Integration of the molecular Genetics and Engineering to Accelerate Restructuring the Rehabilitation Medicine

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Those who are involved in medical treatment and rehabilitation often see someone who moves an arm, diagnosed as being impaired or paralyzed, with the other healthy hand. That is tantamount to a kind of PASSIVE EXERCISE by a physiotherapist, except that the beneficial effect of such movement would be enhanced. However, it is rather impossible to move a paralyzed leg by one’s healthy hand due to inconveniency and the sheer weight of a leg, i.e., the load would be too much.

The question arises of what effect is to be expected when the patient would be able to move his own paralyzed leg. That question has been the starting point of our cooperative research in medicine and engineering devoted to medical rehabilitation. A simple device has been designed in Japan to perform such moving of a paralyzed leg by the other healthy one. Since then, I have participated in this research and have been searching for the underlying physiological mechanisms of the beneficial effects. The effects of such self-training apparently consist of a boost to cerebral function due to enhancement in cortical blood flow.

Rehabilitation of a paralyzed patient with PASSIVE EXERCISE performed by a physiotherapist has been done for years. However, the nature of impairment basically persists basically unchanged. To improve the present state of rehabilitation by seeking the physiological underpinnings of a handicap we propose that molecular genetics could contribute to the automation of diagnosis or judgment of medical results obtained. That could be achieved by cooperative research efforts in the field of medical engineering in rehabilitation. We wish to continue such efforts towards the improvement in welfare of human beings with your attendance of today.