American Federation for Aging Research

Harvey Jay Cohen, MD, AFAR’s President and Director of the Center for the Study of Aging & Human Development in the Department of Medicine, Duke University, sheds light on geroscience, the benefits afforded by investigating cancer and ageing research simultaneously and the Federation’s programmes to support research training.
What pressures has ageing placed on healthcare systems and resources in America? How is the American Federation for Aging Research (AFAR) looking to support and advance healthy ageing?

Currently, around 40 million Americans are over 65, and by 2030 those numbers are expected to grow to more than 72 million. With this comes the rising incidence of age-associated disease and its attendant personal, social and economic costs. Largely as a result of this trend, healthcare spending is expected to increase by 25 per cent by 2030, and Medicare spending will grow from US $555 billion in 2011 to $900 billion in 2020.

The medical literature has presented evidence of the health benefits of delayed ageing, and animal studies have shown that the ageing process is inherently modifiable. By supporting scientists who study and pursue paths to delay the effects of ageing, AFAR hopes to realise this promise and help a significantly larger number of people to reach and pass the age of 65 in much better health. Delaying ageing has both medical and economic benefits: by sustaining our healthier years, Medicare spending is projected to be lower.

In the context of the ageing population, which scientific and technological advances are you most excited about?

The field is poised to unlock many of the mysteries of ageing, especially the underpinnings of ageing with regard to chronic disease. Chronic inflammation, cellular senescence and other fundamental mechanisms of ageing could be at the nexus of chronological ageing and the diseases responsible for the most deaths, morbidity and healthcare costs in our society. AFAR-supported scientists and researchers are on the cusp of discovering ways to target the basic ageing mechanisms that could ameliorate age-related diseases. These interventions still need to be thoroughly tested in disease-specific animal models.

What scientific exchange, collaborative and funding opportunities does AFAR provide for researchers?

AFAR offers various grant programmes in an effort to grow the pipeline in ageing research and support investigators at various stages in their careers and research, from our AFAR Research Grants for Junior Faculty to our Paul Beeson Career Development Awards in Aging Research Program to sustain and promote the research careers of clinically trained individuals who are pursuing research careers in ageing. Since 1981, AFAR has provided more than $140 million to support to over 3,500 scientists. In addition to operational funding, many of these grants offer a mentorship capacity and the opportunity to attend meetings to present research, share knowledge and exchange ideas to drive innovation in ageing research.

Could you discuss the significance of geroscience – an emerging area of science which focuses on ageing and age-related disease?

Geroscience starts with the fact that many of our diseases, especially chronic diseases, are heavily age-related, or, to put it another way, ageing is the major risk factor for most of them. So if we study the basic underlying biology of ageing and discover how to modify or alter it, we can have a far greater impact on a variety of age-related diseases than we would if we attacked each disease individually. Importantly, this would help us increase the healthspan – the number of years of good health – in an individual’s life.

Cancer is a useful example because it is often considered an age-related disease. Geroscience gives us the chance to see what ageing research can learn from cancer research and vice versa. The benefit holds true for other diseases as well, such as arthritis and heart disease. A lot of heart disease research now is looking at cardiac stem cells, how they proliferate and how they could be part of the renewal process to reverse heart disease. In my opinion, that sounds a lot like ageing research.

Another important goal of the geroscience initiative is to increase awareness and encourage a more collaborative approach. If investigators working in ageing and investigators in cancer, diabetes, and other conditions take a collaborative, multidisciplinary approach, we will be more successful.

Alongside the Gerontological Society of America (GSA), AFAR recently co-sponsored a special issue of the Public Policy & Aging Report, titled ‘The Longevity Dividend: Geroscience Meets Geropolitics’. What does this report set out to achieve?

In the report, contributor Gordon Lithgow of the Buck Institute’s Interdisciplinary Research Consortium on Geroscience declares that: “Ageing is the single greatest challenge for biomedicine in the 21st Century, and […] age-related diseases increasingly represent a true national emergency”. Geroscience offers an exciting new response to this enormous challenge.

