

# Anti-Aging Medicine and Science: An Arena of Conflict and Profound Societal Implications

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*An international group of more than 50 biogerontologists—scientists who conduct research on the biology of aging—have launched a war on a burgeoning anti-aging medicine movement. They seek to discredit what they regard as the pseudoscience of practitioners and entrepreneurs that purvey hormone injections, special mineral waters and other services and products purported to combat the effects of aging. Yet, an unintended consequence of the biogerontologists' campaign against anti-aging medicine is that they are diverting attention from the potentially radical societal implications of their own anti-aging efforts—implications that should be widely discussed in nations throughout the world.*

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In the spring of 2002, an international group of 52 biogerontologists—scientists who conduct research on the biology of aging—launched a war of words to discredit a burgeoning anti-aging medicine movement.<sup>1</sup> They issued a lengthy consensus position statement on *The Truth About Human Aging*,<sup>2</sup> accompanied by an article in *Scientific American* entitled *No Truth to the Fountain of Youth*.<sup>3</sup> Moreover, they arranged for this position statement to be published in journals throughout the world.<sup>4</sup> Subsequently, the conveners of the group have facetiously issued “Silver Fleece Awards” to anti-aging products and organisations.<sup>5</sup>

The biogerontologist's enemy in this war is what they regard as the pseudoscience of practitioners and entrepreneurs who purvey hormone injections, special mineral waters and other services and products purported to combat the effects of aging. One of their prime targets (a 2002 winner of the Silver Fleece Award) is the American Academy of Anti-Aging Medicine (A4M), which board-certifies practitioners and claims 11,000 members in 65 nations.<sup>6</sup> A4M's website displays numerous advertisements for anti-aging products and services, clinics and practitioners. It also has

an A4M Longevity Store where memberships to A4M are sold as well as books authored by the organisation's president, such as *Ten Weeks To a Younger You*.

Yet, even as biogerontologists are attacking the contemporary anti-aging medicine movement, many of them are themselves trying to develop interventions that will dramatically slow or arrest the fundamental processes of aging. In fact, an unintended consequence of their war on anti-aging medicine is that it is diverting attention from the potentially radical societal implications of their own anti-aging research efforts—implications that should be widely discussed in nations throughout the world.<sup>7</sup>

## Why the War on Anti-Aging Medicine?

What is this recent effort to discredit anti-aging medicine about? After all, measures promoted as anti-aging interventions have been part of human culture and societies for millennia, with their criticisms waxing and waning over the centuries.

On the surface, the position statement and associated articles can be seen as part of a larger public health effort to educate health professionals and the public regard-

ing harmful and misleading aspects of anti-aging interventions and claims. Primarily, however, the war on anti-aging medicine is an attempt by established gerontological researchers to preserve their hard-won, but still fragile, scientific and political legitimacy which took many years to achieve, as well as to maintain and enhance funding for their research on the basic biological mechanisms of aging. As such, this war is “boundary work” that parallels disputes in many other areas of science in which rhetorical demarcations are employed to maintain legitimacy and power.<sup>8</sup>

## The Ongoing Struggle for Legitimacy

Gerald Gruman has noted that throughout most of human history efforts to achieve prolongevity (significant extension of the life span and/or average life expectancy) have tended to be “relegated to a limbo reserved for impractical projects or eccentric whims not quite worthy of serious scientific or philosophic consideration.”<sup>9</sup> Until recent decades, this observation fit rather well the perceptions of biological research on aging held by many in the scientific community.<sup>10</sup> As a history of U.S. biogerontology put it only 20 years ago: “Those who would study aging in order to retard or halt the process have been considered on the fringe of biomedical research, looking for the fountain of youth... a marginal area... with so little backing from the scientific community.”<sup>11</sup> The present effort of gerontologists to downplay “the fountain of youth” can be understood best in this historical context.

The creation of a National Institute on Aging (NIA) at the U.S. National Institutes of Health (NIH) in 1974, however, provided for worldwide biogerontology the kind of institutionalisation that confers scientific stature and power,<sup>12</sup> legitimating it as more of a “mainstream” subject for biomedical research and as an appropriate area in

which to invest sizable amounts of public funds. Since then, a number of important scientific frontiers have been opened up in biogerontology.<sup>13,14</sup>

