nd European Conference on Clinical Hemorheology was held in 1981 in London, UK, under the chairmanship of professor J. Dormandy. This was the beginning of a series of wonderful and fascinating congresses with sometimes more than one thousand attendants, in Baden-Baden (1983), Siena (1985), Bordeaux (1987), Frankfurt (1989), Southampton (1991). In the Southampton conference chaired by S. Roath, professor John Stuart urged for the creation of an International Society for Clinical Hemorheology² that was actually founded two years later during the 8th European Conference on Clinical Hemorheology held in Vienna in 1993 under the chairmanship of E. Ernst.

At this time, some of the historical founders of the European Coordinating Committee for Clinical Haemorheology (ECCCH) decided to transform the committee into a European Society of Clinical Hemorheology (ESCH), in order to maintain this European tradition of hemorheological congresses. This was done in Frankfurt in 1993. Since that time clinical hemorheology had two great international events: the International and the European conference.

¹ Goldsmith HL, Cokelet GR, Gaetgens P. Robin Fåhræus: Evolution of his concepts in cardiovascular physiology. *Am J Physiol.* 1989;257(3 Pt 2):H1005-15.

² Stuart J. Fåhræus lecture: Blood rheology: 1991-2001. *Clin Hemorheol Microcirc.* 1992; 12, no. 1 : 29-42.

Therefore, Europe continued to host these interesting conferences every 2 years. The 9th was organized in 1995 in Siena, the 10th in 1997 in Lisbon, the 11th in 2000 in Rouen (France), the 12th in 2003 in Sofia, the 13th in Siena in 2005, the 14th in 2007 in Dresden, the 15th in 2009 in Pontresina (Switzerland), the 16th in 2011 in Munich, the 17th in 2013 in Pécs (Hungary), and the 18th in Lisbon in 2016.

Actually, after 1995, there was a dramatic decrease in financial support for such congresses and the number of attendants at the same time markedly decreased. Since more than 15 years interesting conferences with an exciting content have thus been organized with very interesting scientific content but with less than 100 attendants. The same is true with the last international joint congresses of hemorheology and biorheology organized over this period by ISB and ISCH, and in which, most of the time, we could find the same people. Undoubtedly, however, hemorheology remains well alive and several new and very active researchers have joined the circle. There is obviously a need and a will to continue this series of meetings.

The European Society of Clinical Hemorheology and Microcirculation proposed to organize thematic workshops in those years when no international congress is held. Our friend, professor Ursula Windberger immediately proposed to host the first of them in Austria, with special emphasis, of course, on hemorheology during exercise in animals and humans.

Colleagues from Austria, France, Germany, Hungary, Russia, South Africa, and Switzerland gathered in the alpine resort in Puchberg am Schneeberg and presented their studies. The focus of the meeting was on the exercise-related flow behavior of blood. Studies on human sportsmen, racing horses, and camels were presented. A further session was dedicated to the general applications of hemorheological data. For example, the forensic discipline of bloodstain pattern analysis and endovascular device developers need to understand the behavior of blood during flow. Heterogeneous systems like blood generate non-linear fluid behavior in blood vessels. These complex behaviors result from RBC properties, that lead to several RBC motions. There is still a huge amount of work left to model the blood behavior at each circumstance, either inside, or outside the human body. The use of rheometry to investigate clot formation and mechanical clot “stiffness” was elucidated in the afternoon, and professor Peter Fischer, the president of the European Society of Rheology, discussed technical difficulties during the measurement of complex suspensions and how to mitigate those difficulties. Reviews of the use of scanning SAXS on suspensions flowing through microfluidic devices, and the various shapes a RBC can undergo during disease were presented. In a practical course, the Anton Paar GmbH demonstrated the rheo-optical measurement on human blood (many thanks again to the blood donor). New international collaborations have been started during these days, all of which are very much appreciated by the conference organizers, since these outcomes belong to the best results of any meeting. We congratulate both asphalt-curling teams on their hard-earned scores, and we are happy that we could enjoy a clear view of the surrounding mountains and even to the Hungarian lowlands during the walk to the Waxriegel (1880 m). Our friend and president of the European Society for Clinical Hemorheology, Jean-Frederic Brun, closed the meeting and then there was nothing left to do, except enjoying the homemade “Apfelstrudel” and Viennese coffee on the sunny side of the plateau on top of the most eastern alpine summit.

This Puchberg « Hemorheology Days » was the first of a series of events that we want to offer in the period between the international congresses and we look forward to the next one in June 2019.

As non-linear fluid regimes undergo intensive debates we are fortunate to participating in this exciting field of research. The following pages showcase a selection of the communications presented during this meeting.