

S12-5 **Computer-aided diagnosis and prognosis prediction using multivariate statistical analyses**

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Currently, the nuclear medicine image diagnostic methods such as the single photon emission computed tomography (SPECT) as well as the positron emission tomography (PET) are used for the diagnosis of the brain disease into which regional cerebral blood flow changes such as Alzheimer's disease, Parkinson's disease and etc. Especially in the case of brain disease, the early diagnosis is extremely important for good prognoses. SPECT inspection is one of the effective means which enables us to diagnose such brain diseases faster. Due to the recent development of the mechanical technology and statistical image analysis such as Statistical Parametric Mapping (SPM) and easy Z-score Imaging System (eZIS), abnormal blood flow sites in the images can be found more easily than before. However, these techniques do not provide sufficient information for the diagnoses of the diseases. For example, abnormal blood flow sites, which are obtained SPM, do not identify the diseases. Thus, we tried to develop the new statistical technique for estimations of diseases. We adopted SOM and SVM for analyzing the image data of the patients. Then sufficient prediction power was obtained (80-100%).

In addition, advanced statistical analyses, such as data mining methods, enable us to find novel information on adverse reactions of drugs. We also tried to find valuable information on Stevens-Johnson Syndrome and Lyell's Syndrome, which are severe adverse reactions of drugs.