Björn Ekwall, MD, Ph.D., died on the 19th of August 2000 after a long illness. He was born in Uppsala in 1940. In 1960 he attended the Uppsala University Medical School and in 1969 he obtained his MD. After a short time as a G.P., he became lecturer at the Department of Anatomy at Uppsala University. Between 1970 and 1980 he worked for his Ph.D. in toxicology. His research consisted of large scale testing, or rather screening, of chemical toxicity for cultured cells in simple test systems. He made a first effort to evaluate the relevance of the cytotoxicity for human systemic toxicity. In 1980, he defended his doctoral thesis "Combined drug toxicity to HeLa cells in the MIT-24 test system and its relevance to human drug toxicity" at the department of Anatomy, Uppsala University.

Since the early results, as presented in his thesis, suggested an amazing relevance of the cell culture tests, he continued to work in this field. He was a postdoc for 6 month at Materials Science Toxicology Laboratories, Memphis, TN, USA (1981-1982) and, thereafter, a Consultant at the Toxicology Laboratory of the Swedish Food Administration (1982-1983). In 1983 Björn founded CTLU (Cytotoxicology Laboratory, Uppsala). The data obtained from testing hundreds of chemicals in cell cultures and comparing these with toxicity data obtained from humans and animals made him believe that most chemicals are toxic to man by interference with cell functions common to all human specialised cells. This hypothesis is the first of the basal cytotoxicity concept that was formulated by Björn Ekwall, already in 1983. From this concept a new classification of chemical toxicity into three categories was developed; extracellular toxicity, organ-specific toxicity and basal cytotoxicity. The second hypothesis of this concept is that basal cytotoxicity can be tested by using non-differentiated cell lines. In the final evaluation of the MEIC-programme, the cytotoxicity results were compared with average lethal blood concentrations (LCs) from acute human poisoning. Bjorn Ekwall soon real ised that these LCs were suboptimal for the purpose, since they were
average of data with a wide variation due to different time between exposure and sampling or death. Therefore, he spent much time in 1995-97 on a sub-project to MEIC, collecting case reports from human poisonings of the 50 MEIC reference chemicals in which lethal blood concentrations with known duration between ingestion and sampling/death was reported. The aim was to compile enough case reports to be able to construct time-related lethal concentration curves to be compared with the IC50 values for different incubation times in vitro. The results were presented and analysed in a series of 50 MEIC Monographs - therefore the sub-project was called MEMO. The MEMO work has not only reformed in vitro toxicology research, but also have improved clinical toxicology as well as forensic medicine by providing more precise reference data.

The results from the MEIC-project demonstrated a high relevance of human cell line tests for predicting human acute toxicities of chemicals. It also showed that other important toxic mechanisms exist, which might only be measured by supplementary in vitro toxicity tests. Furthermore, it showed that modelling of human toxicity is improved by additional toxicokinetic data, obtained from new in vitro kinetic tests. These results encouraged Björn Ekwall to initiate a new multicentre programme, EDIT (Evaluation-guided Development of In Vitro Toxicity and Toxicokinetic Tests). This project aimed at developing adequate supplementary toxicity and kinetic tests, to improve and extend the prediction of the original MEIC battery.

In 1996 Björn decided to leave Uppsala with his wife Barbro and settle in Gotland a Swedish island in the Baltic Sea. From his house in the southern part of the island Björn continued to work with the EDIT project until his death. During the last years the work of he has been more and more general accepted and appreciated also by earlier critics. In October 2000, the National Institute of Environmental Health Sciences in the US arranged a conference (the International Workshop on in vitro Methods for Assessing Acute Systemic Toxicity). The aim of this workshop was to assess the current status of in vitro test methods for acute systemic toxicity testing, and to develop recommendations for future development and validation studies.

The workshop was very much focused on the results from the MEIC project. As background documents for the Workshop ICCVAM (the US Interagency Coordinating Committee on the Validation of Alternative Methods) listed 22 relevant studies. Out of these 22 articles Björn Ekwall had (co-)authored 21. This reflects very well the importance of the work of Björn Ekwall.

Björn received many international awards and was a member of many scientific societies and associations:

**Awards and prizes:**
- 1989 Recipient of Hjerrilds prize
- 1991 research award of the Swedish Foundation for Research without Animal Experiments
- 1994 Marchig Animal Welfare Award
- 1995 research award from Juliana Von Wendts Animal Protection Fund

Björn Ekwall was the (co-)author of 69 articles/book chapters on in vitro toxicology, plus 30 abstracts published in journals and another 30 abstracts "published" in conference proceedings (see publication list for Björn Ekwall). In the last years he also authored 65 MEIC Monographs on human time-related blood concentrations (fifty of these are published on the Internet - see the MEMO database).

from: http://www.cctoxconsulting.a.se / CTLU_björn_CV.html
Left: Osaka Castle,  Center: Osaka harbor,  Right: With his son (December, 1992)