

## **GENETIC RISK FACTOR PROFILES FOR PREVENTION OF AGE RELATED COGNITIVE DECLINE AND DEMENTIAS**

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A dramatic increase in mean life span and life expectancy, coupled with a significant reduction in early mortality, has led to a substantial increment in the number of elderly population in Western societies. However, also low income countries show a constant increase of dementia incidence. This demographic picture parallels the merging of a new epidemic of dementia, mainly Alzheimer's type in the elderly. Alzheimer's disease (AD) is a heterogeneous and progressive neurodegenerative disease that accounts for the majority of clinical senile dementia and by 2050 the number of patients with AD is expected to rise from 4.6 to 16 millions cases in the USA. Worldwide statistical projections predict more than 45 million of AD patients within the above year. Neuropathological hallmarks of AD are extracellular amyloid deposits (neuritic plaques) and intracellular deposition of degenerate filaments (neurofibrillary tangles). Major clinical manifestations of the disease are memory loss and cognitive impairment. AD is a complex and multi-factorial disease, therefore, it is unlikely that a single biomarker may be determinant in the diagnosis or monitoring the progression of the disease. The population longitudinal study named "The Conselice Study" has been the focus of the present investigation. 65 years old or older participants of this population study on brain aging were followed up for 5 years: 937 subjects completed the follow-up. Relationships of 46 genetic, phenotypic, clinical and nutritional factors on incident cognitive decline and incident dementia cases were investigated. A new statistical approach, called the Auto Contractive Map (AutoCM) were applied to find relationship between variables and a possible hierarchy in the relevance of each variable with incident dementia. This method, based on an artificial adaptive system, was able to define the association strength of each variable with all the others.

The connectivity map related to 46 variables from the Conselice study data base focused upon the AD, prevalent cases during the follow up interval was generated. The map depicts the most relevant associations present in the data base. Gene variants and cognate phenotypic variables showed differential degrees of relevance to brain aging and dementia. A risk map for age associated cognitive decline and dementia will be presented and discussed.