The driving force to generate new neurons in adult mammalian brain

Regulatory cues on both coding and non-coding genomic regions to promote adult neuron production and the diversity

The direct relevance of neurogenesis in the adult mammalian brain to neural function and plasticity, and potentially to some neurological diseases, including Alzheimer's desease, depression and neurodegenerative conditions, is becoming well-established. Therefore, the molecular mechanisms underlying the control of adult neurogenesis have major implications for neurobiology. We have identified an important and surprisingly simple mechanism that triggers adult neurogenesis. The mechanism links intriguingly between genomic coding and non-coding regions including LINE-1 retro-elements, a family of mobile DNA elements that might contribute to neuronal diversification in the adult brain.

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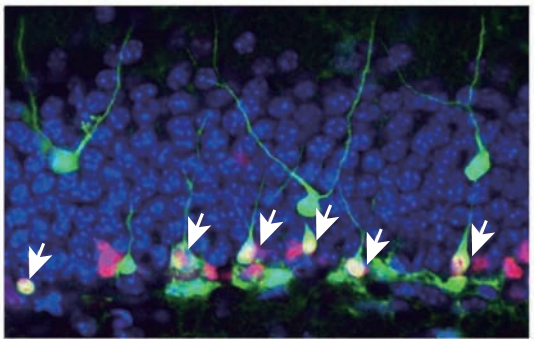
AIST TODAY Vol.10 No.5 p.12 (2010)



In control mice, newborn cells (green) are present among the more differentiated neurons deeper in the hippocampal granule cell layer.

Development of an array analysis system that assesses optimum ligands rapidly

The system is readily applicable to the purification of various antibody drugs

NEDO, Shimadzu Co., AIST, Kyoto Monotech Co., and JBA have jointly developed a protein array system which assesses optimum ligands for purification of various antibody drugs. The protein array is set into a flow-cell [(1)], so that solutions can pass through the inside of the array-matrix. Then UV light is applied to the protein array and transmitted light is monitored by a CCD camera to observe antibody directly without labeling [(2)]. It is observed that UV absorption at each spot increases when an antibody solution is applied, and decreases when an acidic elution buffer is applied, showing antibody binding to ligands and dissociation from ligands [(3)]. Quantified UV absorption at each spot shows that dissociation speed of antibody greatly varies among the ligands [(4)]. So, this array system enables high-throughput analysis of ligands' properties and assessment of optimum ligands for purification. Using this array system, we are attempting to establish methods to improve purification processes for the safe and cost-effective antibody drugs.

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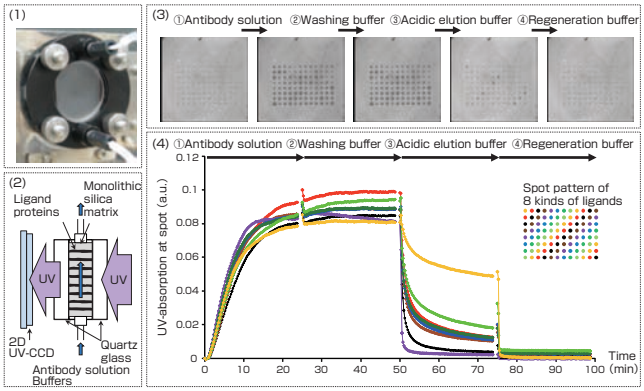
AIST TODAY Vol.10 No.6 p.10 (2010)



(1) The array set in the flow-cell
(2) Mechanism of measurement (side view of array's cross section)
(3) An example of measurement for 8 kinds of ligands
(4) Quantified UV absorption at each spot