

## ACCEPTANCE SPEECH

By

**GÜNTER BLOBEL**

Co-Winner of the 1996 King Faisal  
International Prize for Science

Your Royal Highness Prince Sultan ibn Abdul Aziz,  
Your Royal Highnesses,  
Your Excellencies,  
Distinguished Guests,

It is a great pleasure to accept the 1996 King Faisal International Prize for Science and to share it with my distinguished colleagues and friends Hugh Pelham and James Rothman.

The King Faisal International Prize for Science continues the great tradition of Muslim patronage of science and scholarship that began centuries ago under the Islamic caliphs. It led to a renaissance of the sciences centred in the Islamic world and a tremendous expansion of human knowledge. At a time when Europe was in the dark ages, scientists in the Islamic world made profound contributions to mathematics, physics, chemistry, and medicine. Muslim scientists were valued not only for their investigations of practical problems in astronomy and medicine, but also for their theoretical insights into various fields of knowledge. They were welcomed and supported in their own countries of birth and in other parts of the Islamic world. Ibn Sina, known in the West as Avicenna, although born in Central Asia, had an international career in the central lands of the Islamic Empire. One can say that his career also encompassed Europe in that the translation of his great *Canon of Medicine* remained the most definitive textbook of medicine in Europe for 500 years. Scientists today resemble their Muslim predecessors in being true international citizens of the world.

At the times of Ibn Sina it was not known that the cell is the basic unit of life. This knowledge was acquired only a hundred years ago. And only 50

years ago, using electro microscopy, was it discovered that the cell is organized into many distinct compartments, each performing different functions. These functions are carried out by thousands of proteins specifically localized to these compartments. My work has dealt with the problem of how proteins are directed to these specific cellular addresses. We first postulated that, like the mail, proteins are distributed to distinct cellular compartments with the help of a zip code that is tagged on each protein. Of course, distribution of a protein to each of the cellular compartments would require a different zip code, very much like the distribution of a letter to a city employs a city-specific zip code. Indeed, cell compartment-specific zip codes could be identified. Moreover, the machineries which recognize the various zip codes and allow transport of proteins to their specific cellular compartments were isolated and characterized. Errors either in the zip code or malfunctioning of the corresponding zip code recognition machineries lead to protein mislocalization which, in turn, has been shown to be either incompatible with life or to result in a number of diseases, including cancer.

This knowledge will help to develop rational cures for these diseases.

It is a very great privilege to receive The King Faisal International Prize for Science. Without the inspiration from my brilliant teacher George Palade and from many outstanding graduate students and post-doctoral fellows who collaborated with me, I would not have been able to accomplish the work for which I am honoured. I extend my profound thanks to them and to The King Faisal Foundation for recognizing this work.