Nonetheless, the image of biogerontology as a legitimate and mainstream scientific pursuit is still vulnerable enough to be threatened by the anti-aging medicine movement. The position statement by the 52 scientists acknowledged, "Our concern is that when proponents of anti-aging medicine claim that the fountain of youth has already been discovered, it negatively affects the credibility of serious scientific research efforts on aging."<sup>4</sup> Similarly, the founding director of NIA, Robert N. Butler, recently observed, "Unfortunately, anti-aging medicine is often confused with serious research. Consequently, public and private philanthropic organizations are less interested in funding serious aging research..."<sup>15</sup> As these comments imply, the war on anti-aging medicine is being waged primarily so that the image of research on aging will not become blemished once more. Biogerontologist Leonard Hayflick, one of the conveners of the 52 scientists' position statement, and regarded by many in the field as having laid the groundwork for contemporary research advances in molecular mechanisms of aging, explains the group's motivation in an extremely cogent fashion: "After some 25 years of legitimizing the field of biogerontology, it is our responsibility to maintain that legitimacy so that public support for research that advances understanding of the fundamental biology of aging and longevity determination will be sustained and enhanced."<sup>1</sup>

### The Pursuit of Prolongevity

Simultaneously with this attempt to establish a boundary between anti-aging medicine and "legitimate" research on aging, the efforts of many biogerontologists to achieve dramatic anti-aging interventions continue unabated, encouraged by public scientific institutions like NIH. In 1999, for example, two NIH institutes jointly convened a working group of over 50 scientists to explore the possibilities of applying to humans the prolongevity affects that have been achieved in caloric restriction

experiments with laboratory animals.<sup>16</sup> The group produced a substantial agenda of opportunities for research on human implications, including the goals of slowing fundamental processes of aging and extending maximum human life span. This fit right in with one of the priorities declared by NIA in its current official strategic plan, which is to "unlock the secrets" of aging, health and longevity, including the identification of factors that "slow the clock" of aging.<sup>17</sup> In line with this goal, some biogerontologists are now working on the development of pills that could mimic the anti-aging effects of dietary caloric restriction.<sup>18,19</sup>

The accomplishment of this agenda to slow the fundamental processes of aging, to achieve decelerated aging, would not only delay age-associated pathologies but also greatly increase both average life expectancy and maximum life span beyond the prior experience of our species. Biogerontologist Richard Miller of the University of Michigan suggests that an effective anti-aging intervention to achieve decelerated aging "might increase the mean and maximal human life span by about 40%, which is a mean age at death of about 112 years for Caucasian American or Japanese women, with an occasional winner topping out at about 140 years."<sup>18</sup>

A more radical prospect is championed by other biogerontologists, led by Aubrey de Grey of the University of Cambridge. They hope to achieve arrested aging by continually restoring vitality and function through reversal of the processes of aging as they occur in adults, thereby removing the damage inevitably caused by basic metabolic processes.<sup>20</sup> de Grey and his colleagues expect that substantive progress toward this objective will be feasible within about a decade,<sup>20</sup> and he asserts that it is "inevitable, barring the end of civilization, that we will eventually achieve a 150-year mean longevity."<sup>21</sup>

### Confronting Implications of "The Impossible"

As improbable as any of these aspirations may seem at present, developments in science—such as the cloning of mammals—can catch society unawares by

accomplishing what seemed to be "The Impossible".<sup>22</sup> Consequently, it is none too soon to undertake anticipatory deliberations concerning issues generated by the potential consequences of the anti-aging interventions being pursued by biogerontologists.

If dramatic increases in healthy life expectancy and life span become feasible, how should the interventions that achieve them be allocated in society? Serious ethical issues would be created if the interventions were not universally available, but allocated in accordance with wealth, social and political status, ascribed "merit" or some other distinguishing criteria. Alternatively, if access to effective anti-aging interventions were unlimited, radical societal changes would take place in the nature of the labour and housing markets, family life, politics and public policies, the law and almost every social institution.

These and other potential consequences of effective anti-aging interventions have much more profound and far-reaching implications than other current biomedical policy issues, such as the ethics of human cloning. If biogerontologists succeed in their aspirations to decelerate or arrest aging, the consequent transformations in the nature of individual and collective life may well be radical. Yet, they have rarely been addressed to date,<sup>22-25</sup> and not in forums that reach a wide public.

We need to begin widespread public discussions of the implications of achieving decelerated and arrested aging. Public institutions such as the U.S. NIH are already supporting anti-aging scientific research that could lead to such outcomes. Now, it is time for biogerontologists who are engaged in this research to undertake more active leadership in helping the public to understand their goals and to deliberately consider the implications of their fulfillment. Through such discussions we may be able to shape wisely the future of developments in anti-aging science and their social consequences. In the long run, leadership by biogerontologists in such an effort would be an even greater service for all of us than their current war on contemporary anti-aging products and therapies. ♦

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