

## Focusing on the cell biology of cancer

**This month, we launch a series of specially commissioned review and perspective articles on cancer cell biology, covering key topics and recent advances in understanding the cellular mechanisms underlying cancer.**

Cancer is a disease of deregulated cellular behaviour. Acquisition of oncogenic attributes, loss of tumour suppressive functions, evasion of physiological tissue architecture and interactions with the cellular microenvironment enable malignant cells to escape the mechanisms of normal cellular homeostasis in an organism. Cancer cells are therefore able to sustain unlimited proliferation, to thrive under conditions that preclude normal cell survival, and to spread to distant sites through the process of metastasis.

We are pleased to introduce our Series on Cancer Cell Biology, which launches this month with a Review by [Muller and Vousden](#), discussing the mechanisms through which p53, a key tumour suppressor frequently lost in cancer, is able to promote tumorigenesis when harbouring certain mutations. This piece will be followed next month by another Review, in which Cédric Blanpain will present recent advances in tracing the cellular origins of cancer using genetic mouse models. In subsequent issues, we hope to bring to you articles offering unique perspectives on the breakthroughs and challenges in understanding the role of cancer stem cells in tumour propagation, on the effects of post-transcriptional regulation of gene expression to promote or suppress tumour progression, and on the significance of the interactions of cancer cells with their microenvironment. This article series does not aim for comprehensive coverage of the vast and complex field of cancer cell biology. Rather, we hope to stimulate our readership with a number of articles highlighting topical and emerging issues in this area of research, and to mark our strong commitment to covering cancer cell biology.

This expansive field of study includes the mechanisms underlying tumour initiation and progression, and the acquisition of tumour-promoting properties by cancer cells, such as deregulated cellular signalling and proliferative, survival and invasive attributes. *Nature Cell Biology* has published several papers addressing some of these broad themes. Here, we take the opportunity to discuss the scope of cancer biology papers in our journal.

Traditionally, a major focus of basic cancer research has been the study of the regulation and function of tumour suppressors and oncogenes that drive cancer formation when lost or activated, respectively. Delineating the signalling pathways that, when subverted, provide cancer cells with a proliferative advantage or allow them to evade cell death and tumour suppressive processes, remains a focal topic of research and a key point of interest for this journal. Furthermore, the use of mouse genetics has been instrumental in modelling human cancers and in uncovering their cellular origins. Understanding how cancer is initiated and propagated by identifying and characterizing the cell of origin

and cancer stem cell populations of different cancer types, and by providing mechanistic insights into the processes underlying tumour formation and development, are some of the rapidly advancing fields that are covered by *Nature Cell Biology*.

Recent years have seen increased interest in how cancer cells reprogram their metabolism to support growth and survival, for example, by switching their energy production towards glycolysis even in the presence of oxygen, a phenomenon known as the Warburg effect. The roles of cellular homeostasis and stress response pathways in exerting pro- or anti-tumorigenic effects are also under intense investigation. For example, the catabolic process of autophagy can either suppress or promote tumorigenesis depending on environmental conditions or cellular context. Unravelling the metabolic adaptation mechanisms employed by cancer cells and the context-dependent effects of processes such as autophagy are fascinating topics within the scope of this journal.

Another active field of research and of keen interest to *Nature Cell Biology* pertains to the control of cancer cell plasticity, migration and invasion, processes that allow cancer cells to escape the confines of the primary tumour and to colonize distant sites during metastasis. The ability of tumour cells to survive and proliferate at the primary or metastatic tumour site is intimately linked to their surroundings. Thus, revealing the interactions of cancer cells with normal cells and other components of the tumour microenvironment is crucial to understanding the basis of disease initiation, maintenance and progression.

*Nature Cell Biology* aims to be a forum for papers that employ robust models and provide mechanistic insight into fundamental questions in cancer cell biology. Nearly all our cancer biology papers contain validation of key findings using *in vivo* models. However, although we acknowledge the importance of clinical validation, and despite many of our publications providing a certain degree of such analyses, inclusion of human patient data is not currently a *Nature Cell Biology* requirement. In the same vein, although we appreciate the value of therapy-oriented, translational studies, such findings are further removed from the core cell biological scope of this journal.

We hope that the themes highlighted here underscore our commitment to publishing strong cancer biology papers and have helped to clarify the scope of *Nature Cell Biology*. Later in the year, the pieces in this series will be hosted on a dedicated section of the *Nature Cell Biology* website and will be accompanied by a collection of cancer research papers published in *Nature Cell Biology* and other *Nature* journals. We thank our authors and reviewers for their contribution, and hope you enjoy these articles.