INTRODUCTION

In 1994, I was approached by my colleague and friend Professor Renato Cordeiro to consider organizing an international symposium on the eosinophil in Brazil in 1996. The purpose of the meeting was to address the enigma of contrasting roles of the eosinophil in allergic inflammation and asthma on the one hand and parasitic infections on the other. This was very appealing, since this question has been one which I have been interested in for many years. The symposium took place between June 3-6, 1996, in beautiful Rio de Janeiro with approximately 300 participants from most continents of the world. I was delighted with the support and enthusiasm of my colleagues who participated in this symposium. The generosity and hospitality extended to us by our Brazilian colleagues and the hard work of the staff of Fiocruz, particularly those associated with Dr Cordeiro's group who contributed tremendously to the friendly nature of this gathering are deeply appreciated. The scientific content of the meeting, presented by many leaders in the field of eosinophil research made this symposium unique and very informative. The discussions around each presentation and the final concluding session helped to further our understanding of the complex nature of the eosinophil as one of the most prominent cell in IgE-mediated inflammatory reactions. The as yet unproven premise that the eosinophil has been retained in evolution as part of IgE-dependent immune mechanisms because it plays a role in adaptive immunity against worms remains very attractive. Ironically, parallel evidence in asthmatic inflammation for an effector role for eosinophils remains circumstantial. As research in this area continues, we may be in a better position to determine more precisely the role of this cell in health and disease.

Heartfelt thanks are due to my friend and co-chairperson of the symposium Renato Cordeiro for his unbounded energy, remarkable organizational acumen, and generosity. We are both grateful to all the speakers at this conference for their participation and their review chapters published in this volume. None of this would have been possible without the generous financial and moral support of many funding and academic institutions. In particular, the Fundação Oswaldo Cruz (Fiocruz), Ministry of Health, the British Council and a number of other industrial and academic institutions in Brazil. We wish also to express our gratitude for sponsorship by a number of pharmaceutical firms including Astra Pharma, Inc., Canada, Glaxo-Wellcome, UK and Schering Plough, USA and the support of the Pulmonary Research Group, University of Alberta, Canada.

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FOREWORD

It is well over a century since Paul Ehrlich was credited with the first recognition and description of the eosinophil as a distinct type of leukocyte. The eosinophil's distinguishing feature then was its affinity for staining with acid aniline dyes, such as eosin, a property that accounts for its name. We now know that dyes such as eosin bind to cationic proteins in eosinophil specific granules, granules whose ultrastructural morphology is unique because of their content of crystalloid cores rich in major basic protein. Curiously, there has been no singularly eosinophil-specific cell surface marker recognized to date; and the identifying features of eosinophils principally remain their morphologic and tinctorial properties visible by light microscopy and their granule ultrastructure visible by electron microscopy. The eosinophil is not unique to mammals but extends, at least based on ultrastructure, well into more primitive animals, including reptiles.

What are the functions of this phylogenetically conserved leukocyte? Answers to this question and even more compellingly to questions about the roles of eosinophils in human diseases associated with eosinophilia, including allergic and parasitic diseases, have prompted a sustained series of studies over the last century. In the 1960's, a couple of research groups began to link eosinophil production with lymphocytes. Major amongst these groups was that headed by Paul Beeson, MD, then at Oxford. In a series of classic studies, Beeson's group established the lymphocyte dependence of heightened eosinophil production (A Basten & PB Beeson 1970. Mechanism of eosinophilia. II. Role of the lymphocyte. *J Exp Med 131:* 1288-1305). These studies, based in part on unnatural intravascular adminstration of *Trichinella* larvae in the rat, presaged the later recognition by Sanderson of IL-5 as a major eosinophilopoietic cytokine and helped set the stage for resolving lymphocyte functioning into subsets, including Th1 and Th2 subsets.

Dr Beeson brought to his investigations a broad clinical and scientific knowledge. He was well aware of the disease associations of eosinophilia. He remembered the time when lymphocytes were ill-understood and recognized simply as a unitary type of small compact mononuclear leukocytes. Modern immunology has refined, and continues to delineate, the functional diversity and complexity of lymphocytes, despite their nominal morphologic similarity and simplicity. Dr Beeson, a pioneer in laying the ground-work for much of our current studies of eosinophils, has wondered whether the morphologic unity of eosinophils belies a greater diversity of functions for this distinct leukocyte analogous to what has been revealed for the lymphocyte. What are the evolutionary benefits to having eosinophils? A potentially beneficial role in the host-defense against principally multicellular helminthic parasites has been questioned based on small animal studies ablating eosinophilia with anti-IL-5. Concurrently, increasing evidence has accumulated linking eosinophils to the pathophysiology of asthma and allergic diseases. What then is the evolutionary benefit for this cell type associated with morbidity and mortality as in asthma? More immediately, how can we understand and therapeutically intervene to control the deleterious actions of eosinophils in such diseases? Are there roles for eosinophils in immune or other responses where there are not obviously increased numbers of eosinophils?

There are many questions one may still raise about the scope of eosinophil functions, but there are also continuing new insights concerning eosinophils. The International Symposium on Eosinophils in Allergic Inflammation and Parasitic and Infectious Diseases, held in Rio de Janeiro, Brazil in 1996 under the auspices of the Minister of Health of the Foundation Oswaldo Cruz and the Institutue Oswaldo Cruz, convened a multitude of international investigators who have been contributing to defining the functions of eosinophils. The proceedings of these meetings provide highly contemporary information on a broad range of related topics pertinent to eosinophils. Much has been learned. New methods, new molecules and new insights have been identified. All answers are not yet in, but the new knowledge reflected in the contributions at this Symposium provides valuable advances in our ongoing investigations of eosinophils and sets the stage for yet further advances in our understanding of the roles and functions of this curious minority leukocyte.

Peter F Weller, MD

Organizer