# Jean-Pierre Changeux

**Professor Emeritus at the Institut Pasteur; Honorary Professor at the Collège de France**

## 2001 Balzan Prize for Cognitive Neurosciences

*Professor Changeux's broad and profound contribution ranges from the fundamental molecular mechanisms of chemical communication in the nervous system to learning and consciousness. In addition to his outstanding experimental work, Professor Changeux has made a theoretical contribution on the epigenesis of neuronal networks by selective stabilization of developing synapses and on several aspects of cognition. Jean-Pierre Changeux has established a new direction for the study of cognitive functions by rooting them at the molecular level.*

**Institution Administering Research Funds:** Institut Pasteur

**Adviser for the Balzan General Prize Committee**: Nicole Le Douarin

## Neuronal Organization of the Brain and Cognitive Functions

In his research, 2001 Balzan Prizewinner in Cognitive Neurosciences Jean-Pierre Changeux was mainly concerned with the study of the correlation of cognitive functions and the molecular aspects of cerebral activity. His laboratory was the first to activate the genes of neuronal nicotinic receptors and to study the consequences they might have on human behaviour. Jean-Pierre Changeux used the second half of his Balzan Prize to continue and diversify this research at the Récepteurs et Cognition unit of the Institut Pasteur. General overviews of this research are contained in a book (Jean-Pierre Changeux and Stuart J. Edelstein, *Nicotinic Acetylcholine Receptors: From Molecular Biology to Cognition*, Paris-New York: Editions Odile Jacob, 2005) and in a recently published article (Jean-Pierre Changeux, Nicotine addiction and nicotinic receptors: lessons from genetically modified mice, *Nature Reviews Neuroscience*, 11 June 2010). In this article, Professor Changeux reviews studies in transgenic mice that have started to reveal which nicotine receptor subunits mediate the effects of nicotine on behavior, cognition and addiction, thus forming therapeutic targets for nicotine addiction.

**Researchers:**
Nicolas Champtiaux
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**Main Publications:**

Changeux J-P, Edelstein SJ. 2005. Nicotinic Acetylcholine Receptors: From Molecular Biology to Cognition. Paris-New York: Editions Odile Jacob.

Changeux J-P. 2010. Nicotine addiction and nicotinic receptors: lessons from genetically modified mice. Nature Reviews Neuroscience.

**Other Publications (in chronological order):**

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Gisiger T, Kerszberg M, Changeux J-P. 2005. Acquisition and Performance of Delayed-response Tasks: a Neural Network Model. Cerebral Cortex. 15 (5).

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Grutter T, Prado de Carvalho L, Dufresne V, Taly A, Fischer M, Changeux J-P. A chimera encoding the fusion of an acetylcholine-binding protein to an ion channel is stabilized in a state close to the desensitized form of ligand-gated ion channels. 2005. Comptes Rendu Biologie. Vol. 328, Issue 3.

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