

OBITUARY

Lars Å. (Nenne) Hanson (1934–2022): A Retrospective

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RETROSPECTIVE

Lars Hanson made early discoveries which formed an important part of the foundation for our field of mucosal immunology. In 1675, Isaac Newton in a letter written to fellow scientist Robert Hooke wrote “if I have seen further, it is by standing on the shoulders of giants”. Hanson’s discoveries, like all our subsequent advances, were similarly well founded on others’ prior achievements and insights¹ but his recent death deserves especially significant celebration and recounting of his career. In 1961, he received his M.D. from the University of Gothenburg. In the same year, he defended his Ph.D. on his studies of human breast milk in an exploration of the components which might be responsible in addition to nutrition for the baby’s health and development². He showed by classical gel immunodiffusion and immunoelectrophoresis techniques that there was a special and predominant recently discovered antibody class in breast milk that cross reacted with a serum counterpart immunoglobulin but contained additional antigenicity, indicating structural differences from it^{3–5}. His dissertation opponent said at the defense that Hanson’s observations were “biologically improbable”⁶. This new addition to the two known immunoglobulin classes at the time, gamma globulin G and β_{2M} , β_{2A} , was discovered shortly before by Heremans⁷ using differential precipitation with zinc sulfate and starch block electrophoresis – the imperfect techniques of the time. It was subsequently referred to as γ_A or γ_{1A} and in 1964 finally named IgA. Hanson’s surprising initial unique observations were subsequently amplified by Tomasi and colleagues^{8–10} including identification of the additional polypeptide “secretory piece/component”.



Credit: Lars Å. “Nenne” Hanson. 1934–2022

Hanson acquired further training in the laboratory of Henry Kunkel in 1962 at the Rockefeller. In Kunkel’s group at the same time were several individuals who themselves became luminaries in immunology including Franklin, Edelman, Muller-Eberhard. Tomasi was in the first stages of his Ph.D. studies there as was

Heremans, who failed to reproduce his own previous findings using the serum from two other postdocs in the lab: Rockey and Hanson¹¹. This was the first report of IgA deficiency in apparently healthy persons and an issue that concerned Lars Hanson personally and professionally for the rest of his career, as he continued to study the incidence and possible causes and importance of this and other dysgammaglobulinemias¹². After specialty training in Pediatrics and time in Stockholm, in 1965 he was appointed as a research Associate Professor in Immunology at the University of Gothenburg and in 1978, became the first Professor of Clinical Immunology in Sweden. In his continuing exploration of mammary secretory IgA, Hanson and colleagues realized that the most of this predominant antibody was directed against bacteria, particularly potential or actual pathogens in the gut¹³. It was a small step to conjecturing that sIgA might be coming from there to the breast in the form of actively synthesizing lymphocytes^{14,15} and shown conclusively to be so by Lamm and colleagues¹⁶ the concept of an entero- mammary axis was born.

Lars Hanson’s work gained him a large number of international and national prizes, including the Robert Koch in 1981 (Germany) and the Jahre in 1988 (Norway), and a more complete list of these together with further accounts of his achievements can be found in a symposium dedicated in his honor, held in 2019 and recently published¹⁷. During his career, he published more than 750 papers, wrote and edited 23 books, and supervised 79 doctoral and postdoctoral trainees, many of whom have themselves made outstanding contributions to immunology, vaccinology and microbiology.

Nenne Hanson was a pediatrician whose lifetime academic interests continued to embrace exploration of the complex and diverse factors that are responsible for both neonatal development and defense against infections. He was foremost a passionate promoter of the importance of breastfeeding and was a leading figure in the international efforts to promote and normalize breast feeding which by the 1960’s had lost favor in its routine practice in developed countries. Indeed, he received the Macy-Gyorgy prize in 2004 for his work⁶ and he was justly and widely celebrated internationally for bringing scientific evidence to bear and support these efforts. He worked extensively for decades in promoting the well-being of mothers and newborns/ children in underprivileged societies in the Gambia, Costa Rica and for several decades in Lahore, Pakistan. He showed how breastfeeding protected newborns against a multiplicity of infections, most especially those causing diarrhea and urinary tract infections (UTI) and consequently reduced very considerable

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morbidity and mortality¹⁸. In extensive studies over two decades, he and a series of trainees and colleagues brought crucial knowledge to the UTI field and established new understanding of the E coli that most often cause it. Several hundred of his trove of clinical research publications are devoted to these findings and their application to improve maternal and child health and the resulting evidence was the major influence in the World Health Organization's (WHO) global breastfeeding recommendations. Nenne also engineered a meeting with then Pope John Paul II (accompanied by Ray Ogra, one of the current authors) and appealed for and received papal pronouncement in support of breastfeeding. He was extensively involved in establishing governmental and international support not only of his own work but that of others by organizations such as the WHO, UNESCO, and the Swedish and British Medical Research Councils, and he worked extensively with *Medicins sans Frontieres*. He proved to be a giant in his own time by fostering through his tireless clinical and scientific work the social, health and economic improvement in whole populations of mothers and babies. This work and that of his trainees and colleagues has culminated in major significant cultural changes and acceptance of the importance of breastfeeding for our offspring. As one small example of the importance of his work and its promulgation, and in large part for his respect for Costa Rica's redistribution of governmental resources to support public health measures (including breastfeeding), for 5 years he publicly promoted the notion that the country should be awarded the Nobel Peace Prize. This was indeed awarded in 1987¹⁹. He received in turn the title of permanent Honorary Consul to that country in his hometown of Gothenburg.

Nenne Hanson played a leading role in the development of immunology from his student days and early training as a pediatrician to his retirement as an academic professor in 2000 and even beyond. He brought creativity and humanity to the generation of new scientific ideas and their application to the practice of medicine and changes in governmental policies to many aspects of our cultures. He was a remarkable and humble man, full of fun and commitment to students and trainees and generous of his time to all who sought it. With his lifetime efforts to foster breastfeeding and the importance of mothers' milk, he was a true friend to the world's children in the rapidly changing modes of infant nutrition. He is and will be missed by his many colleagues and friends all over the world and his contributions will continue to be celebrated. Above all, he is much missed by his wife Monika, an acclaimed journalist and his lifelong support, and also their children, Bjorn and Petra with their respective families.

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ADDITIONAL INFORMATION

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