

Jean-Pierre Changeux

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 stabilisation 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.

Neuronal Organization of the Brain and Cognitive Functions

Institut Pasteur

Adviser for the General Balzan Committee: Nicole Le Douarin

In his research, 2001 Balzan Prizewinner in Cognitive Neurosciences Jean-Pierre Changeux is 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 in a book (Jean-Pierre Changeux and Stuart J. Edelman, *Nicotinic Acetylcholine Receptors: From Molecular Biology to Cognition*, Editions Odile Jacob, Paris-New York, 2005) and in a recently published article by (Changeux, J.-P., *Nicotine addiction and nicotinic receptors: lessons from genetically modified mice*, "Nature Reviews Neuroscience", 11, June 2010). In this article, 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.

Other Publications (in chronological order):

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Statement by the Prizewinner: *J'aimerais souligner, pour conclure, qu'une recherche aussi difficile et contraignante ne peut être le fait d'un homme seul. Ma gratitude est immense pour l'Institut Pasteur, le Collège de France, le CNRS, l'Association Française contre la myopathie, pour tous ceux dont le soutien matériel a, tout simplement, permis à ce travail d'être accompli. Mais, la recherche est d'abord une aventure humaine, une œuvre collective. Je ne puis mentionner ici tous les étudiants, postdoctorants, collègues qui ont participé au travail pour lequel je reçois ce Prix. Qu'ils sachent que c'est aussi à eux que je le dois. Je suis particulièrement reconnaissant à la Fondation Balzan d'avoir reconnu ce rôle en aidant ces jeunes dans la recherche future. L'avenir leur appartient. Le champ de la neuroscience cognitive est immense, comme notre volonté de progresser dans sa compréhension. Jean Pierre Changeux (Berne, 09.11.2001)*