

## **BTS Congress 2018**

**The Regulatory Toxicology Speciality Section in collaboration with the Human Toxicology Speciality Section is running a symposium entitled “Ageing, Frailty and Multi-morbidity: medical challenges, current interventions, future solutions”. This is a hugely important and very topical issue, as outlined below.**

The number of people aged 65 and over is predicted to double in the next 50 years. Age is the main risk factor for many diseases such as heart attacks, stroke, and diabetes. The aging of the world’s population and its increasing longevity during recent decades has induced profound changes in the world’s political and economic landscape and presented many challenges to health and social care systems.

According to Eurostat, the older population (>65 years of age) in the European Union is expected to grow to approximately 141 million by 2050. The very elderly (>85 years) constitute the fastest growing subset. Older people differ from children and adults of younger or middle age with respect to an increased prevalence of gradually declining human organ and body functions, resulting in physical, physiological and/or cognitive impairments, multi- and co-morbidities, and/or frailty. As any such impairments may start at a different chronological age, occur in different orders, and worsen in different rates, older people of the same chronological age can be quite different (e.g. healthy, facing some minor impairments only, frail).

With the burgeoning social and healthcare implications of an ageing population, investment in understanding the biology of ageing and developing treatments for age-related diseases is increasing. Although age is the main risk factor for many diseases, there is an important and expanding research focus on healthy ageing and understanding the biology of the normal ageing process and the influence of factors such as nutrition and epigenetics on improving lifelong health.

People age at different rates. As stated above, because chronological age does not necessarily reflect biological age, the health status of older adults varies from fit to frail. The concept of frailty, which is a state of increased vulnerability to adverse health outcomes relative to people of the same age, was developed to explain the heterogeneity in clinical outcomes between older patients. Frailty is a major health care problem, as frail individuals have higher mortality and worse outcomes and use more health care services than fit people. Preclinical studies have begun to identify promising new interventions that can increase lifespan and healthspan in animal models. However, whether these interventions can attenuate frailty is not known, in part because until recently, frailty has not been evaluated or quantified in animal models of aging.

In this symposium there will be consideration of investigations that have attempted to address the issue of frailty in animal models. Some studies have used skeletal muscle weakness or sarcopenia as a surrogate for frailty in aging animals. Others have used genetically altered mice, in which components of human frailty such as inflammation are enhanced. In this symposium there will also be consideration of a novel approach to quantify frailty with a ‘frailty index’ based on deficit accumulation in aging animals. The concept of the frailty index is well established in the clinical literature, but recent work suggests that this approach can also be used to measure frailty in aging animals. The ability to quantify frailty in animals is a major step forward in the effort to understand the biology of frailty and to develop new clinical interventions.

There are four speakers who are internationally recognised as experts in this field who will share their knowledge and expertise in this increasingly important area. All BTS members are invited to attend.

Henry Stemplewski  
Chair, Regulatory Toxicology Speciality Section