

Great oaks grow from small acorns: Oncology is committed to doing its part for sustainability

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Sustainability will be at the heart of many discussions at the [ESMO Congress 2022](#), as illustrated by the new results and initiatives spanning cancer prevention, early detection and treatment that were announced today during the opening press conference to the annual meeting of the international oncology community taking place 9-13 September in Paris, France.

"By definition, sustainability is about being able to maintain important, high-quality processes over time. In oncology, seeing the rise in cancer cases, we need to ask ourselves how we can make sure the essential process of caring for patients can be maintained," said ESMO President Prof. Solange Peters. "Sustainability encompasses the notion of avoiding degradation, meaning that we also have to look at maintaining the quality—which, in cancer, includes the availability of and access to anticancer drugs. It also includes quality of life, which is still dependent on the environment, and as ESMO we need to start looking at the [environmental sustainability](#) of everything we do."

Underscoring the multifaceted nature of sustainability as a societal goal, [late-breaking results](#) to be presented at the ESMO Congress 2022 offer a deeper understanding of the long-established link between air pollution and [non-small cell lung cancer](#) (NSCLC) arising in people who have never smoked, and make clear the link between climate change and [human health](#). "Pollution has a known association with lung cancer, but

we didn't know if and how it directly causes the disease," said study author and ESMO 2022 Scientific Co-Chair Prof. Charles Swanton, the Francis Crick Institute and Cancer Research UK Chief Clinician, London, UK, explaining the background to this work.

The research, based on human and laboratory studies, showed for a population of nearly half a million people living in England, South Korea and Taiwan that exposure to increasing concentrations of airborne particulate matter (PM) 2.5 micrometers (μm) in diameter was linked to increased risk of NSCLC with mutations in the EGFR gene, which are known to be present in about half of people with lung cancer who have never smoked. In laboratory mouse models, the same pollutant particles (PM_{2.5}) were seen to directly cause lung cancer by acting through lung tissue inflammation, driving the release of a molecule known as interleukin-1 β that causes epithelial cells to transdifferentiate into cancer stem-like cells. In the presence of mutations in EGFR and in another gene linked to lung cancer called KRAS, these cells can then bloom into a tumor.

"These mutations can be found in over half of normal lung tissue biopsies and are a natural process of aging. They are necessary, but not sufficient to drive cancer: it is in combination with pollution that the cancer stem cells can expand and initiate a tumor. This begins to explain how environmental carcinogens that don't induce DNA mutations can drive cancer," said Swanton, deriving from this discovery a public health mandate to lower the levels of these pollutants, which are produced by the combustion of fossil fuels. "We have to achieve a 50% reduction in greenhouse gas emissions by 2030, and by doing so we will naturally reduce levels of PM_{2.5}. We can all play a part here: we need to cycle more, walk more. It's worth bearing in mind that PM_{2.5} cause 8 million deaths a year, not just due to cancer but also to other diseases like [cardiovascular disease](#), strokes, dementia—that is more than the deaths caused by tobacco globally."

In light of the fact that his research confirmed the blockade of interleukin-1 β could inhibit [lung cancer](#) initiation by blocking the pollution-induced transformation of airway cells into [cancer stem cells](#), Swanton also suggested that targeting interleukin-1 β should be further explored in the future as a potential new approach to [cancer prevention](#).

The findings come in a context where the global incidence of respiratory cancers is on the rise, with annual new cases expected to jump by about 70% over the next two decades. In Europe alone, similar trends observed for other malignancies could result in an increase in overall cancer mortality, from 2 million annual deaths in 2020, to as many as 3 million by 2040. As up to half of all cancers are thought to be preventable, prevention is considered by the World Health Organization to be the most cost-effective, and thus the most sustainable, long-term strategy for cancer control.

"The ESMO Vision 2025, made very clear that if we want to succeed in tackling cancer, we need to develop a clear plan for primary and secondary prevention, continue to offer the optimal care for cancers that cannot be prevented and adequately support cancer survivorship. Focusing on only one of these areas and neglecting the others would lead to failure," said ESMO Director of Public Policy Dr. Rosa Giuliani.

In line with the Society's commitment to promoting research-based cancer prevention, the ESMO representatives joined European Oncology Nursing Society (EONS) Executive Board member Dr. Lena Sharp, Regional Cancer Center, Stockholm, Sweden, in announcing the launch today of the Cancer Prevention across Europe Campaign (PrEvCan).

