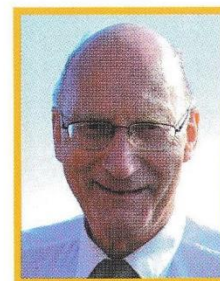


Second KIA Laureate Applied Research



- ◆ **Researcher:** Prof. Per Brandtzaeg
- ◆ **Nationality:** Norway
- ◆ **Date of birth:** 1936
- ◆ **Position:** Professor / Medical Researcher
- ◆ **Scientific affiliation:** Laboratory for Immunohistochemistry

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Project title: Basic studies of mucosal immunity to promote the fields of vaccinology and immunotherapy in human medicine

Abstract: Our mucosae are the interface between the contaminated external milieu and our uncontaminated tissues, thus being an enormous battlefield. How a specialized anti-inflammatory defense system can operate outside the mucosal surface was discovered by the applicant. He defined how immune exclusion of pathogens is accomplished by luminal transport of secretory immunoglobulin A (SIgA) and SIgM antibodies in a co-operation between mucosal B cells and secretory epithelia. His discovery was published in seminal articles in *Science* and *Nature*, and is fundamental to our understanding of mucosal homeostasis. SIg transport is mediated by a receptor first shown by the applicant to be an epithelial glycoprotein called secretory component (SC), now often referred to as pIgR. The local plasma cells produce J chain, which is incorporated into dimeric IgA and pentameric IgM. Only these two pIgs can bind to SC/pIgR. Thus, SIgM antibodies compensate for SIgA in IgA deficiency. The human gene encoding SC/pIgR was cloned and sequenced by the applicant's team, and was demonstrated to be upregulated by cytokines. The regulatory DNA elements have been defined. The functional importance of the transport model for mucosal homeostasis was experimentally proven *in vivo* when the applicant first succeeded in generating knockout mice deficient in SC/pIgR.

Biography: Prof. Per Brandtzaeg obtained his postgraduate training in microbiology, immunology and pathology at the Medical Center, Univ. of Alabama at Birmingham, AL, USA (1962-64) and received his PhD in immunology at the Univ. of Oslo (1971). He is the former Head of the Faculty Division, Rikshospitalet University Hospital, Oslo, and the founder (1965) of the Laboratory for Immunohistochemistry and Immunopathology (LIIPAT), Institute and Department of Pathology, which is devoted to research on mucosal immunity. He is also the founder (2001) of a thematic research network called the Center for Vaccinology and Immunotherapy (CEVI) at the University of Oslo, with a focus on basic mechanisms of importance for active and passive immunization. In 2007, CEVI obtained status as a Center of Excellence funded by the Research Council of Norway. Prof. Brandtzaeg's main research interest is in the immunobiology and immunopathology of mucous membranes. He obtained the top score of leading European scientists in the field of mucosal immunology in a worldwide peer judgement carried out by the US National Academy of Sciences Immunology Benchmarking Panel in 1998, and has been Norway's most cited researcher over the last two decades. He has received several major national and international science awards, and is Commander of the Royal Norwegian Order of St. Olav.