Guest editorial

In this edition of the *AGE* journal, we wanted to focus our attention on a forgotten and unattended organelle in the field of biogerontology, the plasma membrane. The plasma membrane could be the most essential organelle for the integrity and viability of all cells. Cells can survive for diverse periods of time without mitochondria, nuclei, endoplasmic reticulum, Golgi, lysosomes, but the viability of the cell will terminate as soon as their plasma membrane loses its integrity. This membrane represents the boundary between the generally constant and controlled internal environment and the variable, always changing, external environments. As such, it is the first line of transduction of information between the cell and its environment. Because of its composition and location, the plasma membrane is vulnerable to a wide variety of external insults including reactive oxygen species. Thus, the plasma membrane, throughout the life of the organism and cells, has to be capable of maintaining and preserving signalling cascades of information, enabling the cell to respond as a whole, and also maintain its components in the appropriate functional redox state. Plasma membrane receptors are a major source of signalling that require in some instances a redox regulation to establish the flow of information. Probably in part for this purpose, the plasma membrane contains a redox system that when driving electrons through the bilayer must be able to regulate the redox state of antioxidants and, as a

consequence, the optimal state of lipids and associated proteins. This redox system is constituted mainly by NAD(P)H-dependent coenzyme Q reductases. This system is somehow integrated with the redox environment of the mitochondria and it can cooperate with this organelle to regulate the redox homeostasis of the cell. A collapse of this redox equilibrium will evoke the activation of the apoptosis pathway either starting at the plasma membrane or the mitochondria. In summary, this special section in *AGE* is designed to spark research interest in the regulatory mechanisms involved in the plasma membrane function related to redox homeostasis and survival of eukaryotic cells as a highly important mechanism of aging in all organisms.

Rafael C. de Cabo
Laboratory of Experimental Gerontology
NIA, NIH
Gerontology Research Center
Box 10, 5600 Nathan Shock Dr.
Baltimore, MD 21224-6825, USA
E-mail: decabora@grc.nia.nih.gov

Plácido Navas
Centro Andaluz de Biología del Desarrollo
Universidad Pablo de Olavide
Carretera de Utrera Km 1
41013, Sevilla, Spain