
Contents

Acknowledgements.....	VI
I. Introduction - Rationale for the Use of Cell Culture in Gerontology Research.....	1
II. Relationship between the Behavior of Cells in Culture and the Physiopathology of the Organism.....	6
1. Development, Aging, Disease and the Potential to Divide in vitro...	6
2. Aging, Cancer and the Life Span of Cells in vitro.....	14
3. The Division Potential of Cells in the Organism.....	20
III. Putative Mechanisms Responsible for the Different Growth Potential of Somatic Cells.....	22
1. Reorganization of the Genome.....	22
2. Search for Nuclear and Cytoplasmic Determinants of the Growth Potential.....	45
a. Fusion products between cells with different growth potentials	45
b. DNA Repair.....	51
c. Protein Metabolism.....	60
d. Free Radicals.....	74
e. Mitochondria.....	80
IV. Dynamics of the Loss of the Proliferative Potential during Cell Senescence.....	83
V. Analogy between Changes in the Kinetics of Cell Proliferation and Metabolic Events.....	94
1. Progressive events.....	95
2. The Terminal Stage (Phase IV): Degeneration or Differentiation?..	111
VI. Cell Cycle-Related Events during Growth Decline.....	135
1. Contact Inhibition of Growth.....	135
2. Commitment to Divide.....	141
a. Initiation of the Division Cycle.....	142
b. DNA Synthesis.....	156
c. The G ₂ Period.....	157
d. Mitosis.....	163
VII. Heterogeneity of Fibroblast-Like Populations.....	165
VIII. Envoi.....	171
IX. References.....	173
Subject Index.....	213