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Editorial

Nicotinic acetylcholine receptors as therapeutic targets: Emerging frontiers in basic research and clinical science—Editorial Comments

Nicotinic acetylcholine receptors (nAChRs) have been a target for research and drug discovery efforts for the past several decades with initial interest focused on selective agonists and antagonists with more recent activities dedicated to the identification of allosteric modulatory mechanisms. The latter has added to the complexity of both the medicinal chemistry and the pharmacology of this family of ligand-gated ion channels.

Different nAChR subunit combinations have been studied for their functional roles in the nervous system, including modulation of neurotransmitter release, neuronal processing during development and activation of biochemical signaling processes relevant to a wide diversity of pathophysiological conditions. More recently, interest in non-neuronal cell function including aspects of cell growth control and modulation of immune function has emerged.

In 2007 and 2009, *Biochemical Pharmacology* published special issues on nAChRs as therapeutic targets covering aspects of both basic research and clinical advances. Several of the contributors to these special issues also participated at the Society for Neuroscience (SfN) satellite symposiums, "Nicotinic acetylcholine receptors as therapeutic targets: Emerging Frontiers in Basic Research and Clinical Science", held in San Diego, CA and Chicago, IL, respectively.

In 2011, another special issue of *Biochemical Pharmacology*, the one presently in hand reflect the 3rd satellite symposium, which is being held in conjunction with the SfN Meeting in Washington, DC, from November 9–11th, 2011. Articles in this Special Issue reflect the latest concepts in the basic science of nAchR research ranging from pharmacological manipulation of nAChR signaling and downstream mechanisms to the development of novel nAChR-selective tools targeting select receptor subtypes.

In parallel with the advancement in nAChR biology, drug discovery efforts over the years have resulted in the clinical advancement of a number of compounds that exhibit varying ranges of subtype selectivity and target interaction profiles.

Beyond varenicline, which was been approved for the treatment of smoking cessation, a number of nAChR ligands are being evaluated in the clinic for indications that include Alzheimer's disease, schizophrenia, depression and pain. The increase in the number of compounds being advanced to the clinic is a reflection of the therapeutic potential of this family of ligand gated ion channels. In the process, it is critical to assess the clinical trial outcomes in the context of elaborating on basic research findings, and the challenge as to whether assumptions from these remain valid clinically. We hope that the satellite meeting, along with articles covered in this special issue, will provide a forum for such discussions and fresh ideas for research that will form the basis of the 4th meeting in 2013.

The Guest Editors sincerely thank the authors for their contributions and timely submission of articles that have made this special issue possible. We are very much indebted to Lynn LeCount, Cindy Martin, Mike Williams and the Elsevier staff for their constant support and guidance for bringing this issue together.

This special issue is dedicated to the memory of the late Jerry Buccafusco (1949–2010) for his many scientific contributions to the nAChR field, which are highlighted in an article by his close friends and colleagues, Alvin Terry and Mike Decker this issue of *Biochemical Pharmacology*. The nAChR research community has sustained a significant loss with his untimely passing, and his passion for nAChR research will be sorely missed.

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