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Editorial

Introduction to the Biochemical Pharmacology special issue on targeted cancer therapy☆

Statistics from the American Cancer Society (www.cancer.org) indicate that the average person has a 1 in 2 chance of developing cancer, making cancer the second leading cause of death in Western Society. Biomedical research now stands at an interesting crossroad in the history of cancer therapy. Previous strategies, aimed at the indiscriminate killing of rapidly dividing cells, are beginning to be replaced by more selective approaches that specifically target the genetic changes responsible for tumor initiation and progression. If this field continues to advance as anticipated, a future can be foreseen where cancer therapies are personalized to the individual patient, allowing for maximal therapeutic benefit with minimal off-target effects.

Many of the novel therapeutic approaches currently under development are a direct result of the "oncogene revolution" that occurred in the 1980s, which led to the identification of the genetic mutations necessary for malignant transformation. These mutations typically occur in the receptor tyrosine kinases (RTKs), such as *c-KIT* (GIST), Bcr-ABL (chronic myeloid leukemia), the epidermal growth factor (EGF) receptor (colorectal carcinoma, some sub-groups of lung cancer), as well as GTPases, e.g., *KRAS* (colon carcinoma, lung cancer) and serine/threonine kinases *BRAF* (melanoma, thyroid cancer, colorectal carcinoma) [1–3]. Now, several years later, there is evidence that impressive clinical responses can be achieved, provided the correct oncogenic mutations are targeted. The c-KIT/Bcr-ABL kinase inhibitor imatinib has become the standard of care for unresectable gastrointestinal stromal tumors (GIST) and chronic myeloid leukemia (CML) [4]. Similar encouraging results have also been observed when mutated *BRAF* is targeted in melanoma [5] and Hedgehog signaling is inhibited in patients with medulloblastoma [6].

Since the initial success of imatinib there has been a huge volume of research into targeted cancer therapies. As these studies have involved the work of many scientific disciplines, covering everything from organic chemistry to clinical trials, the literature has been often scattered and difficult to manage. This special issue of *Biochemical Pharmacology* provides a focused overview of what has been achieved in the first decade of targeted cancer therapy and provides a forum to identify challenges for the future. The scope of this special issue has been deliberately broad and addresses the role of targeted therapy in current oncology practice, the identification of novel cell signaling pathways involved in tumor progression and the development of new kinase inhibitors, as well as covering the technical issues of productively using genetic, proteomic and imaging techniques for patient selection.

This is an exciting time in the field of targeted cancer therapy with the ability to look forward to a future where these novel treatments can have a major impact on the lives of cancer patients without a reduced impact on quality.

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Keiran S.M. Smalley[abc*]
[a]*The Department of Molecular Oncology, The Moffitt Cancer Center & Research Institute, 12902 Magnolia Drive, Tampa, FL 33612, United States*
[b]*The Department of Cutaneous Oncology, The Moffitt Cancer Center & Research Institute, 12902 Magnolia Drive, Tampa, FL 33612, United States*
[c]*The Department of Integrated Mathematical Oncology, The Moffitt Cancer Center & Research Institute, 12902 Magnolia Drive, Tampa, FL 33612, United States*

*Correspondence address: The Department of Molecular Oncology, The Moffitt Cancer Center & Research Institute, 12902 Magnolia Drive, Tampa, FL 33612, United States.
Tel.: +1 813 745 8725; fax: +1 813 745 4384
E-mail address: keiran.smalley@moffitt.org (K. Smalley)

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