

## CLINICAL APPLICATION OF NERVE GROWTH FACTOR ON HUMAN CORNEAL ULCER

A. LAMBIASE<sup>1,4</sup>\*, L. MANNI<sup>2</sup>, P. RAMA<sup>3</sup> AND S. BONINI<sup>1,4</sup>

<sup>1</sup>*Interdisciplinary Center for Biomedical Research (CIR), Laboratory of Ophthalmology, University of Rome  
"Campus Bio-Medico"*

<sup>2</sup>*Institute of Neurobiology, National Research Council, Rome*

<sup>3</sup>*Division of Ophthalmology, Hospital of Milan "San Raffaele"*

<sup>4</sup>*G.B. Bietti Eye Foundation, Rome*

### INTRODUCTION

Corneal transparency is essential for the maintenance of visual function and is contingent on the flawless integrity of all its components: the epithelium, stroma and endothelium (1). Disruption of the epithelial anatomical barrier activates healing and remodeling processes, which can predispose the tissue to stromal ulceration and/or cause stromal opacity, ultimately leading to irreversible visual deficit (2). Epithelial/stromal integrity is compromised by any insult to the ocular surface: infection, trauma, chemical burns, contact lens wear, topical drug abuse, and post-operative damage (3). Indeed, the key role of corneal sensory innervation in corneal trophism and recovery after injury is well known (4). Despite numerous studies completed in recent years which have indicated that cytokines, growth factors and neuropeptides may influence the epithelial healing process *in vitro*, a suitable therapeutic approach to modulate the healing process has not yet been defined (5, 6).

It was recently shown that nerve growth factor (NGF) plays a crucial role in corneal trophism and in the healing process after corneal injury.

### EXPERIMENTAL DATA

Nerve growth factor (NGF) is an endogenously produced molecule essential for the survival and growth of sympathetic and sensory neurons and for differentiation of neurons in the central nervous system (7). NGF induces neurite sprouting by neural cells and restores the function of injured neurons (7-9). In the past few years several studies have focused on the role of NGF in the pathophysiology of the posterior segment of the eye (retina and optic nerve). Recently our group has highlighted the important function of NGF in the anterior segment of the eye (cornea and conjunctiva). We reported, for the first time in 1995, the potential activity of NGF in the pathophysiology of the ocular surface demonstrating that NGF plasma levels were

---

\* Address for correspondence: Alessandro Lambiase, MD, Interdisciplinary Center for Biomedical Research (CIR), Laboratory of Ophthalmology, University of Rome "Campus Bio-Medico", Via Emilio Longoni 83, 00155 Rome, Italy. Tel. +39 06 22541342, Fax +39 06 22541456, E-mail: a.lambiase@unicampus.it

