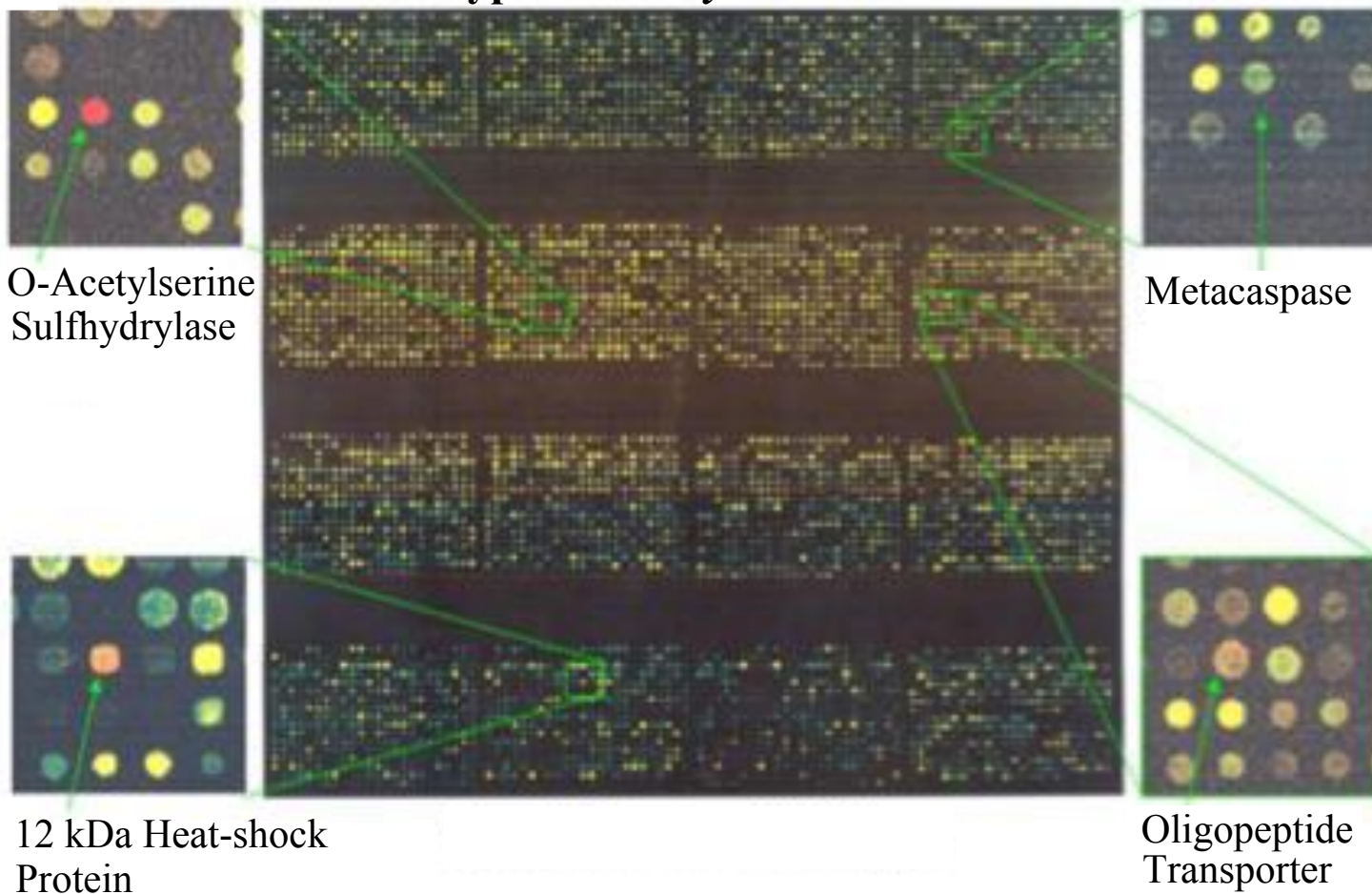


# Science Documents™

## Wild Type *versus* $\Delta yca1$ Mutant Cells



## Yeast Mutant Whole Genome Microarray

## Alzheimer's Disease and Natural Products

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As per the World Health Organization report, dementia will be a global burden soon. Developing countries are spending a huge amount of money for health and medical support to affected people. The prevalence of neurological diseases (e.g., Alzheimer's disease, AD) is continuing to increase worldwide due to lack of the understanding of disease etiology and the causes. AD is characterized by extracellular accumulation of aggregated amyloid- $\beta$  protein, intracellular accumulation of hyper-phosphorylated tau protein, neuroinflammation, and a reduction in cerebral glucose consumption.<sup>1</sup> The prevalence state of this disease in developing countries are not well known or neglected due to lack of awareness, insufficient medical facilities, and religious, social and other cultural practices. Pharmaceutical companies are trying hard to develop an effective drug for AD. Since several clinical trials are underway, the complexity of the disease impedes progress in drug discovery. Now, emerging evidence suggests that insulin resistance could cause AD, which is referred to as Type-3 Diabetes.<sup>1</sup> There is a new strategy in place to exploit pre-approved diabetic drugs in preventing or delaying the occurrence or progression of Type-3 Diabetes like state (AD) due to the insulin resistance in brain. However, there is a bumpy road ahead in finding an effective therapeutic measure for AD.

There was a strong belief from our ancestors that natural food or bioactive compounds from products can act as medicine. Now, this notion has already been accepted by the modern scientist as it is also proven by scientific studies. For example, people with regular intake of a Mediterranean diet could reduce the prevalence of AD as well as other neurological diseases. Interest in the use of natural products in complementary medicine has recently increased.<sup>2</sup> Edible natural products and medicinal plants encompass a variety of bioactive molecules, such as polyphenols, flavonoids and alkaloids, which have potent antioxidant and anti-inflammatory properties. These components have been reported to reduce oxidative stress and inflammation by scavenging reactive oxygen species.<sup>2,3</sup>

Our research group has proven that the long time dietary supplementation of edible natural products such as pomegranate, figs, dates, fenugreek could offer benefit to AD by reducing the amyloid- $\beta$  protein load, improving memory, learning, motor coordination and cognition.<sup>2-5</sup> Further, these products could ameliorate the

toxic effects of free radical generation and neuro-inflammatory responses.<sup>3</sup> These edible natural products offer benefits by means of altering the synaptic dysfunction through their rich antioxidant properties.<sup>5</sup>

Since clinical trials with pharmaceutical drugs are proving to be less effective, the nutraceuticals from pomegranate, figs, dates, fenugreek could offer great protection against AD.<sup>2-5</sup> This could be because of the ability of their components to cross the blood brain barrier and act against neurodegeneration. However, the effects of the individual components of these natural products are not as beneficial as compared with whole product because their efficacy lies in the synergetic effects of the bioactive components. Even though, the beneficial effects in experimental animals and mammalian cell lines are remarkable, there is an urgent need for extensive clinical studies to find the best possible therapeutic strategies for these devastating brain diseases.

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### Conflict of Interest

None.

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