Aging and longevity control of biological systems via drugs – a reliability model

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The treatments or cures in bio-systems correspond to respective maintenance or repairs known in reliability theory: [1], [2], [4]. Some treatments may make the biological objects younger; others may make them older, or not deteriorate their current age. Such kind of “maintenance” has some analogous failure/repair models in reliability [3]. We use it to incorporate some results of reliability and bio modeling for the quantitative studies of the aging and resistance of bio-systems to environmental stress factors. We call “calendar age” the age of a bio-object which does not use treatments, or uses it without age improvement, or deterioration. All bio-objects, which are using treatments of same strength and direction of effect, have a “virtual age”. We explain here what the virtual age is, and how it is related to age correcting factors. We illustrate our common results about the virtual ages on the example of the Gompertz-Makenham law of mortality [5], and discuss the relations of the longevity, mechanism of aging and age affecting control. As a consequence, a concept of age determination is proposed. Numeric and graphical examples are provided.