The promise of geroscience lies in its tremendous potential impact in other disease areas, including diabetes, arthritis, Alzheimer’s disease, heart failure, atherosclerosis, cancer and kidney disease. Non-disease-specific but important conditions such as chronic inflammation are also associated with ageing and will benefit greatly from breakthroughs in ageing research. Until recently, this had not really dawned on many researchers focused on organ system diseases.

One misconception that AFAR and other supporters seek to dispel is that funding for geroscience will mean taking money away from other fields, such as cancer research, and moving it to ageing research. This so-called zero sum game is not the goal – or the reality – at all. We want to help researchers in many fields appreciate the fact that basic ageing research can help them better understand what they do, and promote a collaborative approach to realise its application in a host of other endeavours.

According to the National Cancer Institute, nearly 70 per cent of cancer deaths occur in people over 65. How is AFAR contributing to cancer research?

AFAR has supported ageing and cancer research throughout the years because they are, in many respects, two sides of the same coin. Tissue renewal and repair is ongoing in our bodies, and this is normal. The diminishing of the renewal process leads to ageing and, most importantly, functional decline. On the other hand, if cell proliferation becomes uncontrolled, you develop cancer.
The process of cell senescence, in which older cells that have been damaged or stressed stop dividing, offers some protection by stopping the proliferation of cancer cells. But we also know that having too many senescent cells can contribute to chronic low level inflammation that many people develop as they age, which can also cause cancer. We can’t suppress inflammation entirely, because it also has an important role to play in healing infections and wounds. A promising area of research centres on the possibility of selectively removing senescent cells, perhaps through a targeted drug. Whether or not this work becomes labelled as ageing research, it could have a major impact on our approach to cancer management.

Does cancer behave differently in older people? Should treatment options vary depending on age groups?

Cancer may respond differently in older patients than younger ones. Leukaemia (particularly AML leukaemia), for example, is the most common type among older people, but is also much more drug resistant and thus less responsive in older patients. They may also have less physical reserve to cope with highly toxic treatments. Breast cancer, on the other hand, tends to be less aggressive in older people, but often has poor survival and outcomes due to the patients’ diminished reserve capacity to respond to stress or threats.

My own research, which is mostly clinical these days, focuses in part on the role of a comprehensive geriatric assessment for older cancer patients who may react poorly to highly toxic cancer treatments because they have less physiological reserve and often more comorbidities. We want to optimise their treatment experience, design more targeted regimens with less toxicity. Because older people do respond differently – and because there is enormous variability between individuals – we need better tools to understand this heterogeneity and its implications for the individualised treatment management for a given patient. Geriatric assessment may be one of them.

We also need to nurture a population of researchers with both geriatrics and oncology backgrounds. This also means including more basic geriatrics information of relevance to oncologists in the curricula, syllabi and their boards. AFAR’s online resource (InfoAging.org) provides oncologists, as well as general consumers, with a scientific background of the relationship between ageing and cancer.

All doctors want to give cancer patients the best treatment options available, but too often, in the case of older patients, there isn’t sufficient evidence and the guidelines are not age-specific. We are working to generate this evidence at every level and that is something that AFAR is very interested in supporting.

As President of AFAR, what are your hopes for the organisation at this exciting time in the field?

It’s an exciting time for the field of ageing research across the board, from basic to scientific to clinical research and AFAR is taking the lead not only in supporting basic ageing research, but also translating these basic scientific findings into better clinical care for older adults.

This goes back to AFAR’s earliest days: its founder, Irving S Wright, MD, was a clinician whose goal was to improve people’s lives. Basic research is important in that regard but we cannot and should not ignore the clinical aspects of research as well. We are very excited about the new Glenn Foundation/AFAR Postdoctoral Fellowship Program for Translational Research on Aging which funds exactly this type of work.

We also have a vital need to continue to train investigators (both early and advanced in their careers) who can address these problems at each level, and AFAR has a number of excellent programmes that support them, including our Medical Student Training in Aging Research (MSTAR) Program that introduces students to geriatrics under the mentorship of top experts in the field, and our ongoing Glenn/AFAR Scholarships for Research in the Biology of Aging that give students enrolled in MD, DO, PhD or combined degree programmes the opportunity to conduct a three-to-six month research project focused on biomedical research in ageing. To advance these goals, I would like to see AFAR continue to attract additional funders who are interested in all aspects of the research sequence.