

## Health-Platform End-Points: Application of New High Throughput Screening Technologies

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Functional ingredients identified for health, nutrition and aging platforms are correlated with positive outcomes including cognitive health. Screening of botanical extracts has identified classes of components with positive outcomes including modifications of the microbiome. Traditional broad-spectrum functional extracts contain several active components. Individually these may also act on multiple targets such that overall positive outcomes integrate a variety of underlying mechanisms. EFSA health-related ingredient marketing claims, now require that defined endpoint efficacy be demonstrated and that a plausible mechanistic link be established.

Inherent variability in potency of biological material require measurements of biological efficacy with a strong predictive capacity. Different sage extracts, traditionally used for anti-inflammatory and estrogenic properties, were tested with a proprietary, high throughput screening tool, Chronoscreen™, which integrates outcomes at a whole organism level using a *C.elegans* nematode-based technology. It was configured with an array of endpoints indicative of cognitive health benefits. This enabled quantitative differences to be observed and to rank performance against established pharmaceutical actives.

In response to sage extract administration, gene expression studies allowed identification of up and down regulated genes and their associated pathways. Comparison with responses to Donepezil (a cognitive health therapeutic), allowed identification of differentially expressed genes and potential test dosages for human clinical trial confirmation studies.

Further mapping to human health conditions suggested potential mechanisms of action consistent with neuro-transmitter modulation, longevity, autophagy and lipid homeostasis pathways and a new understanding of the biology of cognitive health.

A human clinical trial was carried out with 4 doses and a placebo given in a single daily dose. Cognitive health end point measurements over a 6-hour period following administration showed a time and dose-dependent significant positive differences with the placebo.

**Conclusion:** This quantitative screening approach showed predictive value for cognitive health performance and suggested potentially unanticipated modes of action.

### Biography:

Joe Hart completed his Undergraduate Biological Sciences (UEA); PhD program (Bacterial plant-pathogen virulence factors at UKC); Post-doctoral research (Secondary-metabolite molecular genetics in lactic-acid bacteria at NIRD, Univ. Reading); lead to microbiome-related role at Nestlé's Swiss fundamental research centre. Across 17 yrs within Nestec's global R&D network, technical/marketing roles: infant nutrition; first validated pet food prebiotic claim; new functional ingredients. Identifying and consolidating ingredient's strategic benefits for Health and Nutrition platforms (human / animal / aquaculture) and production: Joe Hart has an experience in global product management (Danisco's \$35m natural preservatives / probiotics portfolio) and independent, ingredient-related strategic & business development consulting (together totaling 18yrs), and now leading YBM International Ltd. team.