TVP1022 - a Novel Cardioprotective Drug for the Treatment of Congestive Heart Failure (CHF)

Y Barac [1], A Roguin [1], S Kostin [2], J Schaper [2], M Youdim [1], Z Abassi [1], O Binah [1]

[1] *Technion, Haifa, Israel,* [2] *Max-Planck Institiute, Bad Nauheim, Germany*

Background:

TVP1022 is the optical S-isomer of the newly developed, FDA-approved, anti-Parkinson drug rasagiline, which was recently described as "a disease modifying drug" due to its anti-apoptotic and neuro-protective effects. Since: (1) TVP1022 is neuro-protective, and (2) cardiomyocytes and neurons share many similar features, we hypothesized that TVP1022 (which has minimal MAO inhibition), can be cardio-protective.

Materials and Methods:

The therapeutic efficacy of TVP1022 was demonstrated in 2 animal models of cardiac pathologies:

Congestive Heart Failure:

- Volume overload model induced by the placement of a fistula between the abdominal aorta and the inferior vena cava in rats.
- Doxorubicin-induced cardio-toxicity in rats and mice.

Results:

CHF:

- Volume overload - Pre-treatment with TVP1022 **attenuated** the decrease in fractional shortening, remodeling, the hypertrophic response, the increase in BNP levels and the fibrosis.
- Doxorubicin-induced cardiotoxicity - TVP1022 **attenuated** doxorubicin-induced **apoptosis and the decline in diastolic and systolic functions by 50%.**

Conclusion:

The ability of TVP1022 to attenuate cardiac damage induced by different pathological insults, by means of its unique mechanisms of action, being anti-apoptotic, anti-ischemic as well as anti-hypertrophic, render this molecule a potential **cardio-protective drug for CHF patients.**