Led by EONS with ESMO as key partner alongside other international organizations, the campaign will over a one-year period dedicate each month to promoting and explaining the scientific evidence for each one of the 12 recommendations of the European Code Against Cancer

(ECAC) to prevent the disease, starting in October with smoking as one of the most important cancer risk factors.

"What is new here is that it is the cancer care workforce leading the way," said Sharp, the PrEvCan project leader. "We are the ones who meet patients and their families, so we could intervene on a daily basis supporting and advising people to adopt healthier lifestyles to reduce the risk of new cancers but also to reduce negative effects on the current disease."

The campaign will target the general public, including the most vulnerable groups who can be difficult to reach with health promotion and lifestyle advice, but equally [healthcare professionals](#), who according to Sharp can also take a more prominent role in supporting vaccination and screening programs.

The ESMO President added: "We thought for a while that prevention should be in the hands of family doctors, but then we started to learn that preventing the disease must be at least partly in the hands of the specialists of a specific disease, in order to convince people about its importance. Particularly after COVID, a certain degree of suspicion can happen in medicine. You need to make sure that everything you propose has a basis—and one of these bases for cancer prevention is the burden of cancer, what it represents not only in terms of lost years of life but also in terms of the sustainability of our societies and healthcare systems." Peters further highlighted that oncologists should view prevention as an integral part of oncology care, also because the science of prevention still requires more data.

For cancers that are not currently avoidable, screening and early detection has the potential to both maximize individuals' chances of survival, and alleviate the burden on health systems by reducing the proportion of patients with advanced disease who require costly, chronic

therapies and care.

A [study](#) to be presented at this year's Congress could lead to a major paradigm shift in this field, having confirmed the feasibility of multi-cancer early detection (MCED) blood testing as a method of screening for up to 50 different cancer types simultaneously.

"This is one of the very first studies where the detection of cancer DNA in the blood has allowed us to detect cancer at an early stage," said ESMO 2022 Scientific Co-Chair Prof. Fabrice André, Institute Gustave Roussy, Villejuif, France. "If this test works, in the future, it will be good news for patients, but most cancer centers are not equipped to scale up surgeries for hundreds more patients with, say, early-stage pancreatic cancer. With this landmark study comes a need for a wake-up call for hospitals to see what will happen in 10 years and start now to train fellows and change their infrastructures accordingly."

Highlighting the time and patience required to turn promising research results into meaningful innovation for patients, Swanton observed: "ESMO 2022 is a celebration of the collaboration between basic scientists and healthcare professionals to advance care for our patients. Some of the breakthroughs that will be discussed over the next four days have come from biological studies of worms, yeast, bacteria and plants—but they took 30 or 40 years of painstaking science from the bench to the bedside. We need our funders to recognize that and to sustain investment in discovery research to generate the medicines of the future."

Among other highly anticipated results to be presented at the ESMO Congress 2022, André drew attention to several examples of novel approaches which could soon become a reality in the clinic: from the phase III trial of gamma secretase inhibitor (GSI) nirogacestat, a first-in-class drug targeting a new molecular alteration in a rare category of

cancers known as desmoid tumors, through a landmark trial of cell therapy using tumor-infiltrating lymphocytes (TILs) to improve the outcomes of patients with advanced melanoma, all the way to several late-phase trials of immunotherapy, including for non-small cell lung cancer patients not eligible to standard platinum chemotherapy. André welcomed the presence of studies for underrepresented patient populations in the Congress's scientific program, concluding: "We cannot exclude patients from clinical trials."

In closing, ESMO 2022 Press Officer Dr. Antonio Passaro called for a wide and wise dissemination of the data to be presented: "We have here a community of about 25,000 people, with more than 1,900 abstracts and 76 LBAs that will be presented in the coming days. We need to pass these messages to all of our colleagues and the public in order to dramatically improve the future of our patients, which risks being worse than it is today considering current [cancer](#) incidence trends."

More information: BA1 'Mechanism of action and an actionable inflammatory axis for air pollution induced non-small cell lung cancer in never smokers' will be presented by Charles Swanton during Presidential Symposium 1 on Saturday, 10 September, 16:30 to 18:00 CEST in Paris Auditorium. *Annals of Oncology*, Volume 33 Supplement 7, September 2022

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